IMPROVING THE QUALITY OF TRANSITION

in

CENTRAL AND SOUTH EASTERN EUROPE

through

INFORMATION AND COMMUNICATION TECHNOLOGIES

A report for the Department for International Development's Central and South Eastern Europe Department

by

Antelope Consulting

and

Commonwealth Telecommunications Organisation

Contents

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Executive Summary

This report is in fulfilment of the Terms of Reference issued by the Department for Central and South Eastern Europe (CSEED) in DFID on 7th June 2000. Based on desk research and questionnaires, it brings together available information from the region on technical and regulatory structures, and on the social utilisation of the new technologies. The aim is to inform CSEED's decision-making on how Information and Communication Technologies (ICTs) can be introduced and used in a more equitable and inclusive way.

Findings

Central and south eastern Europe[1] has a total population of 130 millions (1999), one third of Western Europe's[2]. The combined size of the telecommunications networks is only 31.9 million lines, compared with 202 million lines in Western Europe. (The UK alone has 30.5 million lines).

The countries of central and south eastern Europe are in general less than half as well served as Western Europe by telecommunications and internet access, and about 5 years behind in terms of regulatory development. For example:

- There are only 25 fixed telecommunications lines per 100 people, compared with 53 per 100 in Western Europe;
- These fixed networks are only around 60% digital, compared with nearly 100% in Western Europe;
- Mobile telecommunications users account for 10% of the population compared with 38% of the population in Western Europe;
- The internet is used by only around 6.5% of the population, compared with, for example, 23% in Germany and 31% in the UK.
- Most of the countries' fixed networks will be opened fully to competition only in 2003, compared to 1998 in Western Europe.

Within these regional averages, there is much greater variation in CSEE than in Western Europe. Telephone density ranges from 3 lines per hundred people in Albania to 37 in Slovenia. In Western Europe, the range is 40 per 100 in Portugal to 68 in Sweden.

There are also wide differences in the geographical coverage of telecommunications (and therefore also internet access). In Western Europe both rural and urban areas have a near 100% network coverage. In central and south eastern Europe, urban coverage is good but rural penetration in is far from complete. On average only 15% of rural households in the region have a telephone line. Romania, Albania and Poland all have several thousand villages with no network access at all.

These large differences in the levels of access and the wide range of country performance are due for the most part to low and varying economic achievement. However, there is a willingness on the part of most of the countries (the only exception being FR Yugoslavia at present) to adopt EU policies in key enabling areas such as telecommunications.

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[1] The central and south eastern European region is defined for the purposes of this report as 15 countries: *Estonia, Latvia, Lithuania, Poland, Hungary, Czech Republic, Slovakia, Romania, Bulgaria, Slovenia, Croatia, Bosnia Herzegovina, Former Yugoslav Republic of Macedonia, Albania, Federal Republic of Yugoslavia.* Figures for Kosovo are included in the FR Yugoslavia.
[2] Western Europe here means the following 17 countries: *Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.*

Our social research revealed that:

- The countries of Central and South Eastern Europe are unequal societies with potential for social exclusion based on socio-economic group, ethnicity, sex and age.

- Unemployment has greatly increased since the end of Communism, seriously affecting many groups, and especially the Roma, whose situation has deteriorated sharply.

- Current use of the Internet tends to be concentrated among the urban, educated (perhaps male) young.

- Governments in the region have policies for the Information Society. In Central Europe, but less so in the Balkans, they have made considerable progress establishing a presence on the web. Interactive services are generally not available however, partly because of a reluctance to move away from paper-based, physically signed and rubber-stamped transactions

- Commercial companies are also responding rapidly to the new technologies, although, with the exception of vanguard software and e-commerce companies (of which most countries have a number), the picture is one of presence on the web rather than e-commerce. This is related to the low number of true credit cards in use in the countries.

- These two factors taken together suggest that the population will have little choice but to embrace ICTs if it wants to interact with government or business and avoid future social exclusion.

- There have been a number of successful schemes to promote public access to the web in more remote areas using telecentres and libraries.

- Telephones have become, and mobile phones are becoming, essential tools for life in the region. There is some indication that this is associated with a reduction in willingness to share access to such technologies.

- Most countries have a corps of highly trained computer professionals who can service the needs of the Information Society.

- There is no reason to think that the population, including the rural population, women and more elderly generations, cannot absorb ICT training. Levels of education and experience in the labour force are generally high, in rural as well as urban areas.

- Our respondents' suggestions of areas for future development include making the Internet more accessible by:
  - Making telephone access cheaper
  - Making electronic payment easier
  - Providing public access points
  - Providing training in ICT skills and the English language

Our survey of the relevant activities of other donors revealed considerable interest in these challenges, and significant funding already channelled towards fulfilling some of the UK Government's goals. However the lion's share of funding is targeted at creating commercial opportunity in the region for Western companies, and much of the rest is still at an exploratory

stage. There is still a need, which may be seen as an opportunity for the UK Government, for intervention towards the fulfilment of non-commercial goals.

Conclusions

Our analysis of strengths, weaknesses, opportunities and threats relating to the use of ICTs in the region points to a clear case for the UK Government to consider intervention in this area.

Strengths and opportunities are remarkable. Compared with other countries of similar income levels, ICT penetration is fairly high and is growing rapidly. The value of ICT is widely recognised, and attitudes towards ICT are open and receptive. The population, enjoying a high standard of education, is generally well-equipped to take advantage of the opportunities offered by the new technologies.

Weaknesses and threats, however, are significant. The proviso of "similar income levels" is a vital one. Income is everywhere significantly lower than in Western Europe, and in the poorer countries is low by world standards. In common with other countries, economic liberalisation is bringing about growth but also growing inequality. Reliance on market forces alone will not deliver the benefits of new technologies to large segments of the population within decades. The widely-recognised potential of ICT to foster economic enterprise and social participation for all will not be achieved in the foreseeable future without intervention. Apart from low income, important barriers to the wider adoption of ICTs include:

▪ The relatively slow application of key regulatory instruments such as universal service funding, cost-based network interconnection fees and e-commerce enabling legislation;

▪ The lack of key skills in the areas of governance and large-scale technology deployment, and its socially valuable application.

Our subjective overall assessment is that taken as a whole the picture is positive – that the strengths and opportunities outweigh the weaknesses and threats. The positive reasons for taking action are stronger than the negative ones – that is, doing nothing and thereby missing the opportunities would be more serious than allowing the threats to develop. The case for intervention is strengthened by the fact that ICT actions often also support other activities already under way. For example, education and health programmes could be more effective, cheaper or both with additional ICT backup. Such actions would also boost the UK's public profile.

We have identified a collection of specific actions in this arena which we believe are worthy of UK Government Departments' consideration because they build on strengths, redress weaknesses, exploit opportunities or address threats that we have identified, and also have one or more of the following characteristics:

• making a significant contribution to poverty reduction, equity and/or social inclusion;

• low cost, or otherwise easy to achieve;

• likely to support the efficiency or effectiveness of other socially valuable activities such as health care or education;

• using skills and experience in which the UK is especially strong.

What, if any, types of intervention may be appropriate for Departments to undertake is a matter for them to decide, in the light of such factors as:

- available budgets and other resources;

- relationships with other international and commercial funders;

- national commercial and public relations objectives;

- synergy (or lack of it) with other regional activities envisaged or already committed.

Potential actions

The actions that we have identified for consideration in this area are divided into three main categories: infrastructure building, skills development and ICT applications. A fourth general category cuts across these three. Plainly, not all actions will be equally appropriate in all countries. In particular, adequate infrastructure has to precede applications using that infrastructure. For example, there is no point making government easily accessible via the Internet unless a substantial proportion of the population will have both Internet access and the skills and confidence to use it for dealings with government.

Infrastructure building

1 Support to regulators for rural telecoms development

Telecoms development in areas which are not of obvious commercial interest (mainly rural areas, but also some poorer parts of cities) is a clear need in the region. The UK has particular expertise in regulatory approaches to support such development.

2 Support telecentre organisations

Multi-purpose community telecentres bring Internet access, and other ICT and office services, to the general public, especially in villages. Hungary and Estonia already have flourishing national telecentre organisations, and the UK could support the formation of similar organisations elsewhere and the spread of best practice.

3 Support libraries as public internet access points

Libraries are already well established as a community information resource, and an extension of this role by the provision of public internet access will seem natural to many. Our short survey has shown that already some authorities in the region are moving in this direction. The British Council's existing involvement in this area should be a good basis for future co-operation.

4 Facilitate development of e-commerce legislation

The UK is well-equipped to support countries wishing to develop enabling legislation for e-commerce, and could thereby gain both commercial and other advantage.

5 Help provide virtual telephony for Roma

Virtual telephony is an "answering machine in the network" which enables people without their own phone to receive personal messages by calling a special number from any telephone. It could offer a form of communications to the Roma, thereby enabling (for example) contact by potential employers.

6 More detailed data on Balkan infrastructure

This desk-based study has revealed little detail about conditions "on the ground" in the Balkans. Given the UK desire to support the revival of this troubled area, a full understanding of its telecoms needs seems a highly desirable early step.

Skills development

7 Enhance commercial awareness of graduates

8 Help to update IT teaching in universities

9 Help to integrate ICT into school curriculum

These three possible actions are all clearly needed in many parts of the region. UK educational institutions have vast quantities of relevant experience and would be well placed to contribute it to help fill the need in CSEE.

10 Promote "English for internet" language training

The British Council's in-country teaching is not currently aimed at helping people to learn the sort of English that they need in order to make better use of the internet. However, the fact that it exists at all is a useful start. With more UK support it could be built upon and re-oriented to help more people exploit more of the assets of the Internet.

ICT applications

11 Roving project team to pilot ICT delivery of public services

There is a long way to go towards the adoption of current best appropriate practice throughout the region. Establishing and then publicising good pilot schemes is probably the best way to demonstrate the potential benefits and economies. The UK has some excellent examples to its credit and specialised expertise to share.

12 Help establish social welfare telephone helplines

Providing advice, support and counselling services over the phone is a good way of getting social value from existing technology. This is an area where the UK appears to have more experience than any other European country.

13 Help civil society organisations connect to Internet

A rapid extension of internet access to all households in CSEE is impracticable. Extending it to the majority of organisations of civil society (such as voluntary groups, consumer organisations and community radio stations) is however a more reasonable goal, and one which could greatly

strengthen these organisations to the general benefit of society. It would enable them to communicate more easily with their peers, to keep up with best practice elsewhere and to promote themselves to the world.

14 Help develop acceptable means of electronic payment

Widely-used electronic payment mechanisms are an essential element in growing electronic commerce. Credit cards are little used in the region, and in any case are not the most appropriate approach for the high-volume, low-value transactions which are more likely to succeed in relatively low-income countries. Alternative forms of electronic cash are being developed in the Western world, but may need adaptation for success in the CSEE environment.

15 Investigate machine translation

Machine translation technology is as yet in an early phase of development. A UK Government Department may wish to look further into the state of the art in order to decide whether it may be worth its while to support either application of existing machine translation techniques to translate English into CSEE languages, or advancement of existing techniques. The latter is a more ambitious goal, but one that could in principle be of value to all regions, not just to CSEE.

General

16 Find commercial partners for some initiatives

This seems a clearly desirable action. To make it more concrete, we offer draft terms of reference for a work package to pursue non-profit sponsorship opportunities. A parallel project could investigate the scope for partnership in projects with a potential profit element.

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We have provided our qualitative assessment of these actions in the following dimensions:

- Support for the goals of poverty reduction, equity and social inclusion (high, medium, low)

- Potential synergy with other initiatives promoting social welfare (high, medium, low)

- Use of UK special skills (high, medium, low)

- Speed of producing an impact (high=short-term, medium=medium-term, low=long-term) (with the terms roughly understood as 1 to 2 years, 3 to 7 years, and 8 years or more).

- Cost (high, medium, low) (assuming the action is carried out across all appropriate countries. Costs can clearly be reduced by acting in a subset of countries; however we recommend acting on a multi-country basis where practicable, especially in the Balkans, to foster cooperation).

Different actions will be appropriate in different countries, depending primarily on their state of infrastructure development. The countries most in need of support in extending their infrastructure appear to be Albania, Romania, the Balkans and Poland.

UK Government's preferred choice from this collection would presumably score high in the first four dimensions and low in the last (cost). Nothing quite achieves this ideal. Our comments on possible choices are:

Numbers 1, 5, 12, and 13 seem to offer high or rapid returns for reasonable outlay and we hope that they will be considered seriously.

Number 4 is likely to be more costly but could be very rewarding.

Numbers 6 and 16 are of an exploratory nature and we recommend that they be undertaken: they are low cost and are likely to be fruitful.

The outcome of number 15 is highly uncertain, but it could have far-reaching results for a low outlay.

1   Introduction

This report is the main deliverable[3] from a scoping study commissioned by DFID's Central and South-Eastern Europe Department (CSEED) in June 2000. The study has been undertaken by two consultancies, Commonwealth Telecoms Organisation (CTO) and Antelope Consulting. Lead consultants for the different parts of the report are identified on the contents page. The conclusions and recommendations are supported by both organisations.

Terms of reference

CSEED asked the consultants to assemble and analyse readily available information on:

- the extent of penetration of information and communication technologies (ICT) in the CSEE region;

- the opportunities and threats posed by this penetration across different socio-economic groups, and the social and technological factors that constrain or facilitate penetration across commercial, residential and civil society users;

- the regulatory constraints which affect the levels of ICT penetration and access in urban and rural areas;

- the extent to which ICTs are considered in domestic policies concerned with the delivery of services such as in employment, social services, social welfare benefits, and education, and the extent to which countries see a need for strategies to encourage and facilitate the use of ICTs for economic and social development and governance;

- the level of expertise and availability of resources in the countries concerned, and the effect of this on the demand for technology-based approaches to development issues, and the capacity for implementing them;

- the approaches and activities of the other international funding organisations in the region in terms of the use of ICTs, and the ways in which DFID and UK actors need to influence these approaches to ensure that they meet the development objectives.

Work undertaken

To meet these requirements, during the months of June and July 2000 we have:

- collected published statistics on ICT penetration throughout Europe, and analysed these to produce an overall picture of how the region compares with Western Europe; findings are reported in the first part of Chapter 2 and Annex A.

- drawn on earlier studies summarising the state of regulation in the region, and supplemented this from existing knowledge and a few specially commissioned case studies; findings are reported in the second part of Chapter 2 and Annex B.

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[3] Other deliverables have been: two interim reports which are now subsumed by this final report, and a briefing note for DFID staff attending a meeting on the Balkans on 7 July 2000.

- distributed a questionnaire to multi-country co-ordinators of the Phare project covering 13 countries in the region. Information from the 6 returned questionnaires (Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Slovakia) is reflected in Chapter 2 and also in Annex D, a Baltics case study.

- reviewed the literature on social divisions and social exclusion in the region; findings are reported in Chapter 3.

- instructed collaborators based in eight countries of the region (Albania, Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovakia) to gather information for us on the basis of an agreed questionnaire. All but Romania have provided substantial input which is reported in Chapter 3 and Annex C.

- distributed a separate, shorter questionnaire to contacts with library expertise in Hungary, Lithuania, Poland, Romania, and Slovenia. Findings appear in section 5 of Chapter 3.

- reviewed (through internet research and remote contacts) the relevant activities of other significant international donors in the region. Findings are reported in Chapter 4 and Annex E.

- met together and with DFID to discuss the findings, their significance and our recommendations. The outcome is reported in Chapter 5.

- produced a final report incorporating DFID's comments on a draft.

Limitations

This adds up to a substantial body of work, but two key limitations must be noted:

- though we have made extensive use of contacts within the region, the consultants themselves have been entirely desk-based. This was in keeping with the short timescale and limited budget for the study. We expect that carrying the work forward will require travel to the region (this is certainly the case for two specific pieces of further work that we recommend).

- we have achieved varying degrees of coverage of the 16 countries in the region. We are best informed about Central Europe (Poland, Hungary, Czech Republic, Slovakia), while we are mainly reliant on published statistics for several Balkan countries (Bosnia, Macedonia, Yugoslavia) and have no separate information on Kosovo. Our information on the remaining countries (the Baltic republics, Slovenia, Croatia, Albania, Bulgaria and Romania) lies between these extremes. The generalisations which we offer in our overview therefore have the status of informed opinion rather than established facts.

Acknowledgments

The consultants would like to thank DFID for commissioning this study, which has proved of considerable interest. We should also thank all our colleagues, especially but not only in CSEE countries, who have provided valuable input to the study – often going well beyond the bounds of duty.

## 2 Technical and regulatory infrastructure

2.1.1 Economic Factors

The 15 countries of the region have a total population of 130 millions (1999) compared with a population of 383 millions in Western Europe[4].

The average per-capita GDP of the 15 countries is $3,148 which is only about 14% of the Western European average of $23,191.

Key Economic Comparisons

A greater number of countries in Central and South Eastern Europe are below average GDP/capita for the region than is the case in Western Europe; -
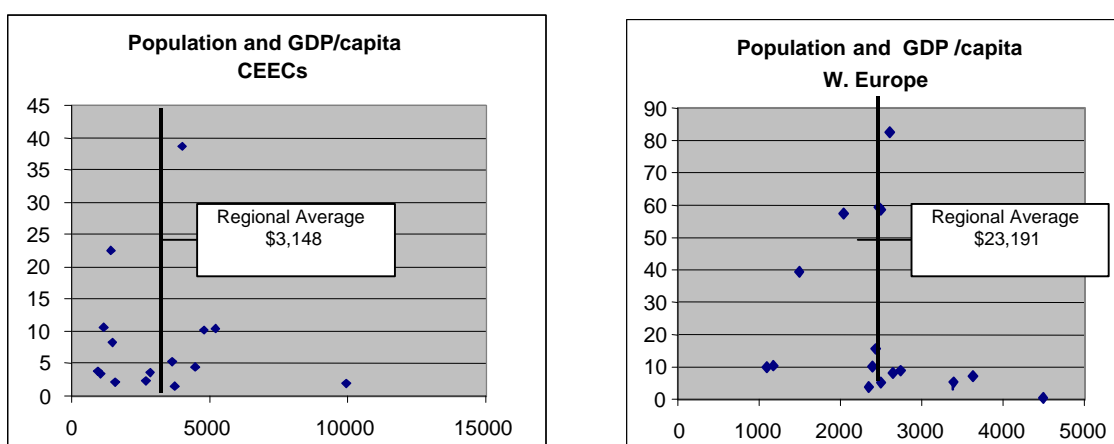
Countries where GDP/capita is below average for their Region; -

Central and South Eastern Europe		Western Europe	
- Bosnia	$931	- Portugal	$10,921
- Albania	$1046	- Greece	$11,752
- FR Yugoslavia	$1182	- Spain	$14,932
- Romania	$1440	- Italy	$20,388
- Bulgaria	$1449		
- FYR Macedonia	$1600		
- Latvia	$2701		
- Lithuania	$2830		

Total population of these 8 countries:
=56.8m (44% of CEEC total)

Total population of these 4 countries:
=117m(30% of Western European total)

(Source: Economist 1999)

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[4] Statistical tables of these and other data illustrated in this chapter are supplied in Annex A.

2.1.2 Fixed Telecommunications Networks

The general relationship between GDP/capita and telephone network penetration (or teledensity – defined as lines per 100 population) in different countries is well known. The following chart combines the countries of central and south eastern Europe with Western Europe. It shows that, for this sample of 32 European countries, all 15 countries of central and south eastern Europe are below the 32 country average GDP/ capita. Of the EU countries, only Spain, Portugal and Greece are below the 32 country average GDP/capita.

Telecommunications take-up is related to wealth

Fixed Network Penetration and GDP/capita in Europe

Average 45.6 per 100 pop.
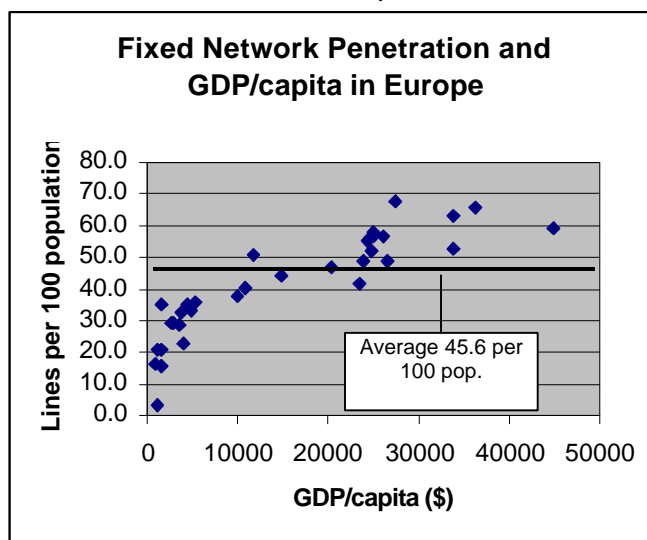
(Source: Public Network Europe 1999)

Countries with fixed network penetration below average for Europe as a whole include all 15 central and eastern European countries, plus Portugal, Spain and Ireland. In the EU, deliberate funding policies have sought to redress this imbalance. For the countries of central and south eastern Europe to reach comparable levels of penetration, then either the economic conditions would have to improve significantly, or some other initiatives directed specifically at penetration would be required. In fact, in several of these countries, teledensity is already significantly higher than would be expected on the basis of world average performance for countries at their level of per capita GDP.

The above analysis has considered each country as a whole. The variances within countries are themselves dramatic, and become more evident when considering the penetration of different telecommunications services in urban and rural areas.

The total number of fixed network lines in the region is 31.9 million, giving 24.6 lines per 100 population. (Fixed network lines are ordinary telephone connections to households and business premises as distinguished from mobile subscribers.) The comparable figures for Western Europe are 201.8 million lines, at 52.7 lines per 100 population. The range of penetration rates for the different countries is far wider in central and south eastern Europe than for Western Europe, as shown below.

Fixed-Line telephone network penetration 1998
(Lines per 100 population)

Teledensity in Central and South Eastern Europe

Average 24.6

15 Countries

Teledensity in W. Europe

Average 52.7
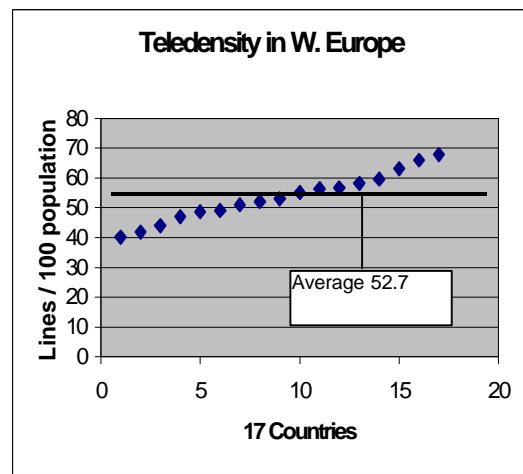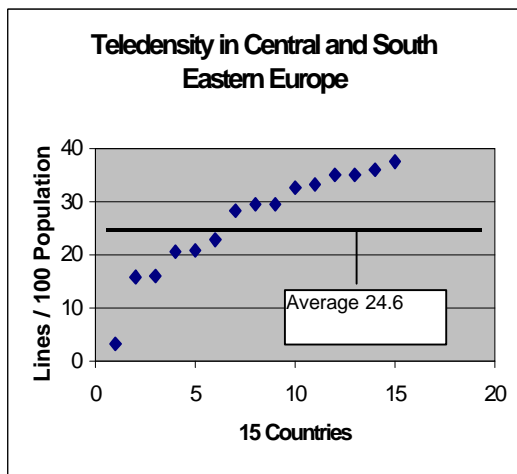
17 Countries

Countries where fixed-line telephone network penetration is below average for their Region; -

Central and South Eastern Europe		Western Europe	
- Albania	3.2%	- Portugal	40.2%
- Romania	15.8%	- Ireland	41.9%
- Bosnia	16.0%	- Spain	44%
- Macedonia	20.5%	- Italy	47%
- FR Yugoslavia	20.8%	- Belgium	48.6%
- Poland	22.8%	- Austria	49%
		- Greece	51%
		- United Kingdom	52%

Total unserved pop. of these 6 countries:
=66.6million (51% of CEEC total)

Total unserved pop. of these 8 countries:
=103m (27% of Western European total)

(Sources: Questionnaires, Public Network Europe 1999)

Some countries are investing heavily in fixed network growth and modernisation. For example in Albania, assisted by finance from EBRD together with the Italian and Swiss governments, the network grew from 87,000 lines in 1997 to 115,000 lines in 1998, raising the penetration to 3.7 per 100 population (a growth rate of 32%). In Poland, telecommunications is also experiencing rapid growth, from a low base in the early 1990's, to become one of the boom industries of the late 1990's. The Polish government has targeted penetration at 27% by 2003 (currently 23%) with 80% digitalisation before 2001 (from 60% in 1998). In Hungary and the Czech Republic also, telecommunications is the most dynamically developing sector of the economy, with annual growth rates of around 10-12%.

The other countries remain relatively sluggish, hampered by low investment, or delays to market liberalisation (see also Section 2.2). Average growth in the region is however strong at 11.8%, which compares well with Western European telecoms operators (for example, BT's domestic network is growing at only 5% p.a.)

Network Modernisation

**Main Lines on Digital Network in
Central and South Eastern Europe**
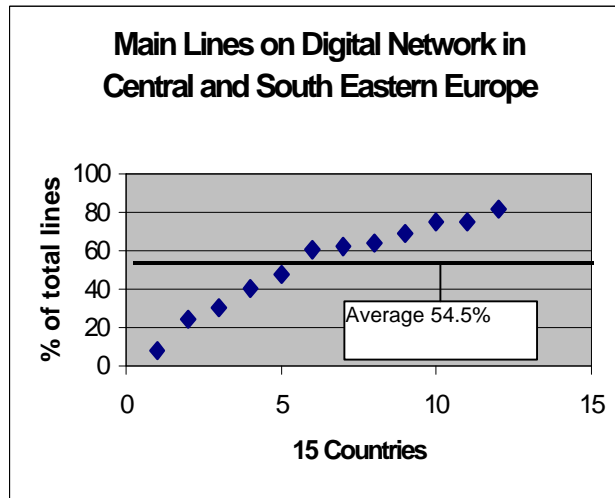
Countries that are below the regional average: -

Bulgaria	8%
Lithuania	24.5%
Latvia	30.4%
Romania	40.6%
Estonia	47.8%

(Sources: Questionnaires, Public Network Europe 1999)

Some countries are experiencing very low growth in fixed network telecommunications, with Latvia actually decreasing at around 0.6% p.a. in 1998. Slovenia, Croatia, FR Yugoslavia, Lithuania and Romania all grew at 5% p.a. or less. This has been due in part to the slower progress in these countries to privatisation, coupled with an investment priority towards national and international system modernisation, rather than towards network growth.

Growth rates of fixed-line telephony

**Fixed Network Growth Rates
Central and South Eastern Europe
1997-1998**
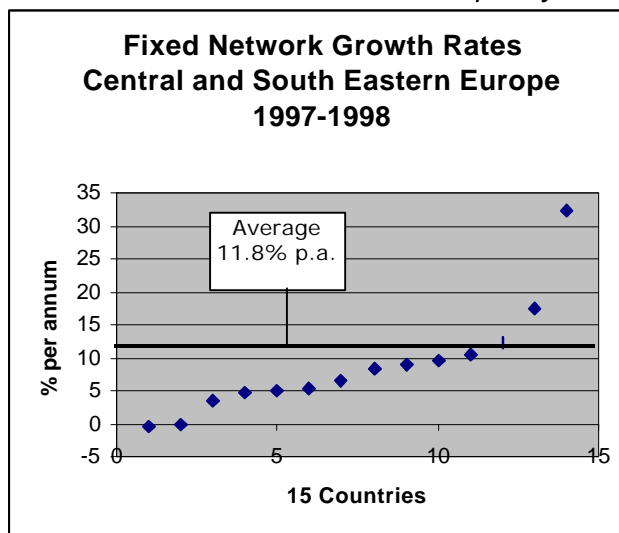
Countries that are below the regional average: -

Latvia	-0.6%
FR Yugoslavia	0.0%
Slovenia	3.4%
Lithuania	4.7%
Croatia	5.0%
Romania	5.4%
Estonia	6.4%
Slovakia	8.3%
Bulgaria	8.9%
Hungary	9.6%
Macedonia	10.5%

(Sources: Questionnaires, Public Network Europe 1999)

There appears to be no direct correlation between low growth rates for fixed networks with high take-up of mobile phones. Although mobile growth is generally strong, and mobile phones can attract customers who are on a waiting list for fixed telephones, there is not a general migration away from the fixed network. Mobile penetration is considered more fully in section 2.4 below.

2.1.3 Rural Penetration

A particularly significant difference in telecommunications penetration between central and south eastern Europe on the one hand and Western Europe on the other is in the extent of penetration in rural areas. In Western Europe, networks reach all locations, and 80-90% of households take up lines. In the more rural parts of central and south eastern Europe, the network will not reach many villages, and in the ones that it does, take-up is much lower. The table below is from data on residential lines per 100 households, which is a more meaningful measure than teledensity (lines per 100 population) when considering personal access to telephony.

Residential Penetration (res lines/100 households)
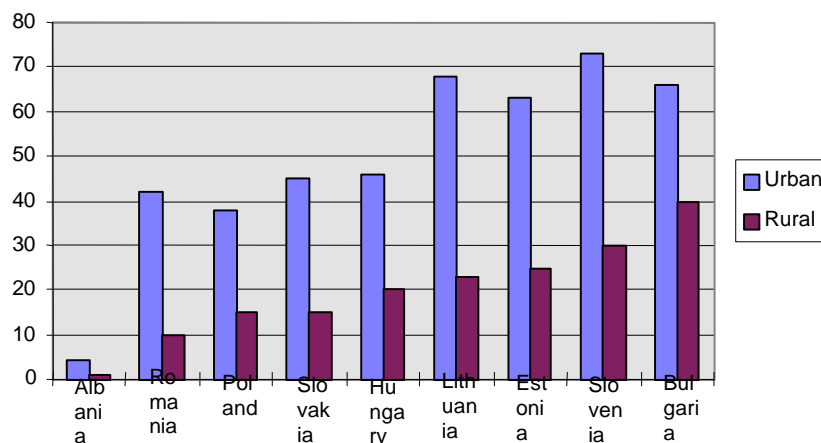
(Source: EC Phare Programme 1998)

Additional regional data from Bulgaria and Croatia (in Annex C) also show considerable discrepancies in telephone penetration between different parts of each country.

The two least served rural countries are Albania, where 1200 villages remain unconnected (43% of all villages) and Romania where around 1700 villages are unconnected (approx. 63% of all villages). Typical village sizes are around 1000 inhabitants in these countries. In Romania, Lockheed Martin Telecommunications of the US is currently constructing a rural telecom system in a $13 million joint venture with RomTelecom (the national monopoly provider), using VSAT (Very Small Aperture Satellite) technology. The services will include a public phone in 4000 towns and villages plus data transmission capability. In Hungary, Motorola is providing 200,000 fixed wireless connections in remote areas, at a cost of $100 million.

Hungary has pioneered the concept of "Tele-cottages" at village level under the *Telehaz* name. Most countries are planning to deploying *WiLL* (Wireless in the Local Loop) technologies in the more remote locations as a means to reduce the high unit cost of serving local communities.

The issue of rural telephony has been studied under the EC Phare programme[5]. In its report, which covered nine countries, the key conclusion was that these countries faced severe challenges in moving their rural telecommunications infrastructures towards EU parity. The main issues are related to interconnection policy and finance. The challenges are similar to those which EU countries have had to face over the funding of universal access, though in dissimilar circumstances. The situation in central and south eastern Europe is more acute and needs a response which is tailored to the requirements of the region and in the context of market liberalisation.

The Phare report on rural telecommunications analysed the various factors contributing to the economic viability of the rural market. It suggested that the following factors (in descending order of impact) could contribute to the attractiveness of the rural market to network investors.

- An increase in per-capita income
- A reduction in interconnect fees to the national operator
- Zero interest loans for capital investment
- Higher domestic tariffs
- Capital cost reduction
- Operating cost reduction

This challenge, to redress the under-penetration of rural areas, is the largest single barrier to the achievement of a more even access to ICTs in the region. Without telecommunications network access to rural areas, whole sections of the population will be denied both basic communications and access to the Internet. It is estimated that around 40% of the population live in rural areas (average over all 15 countries). With a rural network penetration rate of around 18% of households (and 2.5 persons per household) this means that an estimated 18m households are not connected, depriving 44 million people, or 34% of the total population.

The possible regulatory-assisted solutions to this imbalance are discussed under section 2.2 of this paper.

2.1.4 Mobile Communications

Mobile communications is experiencing the same rapid progress as in Western Europe, although from a later start. While Albania, Bosnia, and Macedonia still have monopoly provision, which has

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[5] . Phare Multi-Country Programme for Telecommunications and Posts 1998 report *"Alternative Models for the Development of Rural Telephony"*. Nine countries participated (Albania, Bulgaria, Estonia, Lithuania, Hungary, Poland, Romania, Slovakia and Slovenia) Bosnia-Herzegovina and Macedonia were observers

held penetration back to below 10%, all other countries have issued two or three competing licenses, stimulating high growth rates and penetration. Those countries that have not yet introduced pre-payment schemes for users (Bosnia, Bulgaria, Croatia and Macedonia) have not grown as fast. These factors contribute to a less clear association between penetration and country income, as shown below.

Mobile subscribers now make up 10.1% of the population of central and south eastern Europe, compared with 38.4% in Western Europe. However, as the chart shows, there are again wide differences in penetration rates across CSEE.

Mobile penetration in Europe: some countries defy the fixed network trend
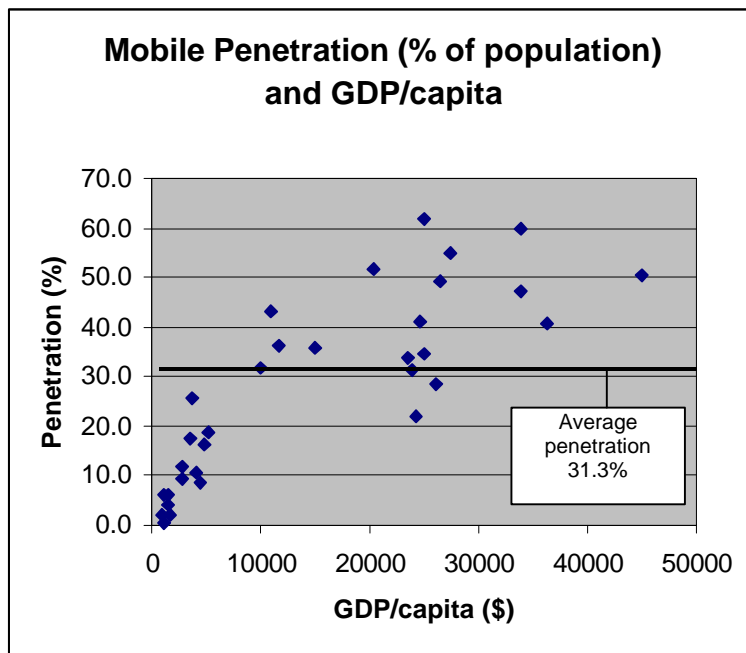
Countries that are below average:-

Central and South Eastern Europe   Western Europe
(all except Slovenia at 31.8%)

Albania	0.3%	Netherlands	22%
Bosnia	1.9%	Germany	28.5%
Macedonia	2.2%	Belgium	31.2%
Bulgaria	4.0%		
Romania	6.0%		
FR Yugoslavia	6.3%		
Croatia	8.7%		
Lithuania	9.2%		
Poland	10.4%		
Slovakia	17.6%		
Czech Rep.	18.9%		
Estonia	25.0%		

(Source: Public Network Europe 2000)

The wider range of mobile network penetration has meant that 2 countries of central and south eastern Europe have now overtaken the lowest penetration Western European country. Slovenia has managed to leap over 3 countries of Western Europe in the mobile penetration stakes and Estonia, leveraged by its proximity to world-leader Finland, has a greater penetration than Netherlands.

18

Success Story – Mobile is growing faster in Eastern than in Western Europe

**Mobile Subscriber Growth - C & SE Europe
(1998 - 1999)**

**Mobile Subscriber Growth W . Europe -
(1998 - 1999)**
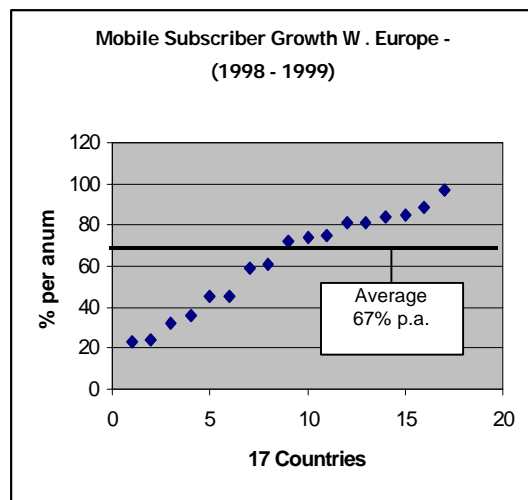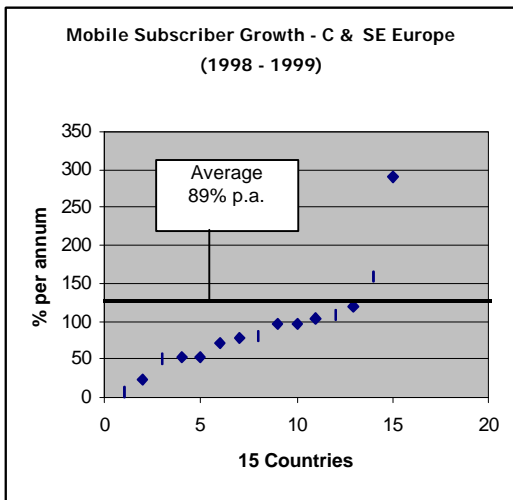
Countries where mobile subscriber growth is below average for their Region; -

Central and South Eastern Europe		Western Europe	
Lithuania	6%	Finland	23%
Macedonia	23%	Netherlands	24%
Estonia	50%	Sweden	32%
Hungary	54%	Norway	36%
Bosnia-Herzegovina	54%	Denmark	45%
Latvia	72%	Italy	45%
Slovakia	78%	Ireland	59%
FR Yugoslavia	81%	Luxembourg	61%

(Source: Public Network Europe 2000)

Mobile operators in central and south eastern Europe sold an additional 6.2 million mobile phones during 1999, compared with Western European sales of 59 million. However, this represented a regional growth rate of 89% in the year, compared with 67% in Western Europe.

Although the population coverage of mobile networks is generally high (for example over 90% of the population in Estonia, Slovakia, Lithuania, Poland, Hungary, Macedonia, Romania, Bulgaria and Slovenia - but only about 60% in Albania), mobile take-up in rural areas is lower than in urban areas. Although no formal data yet exists to make firm comparisons, the buyers of mobile phones tend to be younger, richer, employed urban dwellers.

2.1.5 Waiting lists

Figures for waiting lists have to be treated with caution, for the following reasons:

- In some countries it is not possible even to join the waiting list until some network assets have been provided in the area concerned.
- In many countries waiting lists are maintained by local offices of the telco, and statistical practices may vary between offices, as well as between countries.
- Where there is no prospect of service being provided for some time, there may be little incentive for the telecommunications company to maintain the list in good order. When waiting lists are examined, it is frequently found that many applicants have been given service without having their names removed from the list, or no longer require service for other reasons, for example because of dying or leaving the area. Duplications through administrative errors are not uncommon either.
- Applicants join a waiting list when the price of service seems reasonable to them, or in the expectation that by the time service is offered they will be able to afford it. If however the price of service is increased, some of those on the list may not wish to have a line installed when they are offered it. ("Price" here means a compound of installation price, rental and call charges).
- On the other hand, many potential applicants do not join the waiting list, because they perceive it as futile to do so. For this reason, waiting lists sometimes increase sharply after a telecommunications company launches a network expansion programme, as the programme reduces the perceptions of futility. This suggests that on balance waiting lists are likely to under-estimate true demand, at least before an accelerated investment programme is announced.

With these caveats in mind, it should be noted that waiting lists are still significant in many parts of the CSEE region. The biggest lists are in Poland and Romania, and not simply because these are the biggest countries: the lists reflect the slow rate of investment in telecommunications in these two countries. The biggest lists relative to the number of lines already installed are in Romania, Albania and Poland. The table gives estimates for the waiting lists in the first half of 2000.

Waiting lists, first half of 2000

Country	Estimated waiting list	As % of lines already installed
Albania	70,000 in Tirana area (no waiting list possible elsewhere)	50%
Bulgaria	325,000	10%
Czech Republic	small?	?
Estonia	small?	?
Hungary	small	Less than 1%
Latvia	small	1%
Lithuania	60,000 (not uniform across country)	5%
FYR of Macedonia	50,000	10%
Poland	2 million	20%
Romania	2-3 million	65%
Slovak Republic	100,000	5%
Slovenia	2,500 (certain areas only; no waiting list in most of country)	1%

Source: Various, including company reports

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2.1.6 Internet Usage

Based on recent surveys[6], the number of internet users ranges between 3% and 15% of the populations of the 6 countries surveyed. In this survey, there appears to be no correlation between the number of users and a country's wealth.

Internet Usage in Central and South Eastern Europe

Internet Users (% of population) and GDP/capita

Average penetration 6.5%
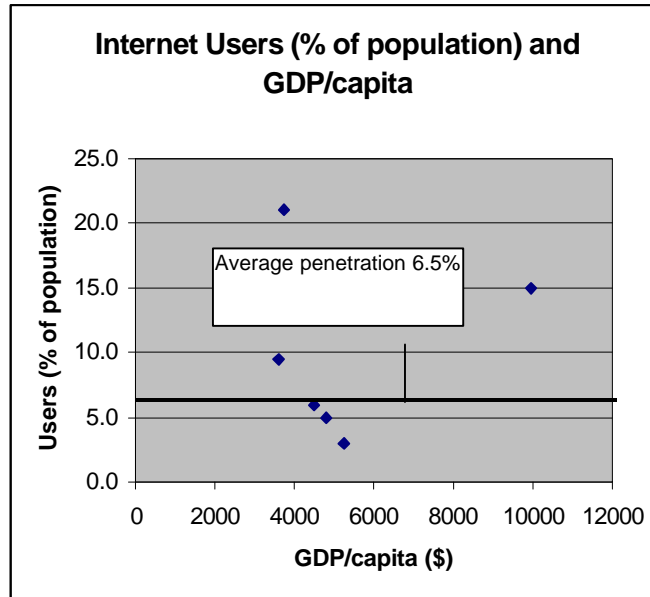
Countries in survey (6 in total) that are: -

Below average		Above average	
Czech Rep	3.0%	Estonia	21%
Hungary	5.0%	Slovenia	15%
Croatia	6.0%	Slovakia	9.5%

(Sources: Economist, CyberAtlas 1999)

The average Internet penetration of 6.5% in the 6 countries surveyed compares with a rate of 21% of the Western European population in 1999.

Internet usage is growing very fast. The most recent evidence (Internet Host count June 2000) shows that the market in central and south eastern Europe is growing at 5.3% per month, roughly double the growth of Western Europe. This analysis suggests that the number of Internet hosts is indeed related to the GDP per capita. However, the results must be treated with caution because the survey only registers hosts within the country with domain name servers using the country code extension (for example ".bg" in Bulgaria). The survey therefore ignores those users who are registered with foreign (normally American) hosts like "hotmail.com" etc.

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[6] CyberAtlas summarized surveys in Croatia (IPSA – Aug. 1999), Czech Republic (IDC – Dec. 1999), Estonia (BMF Gallup Media – Dec. 1999), Hungary (Carnation Consulting – Jan. 2000) and Slovakia (Focus/Weber – Feb. 1999)

*Internet market activity, as measured by numbers of Hosts,
is weakest in the poorer countries*

Internet Hosts in C &SE Europe - June 2000

Internet Hosts in W. Europe June 2000
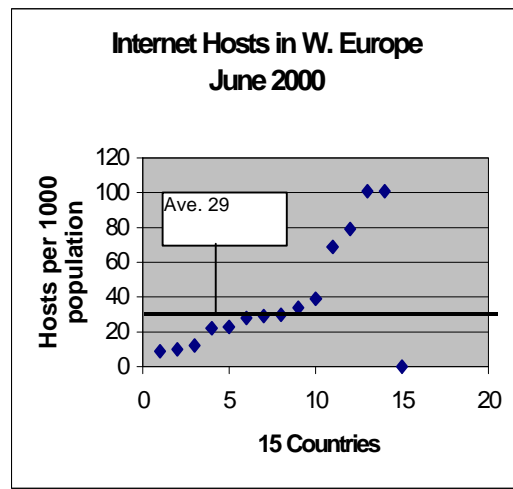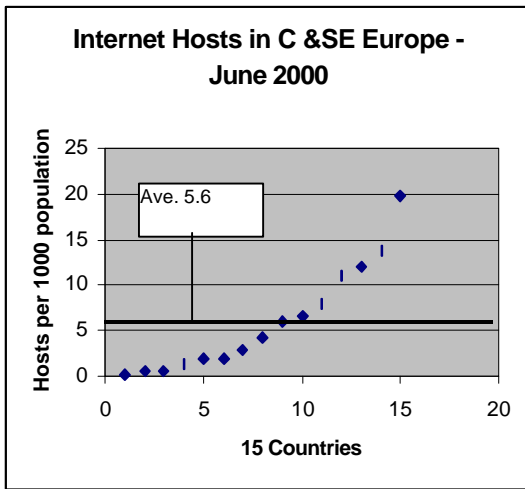
Countries with lower than average Internet hosts in their region;

Central and south eastern Europe		Western Europe	
Albania	0.1	Portugal	9
Macedonia	0.6	Greece	10
Bosnia Herzegovina	0.6	Spain	12
FR Yugoslavia	1.4	Germany	22
Romania	1.9	France	23
Bulgaria	2.0	UK	28
Croatia	3.0		
Lithuania	4.2		

(No June 2000 data for Italy & Luxembourg)
Note: Denmark, at 337 hosts per 1000 population is off the above scale.

(Source: Ripe NCC 19 June 2000)

Internet is used more by the youngest

Internet Use by Agegroup - Estonia
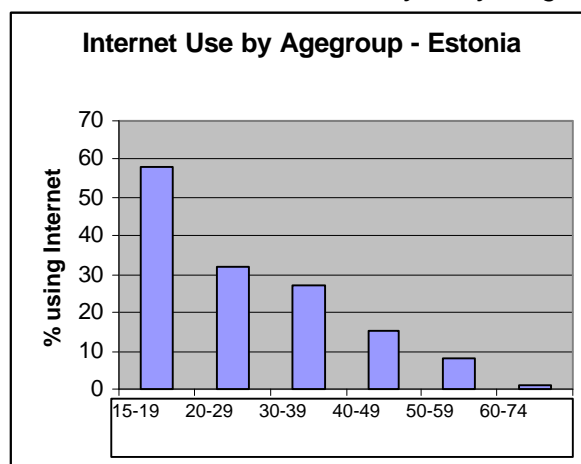
Source: CyberAtlas , December 1999

Some countries are already including computer and Internet in their industrial and government training programmes and in at least one country – Czech Republic – the government has a policy of free Internet access to all High School and University students.

E-commerce is beginning to take off in several countries as legal frameworks for electronic signatures are being put in place. Initial E-commerce applications have included Internet Banking (for example the postal banks and the largest commercial banks) and Internet shopping (mostly books and CDs). On-line booking services exist, mostly for travel and holidays.

In a recent analysis of E-Commerce in Czech Republic carried out for the Phare programme[7], it was estimated that 4%-5% of Czechs use the Internet. The factors cited for this low penetration (compared to other OECD countries) are lower incomes (Czech GDP per capita is only 26% of the OECD average) and higher costs. Connecting to the Internet is relatively expensive, the report quoting Czech tariffs at 311% higher than in the USA and at 43% higher than in Germany. The language barrier was also given as a reason for the low penetration. The report states that two thirds of the content of the Internet is in English. Only 29% of Czechs speak English.

The Phare report also predicted that the main source of E-commerce revenue will be advertising, which generates $1 million per annum. This puts the e-advertising market at only 0.2% of the total Czech advertising market, a far lower proportion than elsewhere. The electronic business-to-customer market was estimated to be less than $1.2 million in 1999. Currently only 400 web sites in the Czech Republic sell goods online, with only 3 selling more than $75,000 of merchandise per year.

Listing the factors limiting the growth of E-commerce in the Czech Republic (as elsewhere in the region), the report cites government bureaucracy (for example insistence on hard copy), a less competitive business environment, technological immaturity and import duties as the main inhibitors.

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[7] Case Study by PricewaterhouseCoopers February 2000 "Restraints on the Growth of E-Commerce in the Czech Republic" carried out under the Phare Multi-Country Programme for Telecommunications and Posts

2.1.7 Telecommunications Tariffs

In general, the prices of local calls, business and residential rentals are lower in central and south eastern Europe (both in absolute and purchasing power parity terms) than in Western Europe, whilst the price of national and international calls are higher. The table below shows the absolute tariff comparison for residential subscribers between the EU and Phare countries (excludes Croatia and FR Yugoslavia).

Residential (off-peak) telecommunications charges in euro
(Jan – Feb 2000 Exchange rates)

4-minute local call price comparison as at February 2000
(in euro, using purchasing power parities)
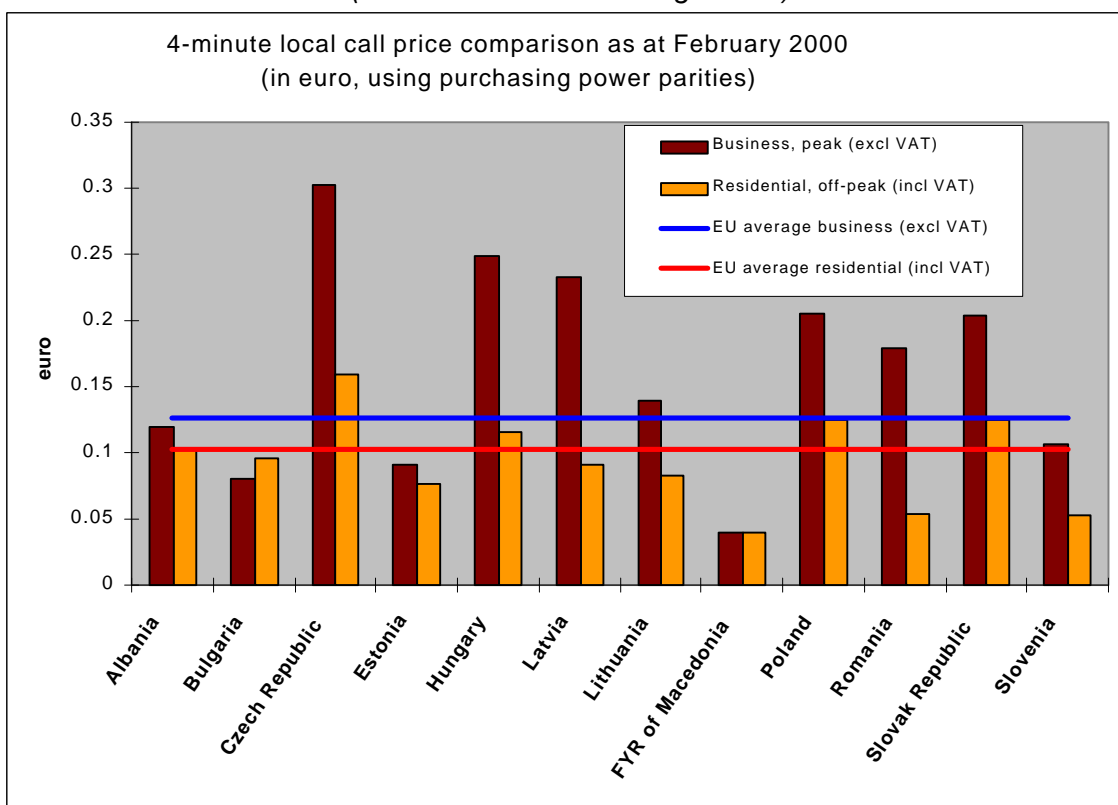
Service	EU Average	Phare Average	Cheapest Phare country	Dearest Phare country
Line rental per month	13.49	4.23	0.39 (Albania)	7.11 (Hungary)
4 minute local call	0.12	0.06	0.02 (Macedonia)	0.15 (Czech Republic)
4 minute trunk call	0.35	0.25	0.03 (Macedonia)	0.40 (Albania)
4 minute call to USA	1.28	2.83	1.06 (Czech Republic)	5.12 (Macedonia)

(Source Phare Multi-Country Programme)

This is principally because EU countries have "rebalanced" tariffs more in line with costs as a direct result of competition and regulator intervention. In the CSEE region, line provision and local calls have traditionally been less profitable. The monopoly telecom operators have kept tariffs for these items low, with cross subsidy being provided by the more profitable national and international calls.

The charts below show different features of the tariff of each country, arranged in ascending order separately for the Phare countries and the EU Member States. (The order of the countries varies from chart to chart). The range for Phare countries and the EU overlap. However, a notable exception is the residential rental, which is lower in every Phare country than in any EU Member State.

National and International calls are generally cheaper in W.Europe

Price ratio, longest national: local (4 min, peak)

Price ratio, US:local (4 min, peak)
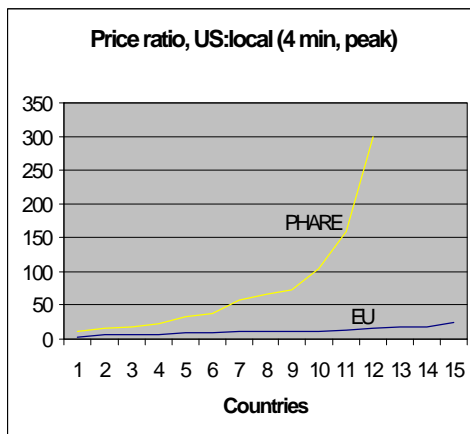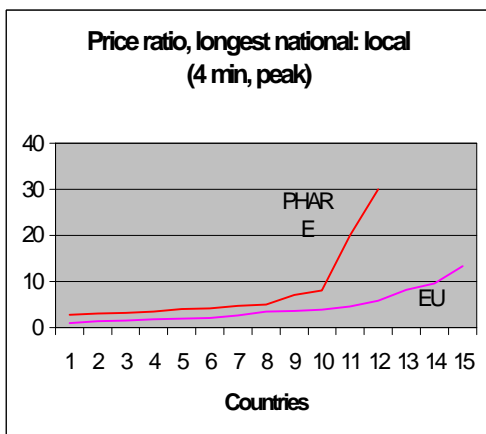
Source: 1999 Phare Multi-Country Programme

Business and Residential rentals are held at low levels while being cross-subsidised by high-price national and international calls

Business monthly rental (euro)

Residential monthly rental (euro)
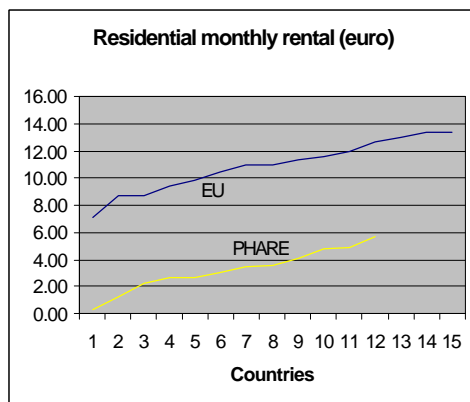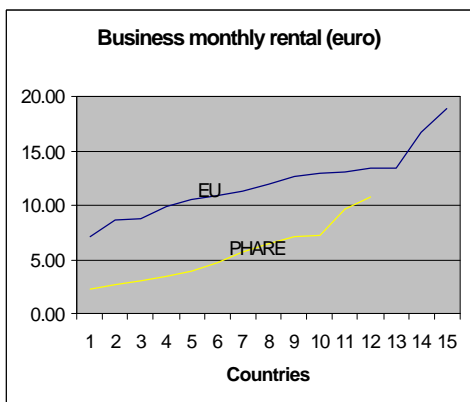
2.1.8 Summary of technical infrastructure

*Summary of ICT Penetration (1998 data for fixed network,
1999 data for mobile and June 2000 for Internet)*

	Central and South Eastern Europe	**Western Europe**
Fixed Networks	24.6 per 100 population	52.7 per 100 population
Mobile Subscribers	10.1% of population	38.4%% of population
Internet Users	6.5% of population	21% of population

*Summary of ICT Growth Rates (1997-1998 annual growth for fixed,
1998-1999 annual growth for mobile, June 2000 monthly growth for Internet)*

	Central and South Eastern Europe	**Western Europe**
Fixed Networks	+11.8% per annum	+8% per annum
Mobile Subscribers	+89% per annum	+67% per annum
Internet Hosts	+5.3% per month	+2.45% per month

(Sources: Public Network Europe, CyberAtlas 1999)

Note: Central and south eastern countries data based on 15 countries, Western Europe based on 17 countries, except Internet hosts, where no June 2000 data exists for Italy and Luxembourg)

The overall picture of ICTs in central and south eastern Europe is one of sustained growth, fuelled by the liberalisation of markets and growing economic wealth. Governments are at last realising the benefits of a free market in new telecommunications services, particularly mobile telephony and all have plans to remove fixed-network monopolies within the next 6 years, most by 2003 (see section 2.2). However, the gap between the different countries remains wide. The penetration and growth rates for each country show a significantly wider range within the region than in Western Europe, where the policies of the EU have funded economic convergence.

In addition to the wide gaps between countries, there are generally significant differences between different sectors of society – in particular between rural and urban dwellers. There are also large differences in the adoption of new technologies between rich and poor (mobile phones) and between young and old (Internet).

2.2. The Regulatory Framework within the Region[8]

The regulatory policies of the countries of central and south eastern Europe are emerging from the post-communist era slowly but surely. During the 1990's, the impact of mobile phones and the Internet has rendered much of the old state monopoly control unworkable. The growth of mobile telecommunications, from an initially lower base than in Western Europe has been impressive, although variable. In countries where mobile phone licences have been issued to more than one operator, the market has been stimulated by competition. Only Albania and Macedonia retain their national monopolies, although both plan to issue second licences soon.

Internet usage is also growing fast, but bureaucratic attitudes and the lack of E-commerce enabling legislation in some countries is restricting economic progress.

In fixed telecoms networks, all countries operated state-run monopolies until the mid-1990s. The progress towards liberalised markets and privatisation has been leveraged by the World Trade Organisation. Another very powerful force is the adopted policy of accession to the EU, which will directly influence the rate of progress with telecommunications reform over the next 5 years.

All countries except Bosnia-Herzegovina and FR Yugoslavia (which are special cases) have announced plans to remove their remaining monopolies in telecoms. In most cases the date fixed is 2003 or before. This is 5 years later than in the EU, but overall liberalisation has taken place in central and south eastern Europe in less than a decade, compared with nearly 20 years in the EU. The summary of progress from monopoly to liberalisation is given in the table below.

Most countries will liberalise their telecoms markets by 2003

Country	End of the monopoly period for: -		
	Local calls	**Long distance calls**	**International calls**
Albania	31 Dec 2002 *	31 Dec 2002	31 Dec 2002
Bulgaria	31 Dec 2002	31 Dec 2002	31 Dec 2002
Czech Republic	31 Dec 2000	31 Dec 2000	31 Dec 2000
Estonia	31 Dec 2000	31 Dec 2000	31 Dec 2000
Hungary	30 Nov 2002	31 Dec 2001	31 Dec 2001
Latvia	1 Jan 2003	1 Jan 2003	1 Jan 2003
Lithuania	31 Dec 2002	31 Dec 2002	31 Dec 2002
FYR of Macedonia	31 Dec 2005	31 Dec 2005	31 Dec 2005
Poland	31 Dec 2002 **	31 Dec 1999	31 Dec 2003
Romania	31 Dec 2002	31 Dec 2002	31 Dec 2002
Slovak Republic	31 Dec 2002	31 Dec 2002	31 Dec 2002
Slovenia	31 Dec 2000	31 Dec 2000	31 Dec 2000

* Local services in rural areas of Albania are already liberalised in theory, but competition has not yet begun.
** Local services in Poland are already competitive in theory, but not in practice.
Note that:
- the liberalisation dates are the same for all three sectors (local, long distance and international) in Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, FYR of Macedonia, Romania, Slovakia and Slovenia;
- the liberalisation date is earlier for long distance and international than for local calls in Hungary;
- the liberalisation date is later for international than for long distance and local calls in Poland.

Source: Phare Multi-Country Programme

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[8] Additional detailed material relating to some countries is supplied in Annex B.

Privatisation is well under way, with foreign investors taking major stakes in the incumbent domestic operators

Country	Privatisation	Notes
Albania	Albanian Telecom remains 100% state-run	Privatisation under preparation – expected 2000/01
Bosnia-Herzegovina	3 local monopolies – PTT BiH, HPT Mostar and Telecom Srpska	Plagued by ownership and political issues
Bulgaria	Sale of 51% of BTC to OTE (Greece) and KPN under discussion since July 1999	Recent news suggests talks have been called off
Croatia	35% of Croatia Telecom sold to Deutsche Telekom in October 1999	
Czech Republic	27% of SPT (now Czech Telecom) acquired by Telsource consortium in 1995, later increased to 49%	Further privatisation planned
Estonia	49% of ETC acquired by Baltel consortium in 1999	Further 35% privatisation planned
Hungary	30.2% of HTC ("Matav") sold to Magyarcom consortium (Deutsche Telekom and Ameritech)1993, increased to 67.35% in 1995. Total privatisation now at 93.4%	
Latvia	49% of Lattelekom acquired by Tilts consortium 1993	Liberalisation date brought forward
Lithuania	Lithuanian Telecom 64.8% privatised in 1998, further 35% offered June 2000	2nd stage sale reduced to 25% on bad market conditions
Macedonia	Privatisation planned for late 2000	
Poland	TPSA 15% IPO in 1988	Bids being considered for a further 25% to 35% of TPSA (France Telecom leading contender)
Romania	35% of RomTelecom acquired by OTE (Greece) in November 1999	OTE has 51% voting rights
Slovakia	Slovak Telecom 51% tender offer in November 1999	Deutsche Telekom leading contender
Slovenia	26% of Telecom Slovenia privatised	Public flotations planned of 20% in 2000 and further 20-30% in 2002
FR Yugoslavia	49% stake owned by OTE and Telecom Italia	

(Sources: Phare Multi Country Programme Co-ordination Unit, Public Network Europe)

In the transition to full competition, a very disciplined form of regulation is needed to ensure that there is sufficient incentive for independent companies to enter markets with the inherently high start-up costs in telecommunications. During the transition, regulators must allow prices to rebalance more in line with costs. Regulators must also protect consumers from potential abuse by any dominant (usually the old state-run incumbent) operators' position, and also allow competing companies to interconnect on an equitable basis.

Measures to assist Rural Penetration

In order to address the rural penetration problem in central and south eastern Europe, (highlighted in section 2.1.3 above), national regulators need to establish an obligation on operators with significant market coverage to provide universal telecommunications services at affordable prices. This is a pre-condition for EU accession, although the definition of affordability is at present left for the countries themselves to decide.

The extent of adoption of universal service obligations is patchy, and needs added stimulus

Country	Comment on Universal Service and Funding
Albania	At very low level of development
Bosnia-Herzegovina	Not yet ready to adopt
Bulgaria	Universal service obligation on BTC, but no evidence of practical application or special funding
Croatia	No specific provisions in the telecoms legislation
Czech Republic	Czech Telecom has an obligation to provide service, but there remain unresolved issues about services covered and funding
Estonia	No specific provisions in the telecoms legislation
FR Yugoslavia	No information
FYR Macedonia	No information
Hungary	Adoption of EU model as early accession candidate
Latvia	None envisaged until 2003 when full liberalisation occurs
Lithuania	Universal service obligation envisaged in law, but currently only applies to voice services
Poland	The new law establishes (belatedly) a universal service obligation with fines on operators for non compliance but experience low
Slovakia	Universal service has existed as a concept since 1964, applied to basic voice services, now updated on 1st July to include low-speed data. No evidence of special funding arrangements
Slovenia	No evidence of operating universal service obligations and funding.

In the transition period to full liberalisation of telecommunications markets, incumbent operators will tend to increase tariffs for local services in order to bring prices more in line with unit costs. To compensate for this, one policy option for the regulator is to set up a universal service fund, targeted at rural development and paid for, *inter alia*, by privatisation receipts. Independent licence holders with local franchises should also benefit from this rural fund. This universal service fund would be used as a means of subsidy to operators to keep basic access and local call charges low, especially in the interim period before telecommunications is truly affordable to rural dwellers.

Regulators must also ensure that the local licensees have favourable (i.e. cost-based) interconnect payments to the national operators for traffic outside their franchise area. This has the effect of reducing entry barriers to new local operators. Without regulatory intervention, the national incumbent operators will tend to levy high interconnect charges. Cost-based interconnect charges are demanded by the World Trade Organisation and by EU telecommunications policy. The faster these charges can be reduced, the easier it will be to solve the rural telecommunications divide.

Many of these regulatory enablers in the critical area of rural telecommunications have not yet been fully implemented. This is an area of regulation where the EU, and particularly the UK (with its extended history of regulatory reform in telecommunications), has considerable experience.

In some countries, the role of the regulator in the field of ICTs has not yet been structured to ensure independent, fair and transparent market controls. In order to avoid conflict of interest, EU telecommunications policy (and that of the World Trade Organisation) insists that the regulator is established independently of the operators. This is a key issue in all countries, because the old government structures normally combined the functions of owner (the state), operator (the telephone company) and regulator (the government department).

Regulators are not yet truly independent

Country	Regulatory Authority	Progress Towards National Regulatory Authority (NRA)	Comment on Independence of Regulator
Albania	Ministry of Public Economy and Privatisation	Telecoms NRA under preparation (Regulatory Entity of Telecommunications – ERT)	ERT officially established as independent self financing entity in 1998, but has yet to show its teeth.
Bosnia & Herzegovina	Role taken by Office of Higher Representative following Dayton	NRA in operation since 1 January 2000	Little evidence of progress in practical terms
Bulgaria	State Telecommunications Commission (STC). The Committee for the Protection of Competition also deals with anticompetitive practices.	Under the August 1998 law, the STC has almost fully taken over the regulatory role from the Ministry	
Croatia	Ministry of Maritime Affairs, Transport and Telecommunications and the Ministry of the Economy (tariffs)	Moves to establish NRA begun in 1999 in order to prepare privatisation sale (to Deutsche Telekom)	Little experience in supporting private telecoms industry, a major concern to foreign investors
Czech Republic	Czech Telecommunication Office (CTO), which is still part of Ministry of Transport & Comms, along with the Ministry of Finance	The establishment of CTO as independent NRA depends on the new Telecom Law to be approved by the Parliament	Relationships between Czech Telecom and the Government have been poor
Estonia	National Communications Board (NCB) ("Sideamet" in Estonian)	The NCB is part of the Ministry of Roads and Communications	Regulator and Estonian Telephone argue vigorously
FR Yugoslavia	Federal Ministry of Telecoms	May 1997 law established regulator, but not independent yet	Serbia on hold, Montenegro pressing ahead along EU lines
FYR of Macedonia	Ministry of Transport and Communications	Establishment of Telecommunications Directorate as the regulator foreseen under 1998 Act	Delayed
Hungary	Ministry of Transport, Water Management and Communications plus the Communications Authority. Competition Office also deals with anticompetitive practices.	Under the 1999 law the regulator Communications Authority will become fully independent.	Regulation has been clear, consistent and transparent. The best in the region.

Latvia	Ministry of Transport and the Telecommunications Tariff Council	Department of Communications (Regulator) is part of Ministry	Under new proposals, the independent Telecoms Regulatory Commission will be created in 2001. Coalition government has resulted in squabbles between ministries and weak political support for the Tariff Council.
Lithuania	Ministry of Transport	NRA under preparation as a result of the 1998 Law (Communications Regulation Agency)	Implementation of liberalised regulation is politically sensitive, therefore CRA has only nominal existence. Progress slow.
Poland	Ministry of Communications and Information. Competition and Consumer Protection Office (UOKiK) deals with anticompetitive practices.	NRA under preparation, truly independent of Polish Operator (TPSA) and the Ministry	Tough, independent and interventionist regulator needed to protect the market from TPSA dominance which has inhibited competition.
Romania	National Agency for Communications and Information (NACI). Competition Office also deals with anticompetitive practices.	NACI intends to set up independent regulator "some time in the near future"	It is unlikely that the new law will establish the intended independence. Frustratingly slow. Competition Office has had little impact on telecoms.
Slovakia	Ministry of Transport Posts and Telecoms (MTPT), Ministry of Finance and Telecommunications Office	The establishment of independent NRA foreseen in the new telecom law to be submitted to the Parliament	Progress encouraging since 1998 general election. Independent NRA legally established 1st July 2000.
Slovenia	Ministry of Transport and Communications	Telecoms Administration of the Republic of Slovenia (URST), within the Ministry	Regulator and government severely criticised for lack of independence by EC report in 1998. Improvement since; independent TA foreseen in new act to be law by 1 Jan 2001 (date of full competition)

The speed at which liberalisation and privatisation occur in central and south eastern European countries will be determined by the powerful vested interests which remain as legacies from the post-communist era. Only when the links between the operator, the state and the regulator are broken can the telecommunications markets in central and south eastern Europe be truly liberalised.

Many activities to advance regulatory reform have taken place with assistance from the EBRD and the EC Phare programmes. Much progress has been made to reflect the EU telecommunications policies into state laws and secondary legislation of central and south eastern Europe. For more details of the international programmes of assistance to the region, see chapter 4.

Chapter 3   Users and potential users

3.1 Summary

The following sections, which are based on a review of the literature and questionnaires distributed to contacts in Poland, the Czech Republic, Slovakia, Hungary, Romania, Bulgaria, Croatia and Albania, reveal:

- The countries of Central and South Eastern Europe are unequal societies with potential for social exclusion based on socio-economic group, ethnicity, sex and age.
- Current use of the Internet tends to be concentrated among the urban, educated (perhaps male) young.
- Governments in the region have policies for the Information Society. In Central Europe, but less so in the Balkans, they have made considerable progress establishing a presence on the web. Interactive services are generally not available however, partly because of a reluctance to move away from paper-based, physically signed and rubber-stamped transactions
- Commercial companies are also responding rapidly to the new technologies, although, with the exception of vanguard software and e-commerce companies (of which most countries have a number), the picture is one of presence on the web rather than e-commerce. This is related to the low number of true credit cards in use in the countries.
- These two factors taken together suggest that the population will have little choice but to embrace ICTs if it wants to interact with government or business and avoid future social exclusion.
- There have been a number of successful schemes to promote public access to the web in more remote areas using telecentres and libraries.
- Telephones have become, and mobile phones are becoming, essential tools for life in the region. There is some indication that this is associated with a reduction in willingness to share access to such technologies.
- Most countries have a corps of highly trained computer professionals who can service the needs of the Information Society.
- There is no reason to think that the population, including the rural population, women and more elderly generations, cannot absorb ICT training. Levels of education and experience in the labour force are generally high, in rural as well as urban areas.
- Suggestions of areas for future development include making the Internet more accessible by:
    - o Making telephone access cheaper
    - o Making electronic payment easier
    - o Providing public access points
    - o Providing training in ICT skills and the English language

3.2 The Social Composition of the User Base

The following statistics give an indication of levels and dimensions of inequality in the region and within countries in the region.

a) Eurostat figures reveal marked disparities between the wealth of the countries of the region as measured by per capita GDP (in purchasing power standards). The range for the countries that are candidate members is from 66% of the EU-15 average in Slovenia to 25% in Bulgaria. Other than Slovenia, only the Czech Republic at 64% exceeds 50% of the EU-15 average.

b) Inequalities within countries remain marked and have increased since 1989.
- Inequality as measured by the Gini co-efficient is generally lower than the OECD average (only Estonia at 40 is higher)
- Inequalities are greater in the less developed countries than the more developed, Central European ones. The Gini coefficient for Bulgaria is 34 compared with 27-29 for Poland, Slovenia, Hungary and the Czech Republic.
- In almost all of the countries in the region (Bulgaria being a notable exception), the figure for per capita GDP in the poorest region is under 50 per cent of the figure for the richest region, which is usually the region around the capital city.
- Hungarian data on personal income tax payment reveal that villagers pay tax to a value of only 57.6% of the national average compared with figures of 83.7% for rural towns, 119.6% for county towns and 191.3% for Budapest.
- Rural poverty has increased since 1989 because of a radical decline both in agricultural jobs and in the industrial jobs to which many villagers commuted.
- Village populations are dependent on subsistence agriculture, a way of life that younger generations may not be willing to accept for long.

c) There are significant inequalities between socio-economic groups, ethnic groups, the sexes, and the elderly.
- A national representative sample in the mid 1990s revealed: Business owners with employees earned the following times more than agricultural labourers: Bulgaria - 2.45, Czech Republic - 2.69, Hungary- 2.1, Poland - 2.8, Slovakia - 2.2.
- Roma (the largest ethnic minority throughout the region) are heavily over represented in figures on unemployment, poor housing and low educational achievement, and their situation has worsened dramatically since 1989.
    - Male Roma employment in Hungary fell from 85% in 1984 to 26% in 1994.
    - Female Roma employment in Hungary fell from 53% in 1984 to 18% in 1994.
    - Over 70% of Hungary's Roma population live in official poverty.
- The same mid-1990s survey revealed: Mean monthly total incomes for women as a percentage of male monthly incomes were: Bulgaria - 77.2, Czech Republic - 64.2, Hungary - 72, Poland - 56.7, Slovakia - 68.6.
- Female unemployment throughout the region is generally higher than male. Hungary appears to be an exception, but this is explained by low labour market participation rates.
- Throughout the region, although as a group their incomes did not decline as rapidly as some because of the continuance of a social security net, pensioners are highly represented in poverty statistics.

d) So far as it can be determined by rather inadequate statistics, expenditure on telephones varies considerably by socio-group:
- In the Czech Republic, farmers per capita spent 56% of the national figure for telephones in 1997, although it had increased to 72% by 1998.

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- In Hungary, 1997 figures for per capita expenditure on telephones in the ten income decile groups (expressed as a percentage of the expenditure of the highest group) were: 1st decile - 20.1%, 2nd decile - 30.1%, 3rd decile - 36.2%, 4th decile - 39.3%, 5th decile - 41.0%, 6th decile - 46.8%, 7th decile - 52.5%, 8th decile - 59.4%, 9th decile - 68.8%, 10th decile - 100%. The percentage of households having telephone service increases from 47.2% in the lowest decile to 88.1% in the highest decile.

e) Internet use is growing rapidly, but it is restricted to a narrow social group:

- Accessing the Internet is the preserve of the urban younger generation, students and businesspeople. A Czech report also suggested that Internet users were predominantly male, although this was the only study to indicate a gender bias. Internet users in Hungary are urban, young and graduates. Estonian Internet users are also predominantly young (58% of those aged 15-19 use the net compared with only 15% of those aged 40-49, although that figure represented a doubling in use since 1999). Internet users in Poland are in most cases young (43.5 per cent are between 18 and 25 years old), and educated: 30.5% with higher education, and 32.8% with middle education. A Bulgarian report in April 2000 found that the majority of users were students and young professionals. However, Internet use in villages in Bulgaria, where 38% of the population live, was negligible.

f) Our survey of advertisements (see Questionnaire Responses - Section 2) confirmed the presence of a rural-urban divide. Although the absolute percentages varied quite considerably, the ratios between the rural to urban figures for advertisements referring to the Internet were all in the range 1:1.5 to 1:3.

A summary of the findings of our questionnaire on this topic is given on the following page.

Questionnaire Responses - Section 2: Social Composition of the User Base								
Question	**Poland**	**Czech Rep**	**Slovakia**	**Hungary**	**Bulgaria**	**Albania**	**Romania**	**Croatia**
Does the national statistical office have data on telephone availability or expenditure by socio-economic group or location type?	No data by socio-economic group. See Annex C.	Data would have to be purchased. Data for crude socio-economic groups and some regions available See Annex C	Data would have to be purchased. Rudimentary data available below	Data not available by socio-economic group, but is available by settlement type and income decile. See Annex C	No data by socio-economic group, but some regional figures. See Annex C	No data by socio-economic group. See Annex C	No data by socio-economic group.	No data by socio-economic group. County data available. See Annex C
% of adverts giving web or Internet addresses in magazine aimed at business readers.	Businessman: 85%	Ekonom: 83%	Slovak Trade Forum: 50%	Heti Világ Gazdaság: 53.6%	Bulgarian Business: 51%	No data	No data	No data
% of adverts giving web or Internet addresses in magazine aimed at rural population.	Ecoprofit: 60%	Nový Venkov: 44%	Ro¾níck Noviny: 20%	Mezõgazdaság i Technika: 29%	Zemia and Bulgarian Farmer: 18%	No data	No data	No data

3.3 Governments

Governments in the region have policies for the Information Society. Governments in Central Europe, but less so in the Balkans, have made considerable progress establishing a presence on the web. Interactive services are generally not available however, partly because of a reluctance to move away from paper-based, physically signed and rubber-stamped transactions. In the Balkans, two divides appear to be forming: between Bulgaria on the one hand where developments are significant, and Romania and especially Albania where the poor infrastructure prevents rapid take-up; and within the former Yugoslavia between the richer countries of the north and west and the poorer and war-torn countries of the south and east.

a) The Policy Context
The context of ICT policies within overall government strategies varies greatly between the countries of the region. All governments appear to be aware of the importance of ICTs, and have introduced policies to promote them, even if they have not explicitly adopted an Information Society policy.

- The presence or absence of a stated government Information Society policy says little about levels of ICT provision. The three countries with no explicit information society strategy are Hungary, Slovenia and Romania, with very different levels of provision between Hungary and Slovenia on the one hand, and Romania on the other. Hungary does not have an official plan yet (although one is in preparation) and, like Slovenia, has high levels of provision.
- Where countries have them, the contents of the programmes are predictable (building an ICT infrastructure, introducing ICT to management, health, education, creating Information Society specialists, training the population for the Information Society etc.) although the focus in each country varies, reflecting their particular needs and existing levels of provision.
- Only the Czech policy explicitly addresses the issue of 'Trustworthiness and safety of information systems and protection of personal data'.
- The existence of a strategy says nothing about how well it is being implemented, although our questionnaire results suggest that, in the main, most policies are pretty much on target.

b) National government and institutions of higher education are relatively well served by the Internet. Schools, local authorities and libraries enjoy a much lower standard of service. It should be noted that the figures below come from the European Survey of Information Society (ESIS) and refer to web sites rather than access to the web. This is because the ESIS is more interested in web presence than web access. The ESIS figures can nevertheless be taken as a useful proxy for web access (presumably supplying a lower bound).

- In Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland and Slovenia, between 85 and 100% of national ministries and between 55 and 100% of Universities and 'High Schools' have web sites.
- In Albania and Romania, the situation is much worse, 33% and 25% respectively of national ministries, and 1% and 9% respectively for Universities and High Schools have web sites.
- Web sites in schools, hospitals, museums and libraries are virtually non-existent in Albania and Romania, and their provision in local authorities is minimal, 3% and 9% respectively.
- Provision of web sites in schools of all kinds is highest in Slovenia, 54%, followed by Estonia, 24%, but is generally well under 20% even in the

wealthier Central European countries, and only 2.3% in Bulgaria. (NB figures for secondary schools only are more impressive. Hungary claims 100%, Poland 33%)

c) Central government makes more use of the Internet and e-mail than local government.
- Although our questionnaire did not ask respondents specifically about the difference between central and local government, all reported that central government made more use of these technologies than did local government.

d) Central government in Central Europe makes extensive use of email for internal communications and the Internet for communication information to the public at large. This is less the case in the Balkans, especially Albania. Our questionnaire suggests:
- extensive use of the Internet by central government in Poland, Hungary, the Czech Republic and Slovakia, offering information about employment, taxation, legal developments etc
- much less use in Bulgaria and Croatia, and
- even less use in Albania

e) Although use of the Internet by government agencies is extensive in Central Europe, it mostly takes the form of providing information on web pages. There are very few examples of applications for permits or licences being possible over the Internet. In the Czech Republic this was one of the few areas where the Information Policy fell behind target. A variety of interactive services are now promised by the end of 2000.

f) Even relatively wealthy countries like Hungary are experiencing difficulties funding increased government use of ICTs, whether in terms of the provision of Internet services for the public or internal use such as email.
- Estimates for future Internet use by type of institution in Hungary suggest a much lower growth rate in government institutions than any other institution.
- Individual and company use in Hungary more than quadrupled between 1997 and 1998, more than doubled again in 1999, and was estimated to double again by 2000. Government use had not even doubled its 1997 figure by 1999, and would only just double it by 2000.
- Our Hungarian respondent reported shortages of floppy disks in governmental organisations - one per employee, to be accounted for at the end of each year.

A summary of the findings of our questionnaire on this topic is given on the following pages.

Questionnaire Responses - Section 3: Government							
Question	**Poland**	**Czech Rep**	**Slovakia**	**Hungary**	**Bulgaria**	**Albania**	**Romania**	**Croatia**
What are the govt's policies in relation to new or revised e-commerce laws?	The regulations surrounding e-commerce are critically discussed in the media and the media is full of stories like 'all business will be e-business soon'. Some progress but key matters such as electronic signatures missing	The govt is pressing for the development of e-commerce and has just passed a law allowing electronic signatures.	No criticism of govt. Use is growing fast, subject to purchasing power of population	Recent govt restructure to take issue more seriously and start work on electronic signatures	There are only ideas, not plans, about e-commerce regulation, but there is no pressing demand from below	There is no published policy because e-commerce is not feasible due to the low penetration of Internet	No general criticisms of government policy.	Govt severely criticised for slow progress
Does central and local government provide services using the Internet (such as employment info, tax laws, applications for licences and permits)?	Wide range of information including application forms. Applications for some licences (car licences) but not passports. See Annex C	Wide range of information available on Internet. But policy has fallen behind in putting application forms on web. These will be available at the end of 2000. See Annex C	Wide variety of information (employment, tax etc.), but no applications for permits etc	Wide variety of information (employment, tax, legislation etc.), but no applications for permits etc All ministries and govt bodies have home pages.	The govt offers no services on the Internet	Some Ministries have home pages	Little. 56% of ministries and 8% of regional and local authorities have websites. Internet Citizen Information Centres are being initiated	To a limited degree only

Question	Poland	Czech Rep	Slovakia	Hungary	Bulgaria	Albania	Romania	Croatia
Do central and local governments use call centres to handle enquiries over the phone?	No. Calls directed through operator	Some	No	No	No	No. Even direct lines without going via the organisation's operator are rare.	No	No
If so, do they make use of 'interactive response technology'?	No	Some	No	No	No	No	No	No
How successful is the government's policy for extending Internet use to schools?	The policy is on target for 80% of secondary schools connected by end of 2000. Each school to have 10 PCs, internet access and 1 printer	Independent research criticises the gap between elementary and secondary school provision, the poor pupil-PC ratio (which does not allow the use of computers as an integral part of education), and the small number of computers with good internet connections.	The programme appears to be on target.	The programme appears to be on target but there have been complaints about the speed of the internet connection. 150,000 pupils now access the web, mainly Hungarian language sites	Rural access is weak, but many elementary schools are connected and there are private internet clubs for young people	Only Soros Foundation active here. Govt has few published plans.	The programme is behind schedule because of insufficient funds	It is not even clear that the government has such a policy, although some schools have web sites and Internet access.

Question	Poland	Czech Rep	Slovakia	Hungary	Bulgaria	Albania	Romania	Croatia
How extensive is government use of the Internet and email internally?	Little use.	Use of email is common in central govt	Use of email is common in central govt. Little use in regional and municipal govt	Official info not currently available because of govt restructure. Email common in centre, but not in regions, and documents go by normal mail. Shortage of consumables such as floppy disks	The govt makes little use of email, either centrally or locally. Locally only bank branches are connected to email	Some use of email by central government.	Minimal	Minimal. Descriptive web sites for external use
Does government operate its own Intranet?	No	Ministries and many other govt bodies have intranet	Central govt has GOVNET intranet.	See above. Central Statistical Office does	No	Local area networks use, not Intranets.	No	No

3.4 Companies

There has been a dynamic growth in ICT-related businesses, but e-commerce has developed more slowly.

a) Our literature review has suggested the following picture:

- Almost every country can report stories of successful domestic computer businesses, usually based around software and a particular niche product (Graphisoft, Recognita, E-Pub and Synergon in Hungary, Computerworld Polska in Poland, PCS, Expandia (the internet bank), Software602, AutoCont, ProCa and Comfor in the Czech Republic, Rila Software in Bulgaria, and Iskon in Croatia). More detail on these and other companies is presented in Annex C.
- But if they are to achieve or maintain a global presence, they are generally obliged to enter a strategic alliance with a western firm (Recognita via American competitors Caere and subsequently ScanSoft in Hungary, Rila, effectively via the Soros organisation, in Bulgaria). Otherwise, as in the case of Prokom and Softbank in Poland, they often remain reliant on a single large contract.
- Reports in 1999 suggested that domestic company management in the region was unaware of the possibilities of the Internet for commerce and was thinking about no more than creating a web information page.
- Croatia has developed its Internet rather slowly, with only 5 private ISPs. 95% of the country's small user base (3% of the population) use the services of the state-owned telephone company.
- The Internet in Bulgaria has grown by 80% since 1999, from a very low base, and the market shows signs of immaturity. Over 200 ISPs operate, but only 12 operate in more than one region, and none has more than 7% of the market. They are concentrated in Sofia where one third of net users live.
- Nevertheless, a national survey in the Spring of 2000 of those aged between 15 and 35 in Bulgaria found that a third of respondents could not speak a foreign language, 59% had no computer skills and 73% had never accessed the Internet.
- Only one commercial ISP operated in Bosnia-Herzegovina in addition to the one operated by the Soros Foundation.
- Macedonia had 5 ISPs in 1998.
- In Romania, where 2000 villages have no fixed line telephone, 11 major commercial ISPs operate.
- In Serbia there is only one independent ISP. The others are controlled by the state telecoms company or banks close to the regime.
- In Bulgaria there are fewer than 3,000 corporate sites on the web, 1% of companies operating in the country and only 24 of the top 100 companies had an operational website at the end of 1999.
- The companies responding quickest to ICTs are the multi-nationals operating in the countries rather than domestic SMEs (only 7% of Polish SMEs use the net in any way; e-commerce in Hungary was worth $320 million last year, but 99% of it came from multi-nationals), a fact which can distort apparently optimistic growth figures.
- E-commerce is still relatively insignificant: 88% of Polish companies have web sites, but less than 20% use the internet to buy and sell products; an IDC survey of over 900 companies in the region found that just over a half had a web site and only 3% sold anything on-line. EDI is also reported to be poorly developed.

- Yet e-commerce is growing: 46% of Hungarian internet users in 2000 said they planned to buy over the Interet in the next 6 months - the most common purchases being CDs, DVDs, video and audio cassettes and books; seznam, the Czech portal, listed over 50 internet shops.
- And banks in the region are reportedly beginning to recognise that Internet banking, by slashing transaction costs, is an ideal way of providing funds for smaller companies which they have had to turn down in the past. According to one banker, realistic minimum loan sizes have fallen from $100,000 to $40,000.

b) Our questionnaire responses:
- confirm this picture, pointing to some of the same and some different companies (see Annex C)
- indicate the difficulties associated with keeping track of this mushrooming growth. Official statistics are rarely up-to-date and not recorded in a way which facilitates analysis by sphere of activity. Even when these hurdles are overcome, it is not always clear that firms actually operate in the sectors for which they are registered.

Our questionnaires also reveal unambiguously that the potential threat that ICTs can pose, and are posing currently in the west, to branch offices of service providers of all kinds is not real in the CSEE region. This is partly because e-commerce solutions do not yet provide real competition. It is also because the service sector was poorly developed in the communist countries, and its branch office network was particularly weak.

Additional information on ICT-related companies in many of the countries of the region is presented in Annex C.

A summary of the findings of our questionnaire on this topic is given on the following pages.

Questionnaire Responses - Section 4: Companies								
Question	**Poland**	**Czech Rep**	**Slovakia**	**Hungary**	**Bulgaria**	**Albania**	**Romania**	**Croatia**
Examples of successful companies established by people with IT skills	Computerland, Optimus SA, Techmex SA, Prokom SA See Annex C	AutoCont, ProCa, Comfor, Software602 But only one in list of top 200 companies See Annex C	GRATEX International NEXTRA	Recognita, Graphisoft See Annex C	Rila software house See Annex C	None	WebQuote SRL, Softwin	Iskon See Annex C
Examples of new businesses started using the Internet	BCH.COM.P, Poltronic, Internet Partners etc See Annex C	SPRINX sro. See Annex C	Internet magazine inZine, Globus – internet daily newspaper	Elender, KarrierExpress z, PremierPark See Annex C	Pensoft, private publishing house	None, except the ISPs themselves. Internet insufficiently developed	BTRnet, eshop.ro, eflowers.ro, rtc.ro, cartea.ro	Abacus in Zagreb, Brodinx in Split
Is it possible to identify IT-related businesses in new business registration statistics?	No data	Possible in principle, but would require access to raw data. Private companies could provide similar data for a fee	No data	With difficulty because companies register for many sectors and are not always active in them	No easy way to identify IT new businesses. They are concentrated around Sofia, Plovdiv, Varna, Rousse, Stara Zagora	No	No	With difficulty. Global figures for new businesses only
If so, what is size and geographical distribution over last 12-18 months?	NA	NA	NA	Data not available for this period	No credible data available for last 12-18 months.	NA	NA	NA

Question	Poland	Czech Rep	Slovakia	Hungary	Bulgaria	Albania	Romania	Croatia
Names and contact details of ISPs	16, See Annex C	50, See Annex C	21, See Annex C	4 major providers and at least 25 others, See Annex C	Uncertain, but some claim 1000 in Sofia alone. Others claim 200 for country See Annex C	5, See Annex C	7 major providers. See Annex C	2, Hinet and Iskon See Annex C
How long are users connected?	20.3% 20 mins 21.9% 30 mins	No data in this format. See Annex C	No data	Confidential	No data	Confidential	No data	Hinet: 12 minutes
How many page impressions to they make?	No data	Ditto	No data	Confidential	No data	Confidential	No data	Hinet: 3.6
How much internet content is in your own language?	No data	Most is in English and translators can be downloaded	No data	No data	No data	Little. Mostly under construction still	No data	Wide range of sites in Croat
How many e-commerce sites are available in your language?	No data	1000+ found, and volume of sales is expected to double in 2000. See Annex C	100+	Perhaps 1000	No data	None	Approximately 10	13 found. See Annex C.
How many credit card purchases via the Internet?	No data	No data. Although the possibility exists, media discussion suggests it is not an option on most sites	No data	No data	No data	NA	No data	No data
How many purchases using other payment methods?	No data	Juice payment. See Annex C	No data	No data	No data	NA	No data	No data

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Question	Poland	Czech Rep	Slovakia	Hungary	Bulgaria	Albania	Romania	Croatia
How many people have credit cards?	Banks unwilling to disclose. 4.5 million Visa card holders	2-4000 credit cards. Other bank cards (1.5m) are not acceptable for e-commerce. NB Expandia Bank however	Banks will not disclose	4 million cards of all types in 1999	Very few. One bank reports 'only a dozen' See Annex C	Confidential	400-500,000	Banks mostly unwilling to disclose. Bank of Split reports total of: 108,623
How many people speak enough English to undertake an Internet transaction in English?	No data in readily accessible sources, but could be derived from statistics	Official and unofficial estimates put it at 29-33%	No data available, but below 20%	More than the 10% of the population who admitted to speaking a foreign language in 1990, but less than 30%	Well under 30%	No data	No data	No data. 1st language of under-40s
Is there any evidence of closure of branch and local offices of banks etc because of competition from Internet businesses?	No	No	No. Internet businesses do not yet represent real competition	No	No	No	No	No.

3.5 Local Group Initiatives

Sections three and four have suggested that in the relatively near future, especially in the countries of Central Europe, but also in more developed regions of the Balkans, citizens will have little choice but to embrace ICT technologies if they want to interact quickly and effectively with government and business. Responding to this challenge, various initiatives have already been taken to improve public access to the Internet.

a) Telecentres
Telecentre or Telecottage initiatives are developing successfully in Hungary (159 in operation, 23 with satellite stations, at the time of writing, 200 expected, 50 with satellite stations, by the end of 2000), in particular, and Estonia (increasing from 3 in 1993 to 32 in 1997), and, more recently, in Bulgaria. The Czech government is sponsoring the development of 'information kiosks' within two years in post offices and retail centres.

The experience of telecottages in Hungary suggest both the importance of co-operation between NGOs, local authorities and local businesses and the necessity of independence for the telecottages themselves. Their findings were that successful telecottages required founding capital of $15-20,000 and additional financial support for the first two years of operation. After that, given a good network service and a business-like attitude, they can support themselves through fees for local services, grants, business brokering services through the network, and the provision of services to state and local government offices.

b) Libraries
An alternative locus for public access to ICTs is via public libraries. These have proved successful in western Europe and projects to promote such access have been supported by the Regional Information Society Initiatives of the European Union. An example of a project of this kind, which included Länder of the former GDR, is described on http://www.istar.org.

Our library questionnaire was distributed to a different set of CSEE contacts. Its findings indicate a level of ICT provision in this area that is consonant with their general level of Internet access. Lithuania, with only 3% of its population accessing the Internet, has a rather low level of provision. So too do Poland and Romania with their relatively low telephone densities. Hungary comes in the middle, and Slovenia, the country with the highest Internet access in the region, has 100% access.

In Hungary it is clear that libraries are seen as having a more general role in information provision and using the Internet as a vehicle towards this end. In Lithuania, libraries are still seen as repositories of printed matter, and the computer systems envisaged are geared to cataloguing and providing information about that body of printed matter, rather than as a means of providing Internet access.

The full answers are summarised in Questionnaire Responses - Section 5.

In the Czech Republic, the regional library Karviná, winner of The European Library Award, HELSINKI 2000, illustrates how public libraries can offer Internet access to a variety of clients. The library offers commercial access for business users and an Internet club with a variety of tariff rates designed to suit all private users' pockets. The site can be accessed on http://www.rkka.cz.

c) Other Groups

The Soros Foundation and its various associate institutions have done much throughout the 1990s to give an Internet voice to minority groups of all kinds with the aim of promoting an 'open society'. This has included work with libraries, as well as NGOs of all sorts. Many non-governmental sites in the region can trace their origin to the sponsorship of one of these organisations. Further information can be obtained from http://www.soros.org/internet/index.html.

A summary of the findings of our questionnaire on this topic (with a different selection of respondents) is given on the following page.

Questionnaire Responses - Section 5: Public Libraries and ICTs					
Question	Hungary	Lithuania	Poland	Romania	Slovenia
Roughly what percentage of libraries are connected to the Internet?	45%	44% (of central and regional public libraries)	5% (ESIS figure. These are generally low.)	30%	100%
Do libraries provide Internet access points for users?	Yes	11 (of 27) provide access to readers	Very few, unless eg Tempus grant	Major libraries only	Most public libraries do
If so, do they charge, and how much?	£1.20 per 30 mins	It varies. Max is approx 90p per hour	Not yet	No	Usually free
If libraries have Internet access, do they use it to do research on behalf of citizens?	Yes	Few. Readers often help staff using staff terminals	Very rarely	Yes	In some cases. Up to individual libraries
If so, do they charge for such services, and how much?	Some charge fee, others just cost of paper etc	Yes, but not commercial rates	To cover costs only	No	Usually a symbolic amount if at all
Do they provide other forms of assistance to people wanting to join the 'information society'? (Books, training, IT support?)	Yes: handbooks, guides, user training, in some cases PC access for word-processing	Yes: books, training, IT support	Librarians need training first	Yes: books and training in using the online catalogues and CD-ROMs	Yes, all these
Does the government have a programme for connecting libraries to the Internet?	Yes	No. Various programmes to computerise libraries, but not with the goal of Internet access	No, for schools and communes only	Yes	Yes
If so, how advanced is that programme?	Well advanced. Ministry of Culture announces applications for development of library telematics every year	NA	NA	Beginning of setting up a national network	Most already connected and staff well trained

Note:

The British Council supports the management of libraries in the region by organising training courses with UK specialists and supporting participation in seminars in the UK. It sees part of its role as being to transfer intellectual and in some cases technical know-how of ICTs from Britain by supporting institutional co-operation.

3.6 General Public

This section deals with two aspects of the relationship of the general public to ICTs: ways in which telephones and the internet are used, and the quality of the human resources available, both in terms of ICT professionals and everyday users in the rural population.

a) Use of the telephone
Our questionnaire results suggest the following:
- Despite media stories that you can still wait ten years for a phone in the Czech Republic, normal waiting times in Central Europe are much reduced to a few weeks or even less, compared with lists measured in years for 1996. Our respondents in the Balkans were unwilling to cite figures. The statements given should be compared with estimated average times in April 2000 for Albania and Bulgaria of 2 months and 2.8 years respectively. Waiting lists in Croatia are likely to be shorter because of its relatively high telephone density in the communist years.
- Access to pay phones has also improved compared with the past, although they remain within a restricted area in Albania.
- Bribes to get up the waiting list and paying a higher rent or a higher initial payment (key money) have disappeared from Central Europe and Croatia, but not from Bulgaria and Albania.
- Jokes about the length of the waiting lists only continue in Albania.
- Substituting a mobile phone for a fixed line was common in Hungary in the early 1990s and is still reported in the Czech Republic and as an interim solution in Bulgaria. But increasingly they are been seen as having different roles. They are too costly in Albania to be an alternative for all but an elite.
- With well over 90% territorial coverage in Central Europe and Croatia, using a mobile phone is a practical although generally expensive option in many rural areas, our respondents suggest that it has made a significant difference to the business lives of people in peripheral areas. Hungarian farmers can check wholesale prices in Budapest and Szeged before deciding where to sell their produce.
- With the exception of Albania, mobile phones are now seen as a tool of modern life rather than a luxury. It is not surprising then that a fixed line phone is nowhere seen as a sign of belonging to an elite. Indeed, the reverse is true: not having a phone is a sign of low status.
- There was no clear view on whether liberalisation has resulted in improved services, mainly because full liberalisation has not taken place in most countries.
- The quality of many phone lines remains poor, with slow transmission speeds which make connecting to the internet service provider cumbersome.
- The answers to the questions concerning whether or not it is acceptable to use a neighbour's phone suggest that, for most of the region, the era of a community of poverty and shortage has passed. Levels of provision, while not high, are not so low as to make automatic the expectation of co-operation on the basis of shared adversity. The literature on less developed countries which suggests that real access to telephones and the Internet is greater than penetration statistics suggest because of communal sharing of resources might not therefore be appropriate for the region.

b) Use of the Internet

Internet access is work-based rather than domestic, partly because of the level of phone charges which are perceived as high: this is regularly cited as a barrier to internet access (see Section 7 below).

- Figures for the percentage of the populations of the countries in the region who have Internet access are generally in the range 2-6%, although 9% was reported for Slovakia in 1999 and Estonia reported an exceptional 21% by Spring 2000.
- Figures for domestic users of the Internet, on the other hand, exceed 2% only in the Czech Republic (2.5%), Slovenia (5.6%) and Estonia (8.3%).

c) Quality of Human Resources - Experts

With the exception of Albania where computer science did not exist as a discipline for most of the communist years, the region has produced a large number of high quality computer specialists. Indeed, precisely because of the shortage of physical resources, these human resources had to be particularly inventive. In the words of the head of Recognita (see Section 4): "Hungarians are not pampered. An American engineer sits down and makes a list of what he needs to create something, while a Hungarian looks around in the pantry and starts thinking about what he can use for his idea."

- There are large numbers of computer graduates from numerous institutes of higher education throughout the region
- The European Commission's Information Society Promotion Office has noted that 'CEECs have traditionally a very high R&D potential in the fields related to the Information Society. This is reflected by the relatively high participation – EU average (in terms of submissions) - in the last IST programme call [of the EU's Fifth Framework Research Programme].'
- These highly qualified researchers have attracted IBM to establish an R&D centre in Prague and Nokia, Ericsson and Xerox to do the same in Budapest.
- On the other hand, many *ICT* graduates seek work in western Europe which exacerbates the already significant degree of labour shortage.
- Most CSEE countries report a shortage in ICT qualified labour, a fact which is reflected in higher salaries in the ICT sector - 2-4 times the national average.
- The exception in terms of the labour market appears to be Bulgaria which has perhaps an oversupply due to the collapse of its communist industry, a factor in the creation of Rila software (see Section 4).
- But the graduates do not have the appropriate skills because university courses and equipment are out-dated. (Cisco Systems is trying, with some success, to get universities in the region to adopt an alternative curriculum developed by them).
- In the Czech Republic it is already accepted that all graduates, from whatever discipline, must be computer literate.
- Graduates generally lack commercial awareness.

d) Quality of Human Resources - The Population at Large

For all their economic failings, communist economies, with their low wages and absence of unemployment, were associated with high degrees of labour participation, which included women and minority groups such as the Roma. They were also associated with high standards of education, again including women, but not the Roma who rarely progressed beyond elementary education and found employment in unskilled sectors of the economy.

This was also reflected in rural areas: although communist regimes neglected their regions and the rural infrastructure, the faith they retained in education applied nation-wide. The human resources in the countrysides of the countries in the region are probably better educated than their equivalents in the west, and have experience of employment in sectors which provide transferable skills.

- The share of rural dwellers with a completed secondary education is considerably higher in CEECs than in western Europe - 54% compared with 32%.
- The share of the rural population employed in agriculture in the mid 1990s was 20% and under.
- Of the rural population aged over 18, 25-55% were pensioners, and those employed in:
    - manual agriculture accounted for: 4-25%
    - manual non-agriculture accounted for: 18-25%
    - managers, white collar & entrepreneurs accounted for: 15-40%
- The ratios were broadly similar when these same people were asked about their longest employment in the 1980s.

These characteristics suggest:

- In terms of the population generally, and also in terms of women, and elder generations, human resource endowment is such that people in the region should be no less capable of absorbing the skills required for handling ICTs than their counterparts in western Europe.
- This may not be the case for the Roma minority. Extreme social exclusion over generations, exacerbated by its negative experience of the transition to a market economy, has left them with low educational achievement and low levels of occupational skills.

A summary of the findings of our questionnaire on this topic (with a different selection of respondents) is given on the following pages.

Questionnaire Responses - Section 6: General Public							
Question	Poland	Czech Rep	Slovakia	Hungary	Bulgaria	Albania	Romania	Croatia
Waiting period for phone line in urban area	Up to 3 months in Warsaw because of high demand	A month in Prague	2 weeks	60-90 days officially, but often 1-2 weeks, even 1-2 days for business lines	Easier in urban areas	Key difference made in Albania is between residential and business lines	No data	Longer in cities because of high demand.
Waiting period for phone line in rural area	Less than three weeks in traditionally less developed areas	A month, although newspaper accounts refer to still having to wait 10 years	1-2 months	As for urban areas, except for remote regions and regions with scattered farms 35-40% of rural lines not digital	More difficult in rural areas, unless near district centres or new exchanges	Only VIPs get phones. A project to develop rural phones is underway	No data	Shorter in rural areas because less demand.
Under the counter payments	No longer necessary	No data. Mobile phones are relatively cheap	No data	No longer exist	Widespread: $300-500	Extensive but amounts are kept secret	None	No data
Rental differential/ key money	No differential	Subject to negotiation	No differential	No differential. Telephones are cheap and easy to obtain	Difference in rented housing only. Subject to negotiation	$600 per year	No significant differential in urban areas	Former exists, but level is unknown
Telephone waiting lists are jokes?	No	No, not now	No	Not any more	No, neither now or in past	Yes	No	No
People give up on fixed line and buy mobile instead?	No. They fulfil different roles.	Yes	No	Not now, but was in early 1990s, so giving impetus to mobile networks	People do not give up, but buy mobile as an interim measure	No, because mobile phones too are costly	No	Yes

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Question	Poland	Czech Rep	Slovakia	Hungary	Bulgaria	Albania	Romania	Croatia
Do rural people have option of mobile rather than fixed line	Vast majority of country covered.	95% of country already covered, 99% by end 2000.	Yes, almost universal coverage. .	All 4 networks cover 98-99% of territory.	Yes, 73% of territory covered.	Only the west of the country can use mobile phones, and the *cost* anyway is prohibitive	Yes, 72-85% coverage. But expensive	Majority of country
If choice of service provider, has service improved?	Local competition, but it is weak. Quality of service has not improved	Liberalisation due 2002	Liberalisation due end 2002	Yes. Increase in digital lines. Decrease in number of phones out of order	Monopoly provider. Nevertheless, service has improved	Both fixed lines and mobile are monopolies	Liberalisation due end 2002	HT still monopoly
How important is getting a phone?	Less important than running water and waste disposal. More important than good bus service	Relatively unimportant since there is access to a phone in almost all areas	On a par with other basic infrastructural provision	It has become a basic essential of life, more important than water, waste disposal etc. Number of calls remains high despite high charges	Below running water and proper medical care, but above better bus service and mains drainage	Low priority, after medical care, running water, etc.	Low priority, after medical care, running water, etc.	Very important as sign of status

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Question	Poland	Czech Rep	Slovakia	Hungary	Bulgaria	Albania	Romania	Croatia
Is it acceptable to use neighbour's phone?	Yes	Yes, but in the context of reciprocal social exchange	No	Only in real emergencies. Public phones easily available	Yes, so long as a habit is not made of it	Yes, but in emergency or extreme case of some kind.	Yes	Yes, definitely
Is it easy to find working pay phones?	Yes	Yes	Yes	Yes, 96% work in 1996 compared with 72% in 1991	Yes, must more so than in past	In city centre and radius of 2 km	Yes, in Bucharest and large cities	Much easier than in past
Does phone ownership mark you as member of elite?	No	No	No	No, quite the reverse. Those without phones are excluded from society	No	Not any longer	No	No, but not having one is a sign of low status
Are mobile phones luxuries or essential tools of modern life?	No longer luxuries. Tool of modern life	Already a tool of modern life	Increasingly as tool of modern life	A tool of modern life, even in rural communities	Use has grown rapidly in last 6 months. No longer a luxury but a tool of modern life	Seen as a tool, but for business only	Increasingly as tool of modern life	Still a luxury and sign of high social status

Question	Poland	Czech Rep	Slovakia	Hungary	Bulgaria	Albania	Romania	Croatia
What ICT courses are available in higher education?	Most universities, all 14 Polytechnics, and some private high schools teach a wide range of computer, IT and micro-electronics courses.	All universities offer courses in basic computing and technical universities offer courses in computer science and, for example, information engineering.	University of Žlina and Slovak University of Technology in Bratislava. Other universities have specialist IT courses related to their fields.	The Budapest Technical University, various high schools and bodies linked to the Academy of Sciences all over computer science courses	'Informatics', 'information technologies', 'electronics and micro-electronics' etc in 8 technical universities in the capital and major provincial towns	Computer Science is weak since it did not exist in the communist years. Universities run basic courses, as do private companies	Computer Science departments in major universities	No data
How many people graduate from them annually?	250 from Warsaw Polytechnic alone. Many leave for good jobs before graduation.	All graduates (200,000) are expected to be PC literate	Approx 300 students each per year enter in field as a whole. No completion statistics.	Data is available for numbers starting courses, not completing them	1000 graduates in total per year	No data	No data	No data
What is the availability of labour with ICT qualifications or experience?	There is a shortage of ICT trained staff.	There is a severe shortage, partly because of employment in Germany. Salaries 2-3 times the average, even more for those with Java and C++ skills	Shortage because of high demand and possibility to work abroad. Domestic salaries well above average.	Labour shortage (25% more jobs than people available), partly because people take on jobs abroad. Salaries are 4-5 times average wage.	No shortage is reported of people with ICT skills, and salaries are not exceptionally high. People with such qualifications cannot always find work in their chosen profession	There is a shortage of ICT staff, but their salaries are no higher than those for other service sector workers, accept in foreign companies	No shortage reported. Qualified professionals are available for what western investors see as low salaries	Shortage of ICT qualified labour

3.7 Impediments and Possible Solutions

Our review of the literature suggests two matters of concern:
- Reasons given for reluctance to use the Internet include the high costs of dial-up charges. In the Czech Republic, Slovakia and Hungary there have been user 'strikes' to put pressure on the phone companies. In the Czech Republic these were organised by the ISPs.
- Reasons given for reluctance to buy over the Internet include security considerations. (For a time fraud was so extensive in Bulgaria that Compuserve and AOL refused to offer their services there in case they were associated with computer fraud.)

We invited our respondents to suggest three areas for priority action. The responses had several themes:
- the costs of Internet access, particularly the phone charges which are high as a percentage of local salaries in both the Central European countries (one hour of Internet access in the Czech Republic was said to cost 0.5% of a monthly salary[9]) and Bulgaria.
- the need for public access points in more remote areas in telecentres of similar institutions
- the importance of ICT training, both for children and the adult public
- the need for more teaching of English as the international language of the web, and
- the disparities within the region, with the Albanian and Bulgarian respondents pointing to areas of need (fundamentals of networks and connectivity and better penetration into central and local government respectively) which are already realities in Central Europe.

A further point made by respondents was that, even in countries with relatively good ICT infrastructures, the quality of many phone lines remains poor and transmission speeds slow, making dial-up access to the web a cumbersome process.

A summary of the findings of our questionnaire on this topic (with a different selection of respondents) is given on the following pages.

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[9] Our calculations suggest that this may be a slight overestimate, but that the figure in Albania, Latvia, Lithuania and Poland would be higher. The EU average figure, but contrast, is about 0.13%.

Questionnaire Responses - Section 7: Impediments and Solutions							
Question	Poland	Czech Rep	Slovakia	Hungary	Bulgaria	Albania	Romania	Croatia
What are the main obstacles to greater govt use of the Internet?	Need for physical signature and rubber stamp	Conservatism in government offices.	Need for a physical signature and rubber stamp	Need for physical signature and rubber stamp. Most official documents still typed	Need for a physical signature and rubber stamp	Need for paper based authentication, low penetration of PCs, insufficient phone lines	---	---
Priority One	Facilitate better access to the Internet	Reduce the costs of accessing the internet, especially the phone charges. One hour on Internet costs 0.5% of average monthly salary.	Promote telecentres in villages and smaller towns	Reduce the costs of accessing the internet by providing cheap public access points and training centres (telecentres) and also reducing price of hardware	Increase the penetration of ICTs into central and local government	Fundamentals of remote networking and connectivity for public institutions like schools	Increased use of Internet in public administration to improve transparency of government	Internet access in schools
Priority Two	Introduce real competition into the telecoms market	Support the introduction of ICTs to rural areas and rural schools.	Support cheaper access to Internet for local authorities and small businesses	Reduce the costs of accessing the Internet, particularly charging calls by the minute. Telephone lines are too slow for good internet access	Develop government services via the web	Subsidised Internet access for such institutions and high profile individuals	Extension of ICT services to sphere of medical provision	Public education programme to promote use of Internet

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Question	Poland	Czech Rep	Slovakia	Hungary	Bulgaria	Albania	Romania	Croatia
Priority Three	None suggested	Promote measures for life-long learning in ICTs so that citizens can keep pace with new developments	Extend Internet access to elementary schools	Improve the quality of English teaching both at schools and through adult education courses	Develop the teaching of English and ICTs in rural areas.	Access and training in big cities other than the capital to increase awareness and explain benefits of ICTs	Improve Internet access in rural areas.	Free public access to Internet via libraries

4   Other international donors

In addition to the stakeholdings of international companies (mostly EU based consortia consisting of telecoms operators – see section 3), there are a number of programmes of financial and technical assistance helping to establish a more liberal and profitable market in telecommunications in the countries of central and south eastern Europe. The following are brief descriptions of the main activities of government-based/non commercial organisations which are active in the region.

EC Phare Programme

All EC Phare programmes provide grant aid on a non-commercial basis. There are two types of programme for telecommunications - National (including cross-border) and Multi-Country. The national programmes have focussed on government ministries, assisting in the regulatory reform process in preparation for eventual accession to the EU. The Multi-Country Programmes have been influential in applying EU-type models to the region by running projects, staffed by EU telecoms experts, that can be joined by at least 3 of the countries. In this way, regional rather than national solutions are found to common problems, thus maximising the potential benefits of the assistance. The projects are well defined, highly participative and practical. The European Commission awards these technical assistance contracts by competitive tendering.

A total of euro 67.57 million has been committed during the period 1990-1999, of which euro 49.92 million has been on National programmes and euro 17.65 million on Multi-Country programmes.

Phare Telecoms National and Multi-Country Programme Expenditures (millions of euro)

Program-me Year	'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	TOT.
Albania					1.70						1.70
Bulgaria		2.10	1.80	0.95	0.41					2.50	7.76
Czech R.			2.40								2.40
Hungary					0.53	1.00					1.53
Latvia			0.60	0.20							0.80
Lithuania											0.00
Poland	6.00	5.00		2.00						2.20	15.20
Romania			2.60	3.00		12.00					17.60
Slovakia			0.80	1.00							1.80
Slovenia			0.71	0.37		0.05					1.13
Multi-Country			7.00		1.00	2.70	3.85	3.10			17.65
TOTALS	6.00	7.10	15.91	7.52	3.64	15.75	3.85	3.10		4.70	67.57

(Source: Warsaw Telecommunications Conference, January 2000)

The following Multi-Country telecommunications projects have been completed;-
- Preparation of legislative and regulatory documents
- Establishment of independent regulatory authorities
- Preparation of rural telecoms models and running of pilot projects
- Establishment of the first Telecentres
- Pilot of fixed/mobile solutions in conjunction with universal service funding for rural areas
- Launch of new telecoms services in 8 countries, including Televoting, Freephone, Centrex, Voicemail
- Developing business plans
- Business process design and implementation

- Development of licensing models
- Preparation of interconnection agreements
- Measurement and management of service quality
- Adoption of type approval practices for telecoms equipment
- Cost allocation tools
- Identification and removal of barriers to investment
- Translation of EU directives into local languages
- Telecommunications tariff models
- Training in strategic management
- Project management training
- English language training

New proposals for the continuation of Phare assistance are being considered. These involve the following countries

Lithuania	Drafting of secondary telecommunications legislation
	Establishment of regulatory authority
	Training of local regulatory staff
Poland	Certification and standards for telecommunications equipment
	Functioning of universal service obligation and its funding
	Conformity assessment to EU accession requirements
Slovakia	Regulatory reform
Slovenia	Assistance to regulatory authority
Bulgaria	Introduction of "112" Emergency call number
Latvia	Conformance to EC directives on terminal equipment
	Organisation of standardisation work

The EC Reconstruction Programme for Bosnia and Herzegovina

The telecommunications network in Bosnia and Herzegovina was severely damaged during the war. A basic requirement of the Dayton/Paris Peace Agreement of 1995 was the reconnection of the inter-entity telecommunications network. The former State-owned enterprise of PTT BiH has been split into three companies, each of which claims monopoly over the three communities.

The EBRD leads a Telecommunications Task Force in Bosnia and has developed a master plan to reconstruct local networks, national networks and switching. The EC programme is assisting the process of re-unification through projects that provide digital inter-entity links between the Muslim-Croat Federation and the Republica Srpska plus a range of basic telephone services for the community, businesses and state organisations. Since 1996, the EC has committed euro 16 millions to telecommunications reconstruction.

All remaining projects are close to completion. The EC has concluded that the telecommunications sector is strengthened and profitable enough to carry on using appropriate loan funds rather than grants. In future, the EC takes the view that the telecommunications sector in Bosnia and Herzegovina would be assisted by the EBRD and potential commercial investors.

This withdrawal approach in Bosnia-Herzegovina is in line with the EC's current policy in towards telecommunications in central and eastern Europe as a whole.

The World Bank

The following major ongoing telecoms projects are being funded by The World Bank Group: -

Bulgaria	Implementation of the digital overlay network. Design and implementation of a computer-based operational support/management information system. Assistance to national operator (BTC) for organisational development, accounting systems, auditing, financial management and planning.
Romania	Reform of the telecommunications sector and support to privatisation. Establishment of a national regulatory agency.
Slovakia	Construction of a long-distance digital overlay network. Support to transition through training and institutional support, especially in the fields of financial management, human resources management and market orientation.
Kosovo	Creation of a fully functioning budget management system within the interim government of Kosovo. Establishing a full bank licensing and supervision capability within the Banking and Payments Authority.

Further information on World Bank policies and programmes is provided in Annex E.

The European Bank for Reconstruction and Development

The EBRD is involved in both public and private sector projects in CSEE. The following list includes the approved, signed and disbursed telecoms projects as at 31 December 1999.

Private Investments

Albania	Albanian Mobile Communications	$5m
Czech Rep.	Kabel Net	$2.5m
	Eurotel Praha Spol. S.r.o.	$10.9m
Macedonia	Emergency GSM project	$18.7m
Hungary	CGE Hungary Regional Telcom (Deltav)	$28.4m
	Digitel 2002 Rt	$19.3m
	Westel Radiotelefon KTF	$9.9m
	HTC Equity investment	$50.9m
	Investel Syndicated Loan Facility	$15.8m
	Hungarian Commercial television	$13.2m
Latvia	Latvia GSM Mobile Comms	$22.9m
Poland	Netia	$23.7m
	Polska Telefonica Komorkowa sp z.o.o.	$23.7m
	TPSA	$64.9m
Romania	MobiFon II – Romania GSM	$9.9m
	Emcom-Siemens	$6.2m
	Romtelecom Transition Project	$98.8m
	Mobifon I – Romanian GSM	$96.7m
Slovakia	Eurotel Bratislava Spol s.r.o.	$7.9
	TOTAL VALUE OF PRIVATE FUNDING	$529.3m

There are also 3 regional projects, total value $61.8 million, involving Barings Commercial Equity, Info & Comm Fund and Golden Telecom. This brings total current private funding for the region to $591.1 million.

Public Funding

Albania	Albania Telecom	$9.7m
BiH	Telecom Emergency Rehabilitation Prog.	$18.1m
Bulgaria	Bulgarian Telecom	$32.0m
	Eurovision – Bulgaria	$1.0m
Czech Rep.	Czech Telecommunications Project	$42.6m
Estonia	Eurovision – Estonia	$0.9m
Macedonia	Macedonian Telecommunications Project	$41.9m
Hungary	Hungarian Telecommunications Project	$33.6m
Latvia	Eurovision – Latvia	$0.9m
Lithuania	Telecom Development International	$24.7m
Romania	Rom Telecom	$142.0m
	Eurovision – Romanian Project	$1.0m
Slovakia	Slovak telecom Project	$44.0m
Slovenia	Eurovision – RTV Slovenia	$1.0m
	TOTAL VALUE OF PUBLIC FUNDING	$393.4m

The total of public plus private funds for telecommunications is $984.5m, which is 66% of the total EBRD telecommunications funding for the whole of the central and eastern Europe and the Commonwealth of Independent States.

In a press release, issued on 14th February 2000, the EBRD reaffirmed its commitment to the region.

> *"As people buy more telecoms services, an incredible number of opportunities are emerging for Western investors. The EBRD hopes to invest around Euro 150 million this year in the region's telecommunications sector"*

> *"The marketing and sales potential of the Internet and the growth of electronic business has prompted a strong expansion in the Information Technology market. The newly developed Universal Mobile Telecommunications System (UMTS) will provide further opportunities for the EBRD to participate in mobile telephone projects"*

> *"There are growing opportunities for us to encourage the development of new services, such as Internet services, e-commerce, satellite communications and media in general. But the development of the informatics and media sectors will be highly dependent upon the availability of personal computers and reliable networks for businesses and homes to fully enjoy such new products"*

Other organisations engaged in relevant activities in the region include USAID and the Soros Foundation. Some information on their policies and programmes is provided in Annex E.

5   Opportunities and threats

5.1   Introduction

From the outset of this project it has been known that there is tremendous variation among the 16 countries covered, and our research findings have amply confirmed this. This concluding chapter nonetheless aims to provide an overview which will be valid for most of the region, or at least for substantial parts of it. All that follows must be understood in this light. The phrase "with some exceptions" should be permanently present in the reader's mind, but after this initial warning will not be repeated.

Overall, the picture we have uncovered of ICT penetration and use in the CSEE region is positive. Compared with other countries of similar income levels, ICT penetration is fairly high and is growing rapidly. The value of ICT is widely recognised, and attitudes towards ICT are open and receptive. The population, enjoying a high standard of education, is generally well-equipped to take advantage of the opportunities offered by the new technologies.

But the proviso of "similar income levels" is a vital one. Income is everywhere significantly lower than in Western Europe, and in the poorer countries is at levels comparable with some countries of central America or even of sub-Saharan Africa. In common with other countries, economic liberalisation is bringing about growth but also growing inequality. Reliance on market forces alone will not deliver the benefits of new technologies to large segments of the population within decades. The widely-recognised potential of ICT to foster economic enterprise and social participation for all will not be achieved in the foreseeable future without intervention.

We have identified a collection of actions in this arena which we believe are worthy of consideration because they have one or more of the following characteristics:

- making a significant contribution to poverty reduction, equity and/or social inclusion;

- low cost, or otherwise easy to achieve;

- likely to support the efficiency or effectiveness of other socially valuable activities such as health care or education;

- using skills and experience in which the UK is especially strong.

What, if any, types of intervention may be appropriate to undertake is a matter for those concerned to decide, in the light of such factors as:

- available budgets and other resources;

- relationships with other international and commercial funders;

- national commercial and public relations objectives;

- synergy (or lack of it) with other regional activities envisaged or already committed.

Section 2 of this chapter gives a fuller discussion of our findings in the format of a SWOT (strengths, weaknesses, opportunities and threats) analysis of the CSEE's regional characteristics

that are most relevant to ICT, while section 3 contains the actions which we recommend for consideration.

5.2 SWOT analysis

This section briefly summarises some of the major points arising from our study of penetration and use of ICTs in the CSEE region under the headings of strengths, weaknesses, opportunities and threats. All should be understood in the light of the overall goals of poverty reduction and increasing equity and social inclusion.

Strengths

For the prevailing income levels, there is a **relatively high penetration** of ICT. The telephone is widely seen as a basic essential. Payphone provision is generally good, complementing domestic and mobile telephony to the extent that most people can use a phone if they wish, and many are in the habit of doing so.

Rapid growth in demand is generating strong commercial interest in the region's ICT markets. Both commercial and non-commercial lenders (not least EBRD) are active in facilitating market participation by many Western companies.

In preparation for eventual EU accession, **EU regulatory standards** are widely accepted as the goal, and several countries are well on the way towards achieving them. Full market liberalisation is planned, though countries are in various stages of implementation.

As part of the inheritance of the Communist era, there is a **high general level of education**. This includes rural populations, who on average are better educated (and have traditionally been less reliant on agricultural occupations) than their Western European counterparts. It also includes women and the elderly.

There is also a good base level of **specialised ICT skills**, though it needs enhancing and complementing in various ways (see "Opportunities" below).

There is widespread **recognition of the importance of ICT**, including sound official policies in various stages of implementation. In particular, most **educational institutions** and libraries either have internet access or are targeted to get it within the next few years.

The need for improved ICT infrastructure in the region has been recognised by the **international donor community**, and efforts in this arena are being supported already in various ways.

There is an existing successful community **telecentre organisation** in a few countries, and pilot telecentres in others.

Weaknesses

The prevailing **low income levels** put household access to advanced ICT out of reach of a significant part of the population for the foreseeable future.

The era of co-operation in adversity is nonetheless coming to an end, with the pendulum swinging towards **individualism,** making shared use of scarce ICT provision a less attractive proposition.

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Throughout the region, **rural areas suffer relative deprivation.** Rural teledensities are well below national average figures, and in some countries many villages are entirely unconnected. Traditional rural poverty has been exacerbated by many former industrial workers resident in the countryside becoming unemployed since the end of Communism.

Entrenched bureaucracy remains widespread. The perceived need for physical paperwork may present an obstacle to realising the potential efficiencies offered by ICT in administration.

The **Roma** constitute the main underclass throughout the region. They are an exception to the generally high level of education, and since the end of Communism are experiencing very high unemployment.

In parts of the Balkans, **law and order** are lacking to the extent that restoring them is a necessary prelude to other actions.

Opportunities

As shown under "Strengths" above, most **conditions are favourable** for the success of ICT-based activities. Existing penetration, public and official attitudes, general and specialised education, and the market and regulatory situation, are all positive.

The region's commercial potential points to a clear possibility of obtaining **commercial funding** for some non-profit undertakings. This may be for the sake of good public relations, or with an eye to long-term profit (especially if some complementary public funding is available).

Use of the Internet by the organisations of **civil society** offers great opportunity for making them stronger and more effective. They can be in closer touch with their counterparts elsewhere in the region and the world, becoming aware of shared problems and possible solutions; and can promote themselves and their ideas much more widely. Good communications for such groups may be the best future guarantor of hard-won independent democratic institutions.

ICT access offers people the prospect of **diversified employment opportunities** which could help to replace employment lost following the collapse of Communism. This is especially relevant in rural areas where ICT access is poorest.

ICT deployment offers considerable potential for support to other **social welfare programmes**. For example, it can make educational or healthcare initiatives more effective and/or more efficient.

Because the UK liberalised its telecoms market early, ICT is an area where the UK has considerable **comparative advantage** relative to the rest of Europe. The UK is especially well-placed to offer many kinds of ICT-related expertise that are needed in CSEE, for example regulatory support, e-commerce facilitation, applications of ICT in government, and telecentre operation. English language training and translation is another obvious area of CSEE need and UK strength.

By the very nature of ICT, even minor actions in their support can generate useful amounts of **favourable publicity** for the donor.

Threats

There is by now considerable evidence from many countries that untrammelled market forces in ICT are not tending to close "digital divides". While growth is rapid, it is focused on high-spending customers and businesses. Without intervention, we have no reason to expect a different outcome in CSEE. Rather, **the market will increase inequality**, with a fortunate upper stratum becoming wired and well-off. The rest will also progress in absolute terms but at a slower rate, so that their relative position will get worse.

Low income levels were mentioned as a weakness. The commercial necessity of tariff rebalancing in telecoms to cover costs (which is essential to attract investors) may exacerbate this problem by raising the price of basic telephony service to levels which are **no longer affordable** by many.

Rural poverty without the reviving power of ICTs will lead to an **exodus to cities** and a depopulated countryside, with all the accompanying problems that are familiar from other countries.

Dire conditions among the Roma will cause **increasing disorder** and migration (including illegal immigration to the UK).

Other Western countries' agencies will exert their own influence in this area, **overshadowing the UK.**

Discussion

The points collected above are of widely varying size and importance. Our subjective overall assessment however is that taken as a whole the picture is positive – that the strengths and opportunities outweigh the weaknesses and threats. They add up to a clear case for intervention in this area. The positive reasons for this are stronger than the negative ones – that is, doing nothing and thereby missing the opportunities would be more serious than allowing the threats to develop.

5.3 Actions for consideration

The actions that we have identified for UK Government to consider undertaking in this area are divided into three main categories: infrastructure building, skills development and ICT applications. A fourth general category cuts across these three. Plainly, not all actions will be equally appropriate in all countries. In particular, adequate infrastructure has to precede applications using that infrastructure. For example, there is no point making government easily accessible via the Internet unless a substantial proportion of the population will have Internet access and the skills and confidence to use it for dealings with government.

Below we list and describe the actions, and in the figure provide our qualititative assessment of them in the following dimensions:

- Support for the primary goals of poverty reduction, equity and social inclusion (high, medium, low)

- Potential synergy with other initiatives promoting social welfare (high, medium, low)

- Use of UK special skills (high, medium, low)

- Speed of producing an impact (high=short-term, medium=medium-term, low=long-term) (with the terms roughly understood as 1 to 2 years, 3 to 7 years, and 8 years or more).

- Cost (high, medium, low) (assuming the action is carried out across all appropriate countries. Costs can obviously be reduced by acting in a subset of countries; however we do recommend acting on a multi-country basis wherever practicable, especially in the Balkans, to encourage co-operation).

Potential actions

Infrastructure building

1 Support to regulators for rural telecoms development

One obvious opportunity for intervention is to provide more help to regulators to deal with the issues they face, particularly in relation to telecom developments in rural areas[10]. This would include help on such issues as whether to offer local franchises in rural areas, how to provide other incentives for telecom developments in rural areas etc. Regulators in the CSEE countries all have a basic understanding of regulation, not least because they have been involved with various Phare projects, but they appear to need help in turning the principles into practice. In addition, the rural areas may not naturally be the main focus of regulators' objectives, and there would be a role for the UK in providing help to regulators in such a way as to raise the priority of rural areas on the regulatory agenda.

For example, while regulators will undoubtedly be guided in what they do by the principles of telecommunications regulation in the EU, if they were to make a concerted effort to develop rural telecoms, they would probably have to wrestle with the following set of inter-related issues:

- Should rural areas be subject to a special licensing structure, e.g. rural telecoms franchises, and if so whether these would be exclusive (and if so for how long) or a duopoly in competition with the dominant incumbent or subject to full competition

- If rural areas are to be treated differently, how is "rural" defined? (The Phare project on alternative models for rural telecom development defined "rural" as "any area with less than the national average telecoms provision". Some of these areas were unquestionably in towns, e.g. the Student City district of Sofia, where telecoms provision is apparently very poor). Is there a case for licensing by type of technology (contrary to EU policy), e.g. licensing a wireless local loop company for rural areas while forbidding the incumbent to use the same technology, at least for a certain period?

- What are to be the service or access obligations of licensees or franchisees in the rural areas? If the obligation is expressed as "every village with over X population must have at least 1 public telephone", what date is attached to this, and how does the regulator work out what the right date is?

- How is the licensee's obligation in relation to affordability of telephone service to be defined in the rural areas (e.g. in absolute terms, or relative to average incomes)? Would be the definition for rural areas different from the national definition? Should the licensee be required to offer a choice of tariff, and if so on what lines?

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[10] Poor areas of cities may often also merit similar attention.

- Should entrants in the profitable markets in the main towns have obligations in the rural areas as well (as in, for example, the Philippines)?

- What is the cost to the licensee of the service or access and affordability obligations as defined? How much cost is it reasonable to impose on the licensee?

- How far can the licensee be expected to bear the cost of these obligations without being compensated, e.g. because the licensee earns undeserved profits elsewhere which the regulator can't deal with? What are the undesirable side-effects of this cross-subsidy?

- If the licensee is to be compensated, how? e.g. a universal service or access fund. Who controls this, and how does the regulator ensure that the fund is protected from raids by the Treasury in the next government budget crisis? How are the payments into the fund levied, i.e. what percentage of what sum (PSTN revenues? telecom revenues? profits?)? Are payments from the fund to be made automatically to the incumbent, or should there be an element of bidding for the funds, with the winner being the company asking for the lowest subsidy?

- How far will getting the big national issues right (e.g. cost-based interconnect, tariff rebalancing) assist the rural areas?

2 Support telecentre organisations

Individual telecentres typically require $15-20,000 initial capital plus an operating subsidy for the first two years. Telecentres have been successful when they are founded in response to local needs and enthusiasms, and they have failed when they have been funded centrally and established without taking account of local requirements. Consequently there is a great diversity of successful business models for telecentres, although they all have the common themes of being a community centre with a number of different functions, of which providing access to telecommunications is but one. Given the scale of the requirement and the diversity of business model, the management burden in assisting many individual telecentres would be considerable.

We therefore suggest that a UK Government Department should provide assistance through national telecentre organisations. National telecentre organisations already exist in Hungary and Estonia. We suggest that national telecentre organisations should be established in other CSEE countries, probably with the help of either the Hungarian or Estonian association. (The Hungarian association already has an international department dedicated to assisting telecentres outside Hungary). We also suggest that, once the national organisations are established, these organisations should be helped to replicate best practice from other CSEE countries and from outside the region.

3 Support libraries as public internet access points

Libraries are already well established as a community information resource, and an extension of this role by the provision of public internet access will seem natural to many. Our short survey has shown that already some authorities in the region are moving in this direction. The British Council's existing involvement provides a good basis for future progress in this area.

4 Facilitate development of e-commerce legislation

The first step would be to contact the responsible ministries in the CSEE countries to ascertain whether they would welcome any assistance on e-commerce legislation or whether other donors are already funding this. If assistance would be welcomed, the next steps are:

- Compare laws in the CSEE countries with relevant EU directives and regulations, including any Commission proposals for revisions of which we may be aware (e.g. from Commission website). The most relevant EU Directives on e-commerce with which to compare CSEE laws are probably these:

    Electronic Signatures Directive

    E-Commerce Directive

    Distance Selling Directive

    Distance Marketing of Financial Services Directive

    Data Protection Directive

- There would be no need to look at the e-commerce laws in each EU Member State. But our examination would not be limited to EU laws currently in operation since we would want to look ahead and help the CSEE countries to accede to the EU as it will have become by the time of accession.

- Draw up a gap analysis indicating the deficiencies in each participating CSEE country's laws.

- Devise, in consultation with the countries concerned, a programme to fill those deficiencies, and propose this to a UK Governmnet Department for funding. Such a programme is likely to involve providing one or more experts in EU e-commerce law and local experts who can advise on how the new legislation should be drafted so as to fit in with the local legal tradition.

5 Help provide virtual telephony for Roma

Virtual telephony is the facility for recorded phone messages to be received on an individual number and retrieved via any telephone. It is in effect a network-based voicemail system. Callers to the voicemail will be unaware that they have not dialled an ordinary fixed number, and will probably assume that the person they have dialled has gone out and left an answering machine on. In conjunction with public payphones, it provides one-way voice communications at very low cost. An enhanced version of the service entails a pager to alert the user to incoming messages.

Virtual telephony is proving quite popular among some low-income groups. For example, it is successful in both Chile and Botswana, and is being provided in the USA and the UK to some homeless people and to job seekers. It enables them to have a presence in modern society so that employers and family members can make contact with them easily. As it involves no fixed wires, it seems well suited to members of the Roma community who may require some form of communications.

6 More detailed data on Balkan infrastructure

We are only too aware of the generally poor state of telecoms infrastructure in much of the Balkans, but during this study have been unable to gather up-to-date information at an adequately disaggregated level to be a foundation for action. In particular, we have found no independent data on Kosovo and little on F R Yugoslavia. Given the UK desire to support the revival of this troubled area, a full understanding of its telecoms needs seems a highly desirable early step.

Skills development

7 Enhance commercial awareness of graduates

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8 Help to update IT teaching in universities

9 Help to integrate ICT into school curriculum

These three possible actions are all clearly needed in many parts of the region. UK educational institutions have vast quantities of relevant experience and would be well placed to contribute it to help fill the need in CSEE. However, it is important to note that the need is great, and probably outside the capability of any one donor country to fulfil. Other Western countries are also well-equipped to help, and co-operative programmes are most likely to succeed.

10 Promote "English for Internet" language training

The British Council's in-country teaching is either rather general or aimed at helping people pass the IELTS test so that they can study at a tertiary educational institution in the UK. The teaching is not currently aimed at helping people to learn the sort of English that they need in order to make better use of the internet. However, the fact that it exists at all is a useful start. With more UK support it could be built upon and re-oriented to help more people exploit more of the assets of the Internet.

ICT applications

11 Roving project team to pilot ICT delivery of public services

We found fledgling examples in CSEE of the use of ICT for the delivery of public services (eg applications for car licences in Poland), but clearly there is a long way to go towards the adoption of current best appropriate practice throughout the region. Establishing and then publicising good pilot schemes is probably the best way to demonstrate the potential benefits and economies.

The UK can hardly claim to lead in implementing electronic service delivery, although it does have some excellent examples to its credit and specialised expertise to share.

12 Help establish social welfare telephone helplines

Providing advice, support and counselling services over the phone is a good way of getting social value from existing technology. Such services can reach more people more quickly than those provided via the internet. They are beginning to be provided in some parts of CSEE, but there is undoubtedly scope for great extension.

This is an area where the UK appears to have more experience than any other European country, and its Telephone Helplines Association, which acts as a centre of expertise for member helplines, is probably unique in the world.

13 Help civil society organisations connect to Internet

A rapid extension of internet access to all households in CSEE is impracticable. Extending it to the majority of organisations of civil society is however a more reasonable goal, and one which could greatly strengthen these organisations to the general benefit of society.

Organisations which might be targeted include:

- community radio stations

- consumer organisations
- voluntary social welfare and youth groups

Some already have Internet access. It gives them the dual abilities of:

- communicating easily with one another and with their peers elsewhere in the world, and being in touch with relevant news and developments;
- promoting themselves and their messages to the world (especially valuable for community radio, which could provide a link with the diaspora).

Providing internet access to suitable Roma community organisations (following a review of what organisations exist, how effective they are, and what use they are already making of the Internet) could, for example, be another way of helping the Roma.

14 Help develop acceptable means of electronic payment

The lack of credit cards in the region is perceived as a major impediment to the growth of electronic commerce. However, credit cards are in any case not the most appropriate payment mechanism for the high-volume, low-value transactions which may be more likely to succeed in relatively low-income countries. Alternative forms of electronic cash are being developed in the Western world, but may need adaptation for success in the CSEE environment.

The Juice Pay precedent in the Czech Republic is interesting. As far as is known, no announcements have been made about whether it is a success. Juice Pay may not be an appropriate model for other countries. Nevertheless it should be investigated to see whether it could be the basis of a similar scheme in other countries. While Citibank (the proprietor of Juice Pay) may have an incentive to replicate the Juice Pay scheme in the wealthier countries of the region, it may be that the UK could take a lead in establishing similar schemes in the less wealthy areas so as to promote the development of ICTs on an inclusive basis.

15 Investigate machine translation

Machine translation technology is as yet in an early phase of development. A UK Government Department may wish to look further into the state of the art in order to decide whether it may be worth its while to support either:

- application of existing machine translation techniques to translate English into CSEE languages, or

- advancement of existing techniques. This is a more ambitious goal, but one that could in principle be of value to all regions, not just to CSEE.

Translations out of the local language into English in order to publicise the goods and services of companies in the CSEE region are unlikely to be helped much by machine translation in its current state, because such translations must be near-perfect for the message to be credible. While machine translations may be adequate for some technical purposes, they are inadequate for the subtleties of marketing messages. In any case, most companies will not be changing their web advertisements all that often, and so it will be possible for them to obtain proper translations of their material from time to time in the traditional way.

However, machine translation would be of considerable value to non-anglophones for translations out of English, to give them access to all the material on the web in English. While a machine

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translation is unlikely to produce translations to a standard that a speaker of the target language would regard as acceptable for republishing locally, it is reasonable to expect machine translation to produce a translation good enough to understand the sense of a document in some detail. Such assistance would therefore enable companies and researchers in Eastern Europe to have both rapid and deep access to the latest developments in their field in the anglophone world.

Unfortunately machine translation is not as highly developed between English and the languages of Eastern Europe as it is for pairs like English-French or English-German. We therefore suggest that contact be made with the developers of machine translation software to explore what their priorities are for developing new language pairs and whether their timetables can be accelerated.

General

16 Find commercial partners for some initiatives

This strikes us as a clearly desirable action. To make it more concrete, we offer the following draft terms of reference for a work package to pursue non-profit sponsorship opportunities. A parallel project could investigate the scope for partnership in projects with a potential profit element.

<u>Aim</u>   To investigate the potential for western private sector sponsorship of investment in ICT-based projects in CSEE countries.

<u>Objective</u>   To ascertain whether the will exists for such private sector sponsorship of ICT investment and consequently whether there is a possibility of UK Government co-sponsorship deals for such projects.

<u>Approach</u>
To undertake a pilot study in a selected CSEE country to test the extent to which western companies active in that country are willing to use their budgets for charities, good causes and sponsorship to support ICT-based projects in the areas adjacent to the site of their operations. "Support" here means that the company would regard its financial and other contributions not as something done with a view to profit, as part of its mainstream business, but more as a donation in the interests of displaying good corporate citizenship and neighbourliness, improving public relations, etc (in which case the amounts of money involved would be considerably smaller than its usual investment projects).

In addition to approaching companies active in the ICT sector, companies with extensive operations in rural areas and other parts of the country with a particular ICT need should be investigated. Thus the ICT project need not necessarily have any relationship to the sponsor's business. The suggested country for a pilot study is Poland because of the size of the country, the large number of foreign investors already present, and the country's rather backward position with regard to telecoms and ICT.

The investigation entails the following:
1)   Desk research in the UK to establish the identity of significant foreign investors in the chosen country and the location of their main factories or plants
2)   A visit to the chosen country to interview, with the help of a native speaker, senior company management responsible for the budget for charities, good causes and sponsorship. The purpose of the interviews would be to ascertain whether they have funds at their disposal locally, the size of such funds, how and when decisions about allocation of these funds are taken, and whether the management might be interested in using them for an ICT project in the area where they operate. The interviews would also seek to ascertain the extent to which company participation would be more likely if a UK Government Department were able to prepare and suggest projects which could be sponsored jointly
3)   In cases where the local management does not have significant resources at its disposal, approach the company headquarters, by phone or in person. The purpose would be to ask the same questions of the person or persons with overall corporate responsibility for the budget for charities, good causes and sponsorship

Summary of actions for consideration supporting ICT in CSEE

Action	Goal sup-port	Syn-ergy	UK skills	Speed of impact	Cost
Infrastructure building					
1 Support to regulators for rural telecoms development	H	H	H	M	M
2 Support telecentre organisations	H	M	M	M	L
3 Support libraries as public internet access points	M	M	M	M	M
4 Facilitate development of e-commerce legislation	M	M	H	M	M
5 Help provide virtual telephony for Roma	H	M	M	H	L
6 More detailed data on Balkan infrastructure	M	M	M	H	L
Skills development					
7 Enhance commercial awareness of graduates	M	L	H	H	L
8 Help to update IT teaching in universities	M	L	H	M	M
9 Help to integrate ICT into school curriculum	H	H	M	M	H
10 Promote basic English language training	M	M	H	M	M
ICT applications					
11 Roving project team to pilot ICT delivery of public services	M	M	H	M	M
12 Help establish social welfare telephone helplines	H	H	H	H	L
13 Help civil society organisations connect to Internet	H	H	M	H	M
14 Help develop acceptable means of electronic payment	M	L	H	L	M
15 Investigate machine translation	?	?	H	?	L
General					
16 Find commercial partners for some ICT initiatives	-	-	-	H	L

Note: ? indicates that the action is of an exploratory nature, such that its contribution in this dimension cannot yet be assessed. – indicates that the action is too general to assess in this dimension.

UK Government's preferred choice from this collection would presumably score high in the first four assessment columns and low in the last (cost). Nothing quite achieves this ideal. Our comments on possible choices are:

- Numbers 1, 5, 12, and 13 seem to offer high or rapid returns for reasonable outlay and we hope that they will be considered seriously.

- Number 4 is likely to be more costly but could be very rewarding.

- Numbers 6 and 16 are of an exploratory nature and we recommend that they be undertaken: they are low cost and are likely to be fruitful.

- The outcome of number 15 is highly uncertain, but it could have quite far-reaching results for a low outlay.

Annex A Data on fixed and mobile infrastructure in Europe

Contents

(Other data has been taken directly from the
sources which are referenced in the report)

Table 1   CSEE FIXED-NETWORK COMMUNICATIONS at the end of 1998

Country	Population (millions)	GDP per head ($)	Main lines	Lines per 100 Population	Digitalisation % of Main Lines	Growth Rate % per annum
Albania	3.6	1046	115200	3.2	69	32.4
Bosnia	3.7	931	592000	16.0		
Bulgaria	8.4	1449	2940000	35.0	8	8.9
Croatia	4.5	4467	1575000	35.0	75	5.0
Czech Republic	10.3	5223	3708000	36.0	64	12.4
Estonia	1.5	3750	498780	32.6	48	6.4
Hungary	10.2	4801	3396360	33.2	81	9.6
Latvia	2.5	2701	743400	29.5	30	-0.6
Lithuania	3.7	2830	1097400	29.5	24	4.7
FYR Macedonia	2.2	1600	451000	20.5		
Poland	38.6	4016	8800800	22.8	60	17.3
Romania	22.7	1440	3583440	15.8	41	5.4
Slovakia	5.4	3611	1516880	28.3	62	8.3
Slovenia	2.0	9949	746250	37.5	75	3.4
FR Yugoslavia	10.5	1182	2184000	20.8		
TOTAL (15 Countries)	**129.8**	**3144**	**31948510**	**24.6**	**54**	**11.8**

(Sources: Questionnaires, Economist, Public Network Europe, World Telecom Online)

Table 2 Western Europe FIXED-LINE COMMUNICATIONS at the end of 1998

Country	Population (millions)	GDP per head ($)	Main lines	Lines per 100 Population
Austria	8.0	26482	3944500	49.0
Belgium	10.1	23894	4908600	48.6
Denmark	5.3	33917	3344300	63.1
Finland	5.1	24952	2886600	56.6
France	58.6	24952	33698000	58.1
Germany	81.6	26056	45940800	56.3
Greece	10.5	11752	5355000	51.0
Ireland	3.6	23486	1500020	41.9
Italy	57.5	20388	26790000	47.0
Luxembourg	0.4	44931	247520	59.5
Netherlands	15.5	24326	8525000	55.0
Norway	4.4	33822	2332000	53.0
Portugal	9.9	10921	3979800	40.2
Spain	39.3	14932	17292000	44.0
Sweden	8.8	27382	5975200	67.9
Switzerland	7.0	36306	4620000	66.0
United Kingdom	58.6	24685	30472000	52.0
TOTAL (17 Countries)	**383.1**	**23191**	**201811340**	**52.7**

Table 3   CSEE MOBILE COMMUNICATIONS at the end of 1999

Country	Population (millions)	GDP per head ($)	Mobile subscribers	Penetration %	Growth % 1998-1999
Albania	3.4	1046	11000	0.3	96
Bosnia	3.8	931	72300	1.9	54
Bulgaria	8.2	1449	330000	4.0	159
Croatia	4.5	4467	391577	8.7	109
Czech Republic	10.3	5223	1950000	18.9	103
Estonia	1.4	3750	368000	25.6	50
Hungary	10.1	4801	1630000	16.1	54
Latvia	2.4	2701	284244	11.7	72
Lithuania	3.7	2830	339000	9.2	6
FYR Macedonia	2.2	1600	49130	2.2	23
Poland	38.7	4016	4030000	10.4	96
Romania	22.5	1440	1360000	6.0	120
Slovakia	5.4	3611	951000	17.6	78
Slovenia	2.0	9949	628780	31.8	289
FR Yugoslavia	10.6	1182	669040	6.3	81
TOTAL (15 Countries)	**129.2**	**3148**	**13064071**	**10.1**	**89**

Table 4   **Western Europe MOBILE COMMUNICATIONS at the end of 1999**

Country	Population (millions)	GDP per head ($)	Mobile subscribers	Penetration %	Growth % 1998-1999
Austria	8.1	26482	3980000	49.1	81
Belgium	10.1	23894	3150000	31.2	81
Denmark	5.3	33917	2500000	47.2	45
Finland	5.2	24952	3200000	61.9	23
France	58.6	24952	20300000	34.6	84
Germany	82.5	26056	23500000	28.5	74
Greece	10.5	11752	3800000	36.2	85
Ireland	3.7	23486	1250000	33.8	59
Italy	57.5	20388	29600000	51.5	45
Luxembourg	0.4	44931	209364	50.3	61
Netherlands	15.6	24326	3430000	22.0	24
Norway	4.5	33822	2700000	60.0	36
Portugal	10.0	10921	4300000	43.1	72
Spain	39.4	14932	14200000	36.0	97
Sweden	8.9	27382	4900000	55.1	32
Switzerland	7.1	36306	2885000	40.7	75
United Kingdom	59.3	24685	24500000	41.3	89
TOTAL	**386.7**	**23191**	**148404364**	**38.4**	**67**

Table 5 Supplementary CSEE statistics

Country	Total Popul-ation (million) 1999	Popul-ation per km^2 1999	GDP per head ($) 1998	Internet hosts per 10000 popul-tion 1999	Internet users per 10000 popul-ation 1999	Estim-ated PCs per 100 popul-ation 1999	Incoming minus outgoing inter-national dialled minutes as % of outgoing 1998	Growth rate in total incoming and outgoing dialled minutes, 1996-98 (%)	Incoming minus outgoing inter-national dialled minutes (millions) 1998
Albania	3.85	134	742	0.56	6.49	0.40	6	52	3
Bosnia	3.84	75	898	5.81	9.12		68		64
Bulgaria	8.28	75	1470	20.33	179.94	2.66	100	53	96
Croatia	4.48	79	3973	22.47	446.33	11.16			
Czech Republic	10.26	130	5418	119.13	682.12	10.72	28	20	90
Estonia	1.45	32	3588	208.24	1383.53	13.49	5	30	4
Hungary	10.21	110	4651	117.18	587.66	7.35	26	23	78
Latvia	2.44	38	2602	77.38	430.43	8.20	57	27	32
Lithuania	3.70	57	2899	38.35	278.28	5.94			
FYR Macedonia	2.01	78	1613	7.39	149.17		147	-3	55
Poland	38.74	124	3703	44.20	542.07	6.20	90	50	542
Romania	22.4	94	1846	16.20	66.74	1.34			
Slovakia	5.38	110	3787	52.37	1300.71	7.43	23	15	35
Slovenia	1.99	98	9796	118.46	1257.02	25.14	6	22	7
FR Yugoslavia	10.64	104	991	9.91	94.03	1.88	93	14	204
Europe (45 countries)	798.56	31	12059	125.91	860.82	14.55			

Source: ITU, TeleGeography Inc.

Slovenia cellular figure is for 1998

Next page:

Table 6   International traffic matrix for CSEE countries

Millions of minutes of dialled telephone traffic, 1998

Notes to table 6:
1   A blank indicates that the destination is not in the top 20 destinations from that country (from Albania, not in the top 14; from Hungary, not in the top 10)
2   Croatia data not available for 1998. Destination ranking relates to 1995.
3   Lithuania data not available.
4   Traffic from Macedonia to FR Yugoslavia probably not recorded as international.
5   In most cases, traffic to the top destination alone is many times traffic to CSEE destinations.

	to Albania	Bosnia	Bul-garia	Croatia	Czech Rep	Estonia	Hun-gary	Latvia	Lithu-ania	FYR Maced-onia	Poland	Rom-ania	Slov-akia	Slov-enia	FR Yugo-slavia	Top destin-ation	Traffic to top destin-ation	2nd destin-ation
from																		
Albania	-	0.2		0.2							0.5			0.9	2.2	Italy	18.7	Greece
Bosnia		-		25.5							0.1					Croatia	25.5	Ger-many
Bulgaria			-		1.6		1.2			2.6		3.4			8.5	Greece	12.5	Ger-many
Croatia	note 2	note 2	note 2	-	note 2	note 2	note 2	note 2	note 2	note 2	note 2	note 2	note 2	note 2	note 2	Ger-many	note 2	Bosnia
Czech Republic				2.2	-		4.4				13.3		65.6			Ger--many	78.2	Slovak Rep
Estonia						-		5.2	2.9		0.8					Finland	21.0	Russia
Hungary							-					17.9			8.1	Ger-many	73.0	Austria
Latvia					5.1			-	6.0		1.2					Russia	15.4	Lithu-ania
Lithuania	note 3	note 3	note 3	note 3	note 3	note 3	note 3	note 3	-	note 3	note 3	note 3	note 3	note 3	note 3	note 3	note 3	note 3
FYR Macedonia	0.8	0.7	3.2	2.1	0.4					-				2.1	note 4	Ger-many	5.5	Bul-garia
Poland					14.9		5.8				-					Ger-many	233.8	UK
Romania			1.1				7.7					-			1.5	Ger-many	20.5	Italy
Slovakia				1.1	62.8		7.7				4.5		-		1.1	Czech Rep	62.8	Ger-many
Slovenia		6.1		31.3	1.4		2.3			3.4	0.8			-	13.2	Croatia	31.3	Ger-many
FR Yugoslavia		10.5	2.1	22.6						8.9			2.3		-	Ger-many	41.1	Croatia

Table 6 International traffic matrix for CSEE countries   Please see previous page for explanatory notes

Annex B   Supplementary regulatory and legal information

This annex is in two parts. The first part offers further detailed notes on the legal and regulatory position relevant to ICT development in the region for Poland, Hungary, Bulgaria and Slovenia. The second provides some information on the regulatory approaches adopted to foster rural telecoms development in three countries of south-west Europe – Italy, Spain and Portugal.

Poland

Poland is one of the largest telecoms markets in Central and Eastern Europe. In the light of recent regulatory amendments, there is anticipation of a further sale of share in the national incumbent Telekomunikacja Polska (TPSA). With a new telecoms law likely to be in place this year, the market will be encouraged to expand further. The markets for mobile telephony, wireless in the local loop (WiLL), CATV, and data communications are of particular interest to foreign investors. The fixed-line market is also opening up to competition. In 1999, the lower chamber of the Polish Parliament adopted an amendment to the Communications Act to enable the State Treasury to reduce its interest in TPSA below 51%. The lower chamber also adopted an amendment to the Communications Act to authorise the State Treasury to authorise the Ministry of Communications to expand the scope of telecoms licences. The amendment allows the Minister of Communications to grant, without a public tender, DCS 1800 licences to the current GSM 900 operators, Polkomtel and Polska Telefonica Cyfrowa, as well as a GSM 900 licence to PTK Centertel (in which TPSA holds a 66% interest).   There are recent reports that the Polish Government is thinking of awarding 5 UMTS licences.

The 1990 Law on Communications, amended in 1995, governed the market in Poland through the 1990s but proved to be increasingly obsolete. A new Communications Law is to be introduced in 2000, which should come into force probably later this year. The new law is expected to:

- create an independent regulator
- establish a universal service obligation
- allow telephone number portability
- eradicate cross-subsidisation, end tariff distortions in the market and move to a cost-based system more in line with the EU
- grant cable television operators the right to offer voice telephony
- leave as it stands the 2003 deadline for the ending of Telekomunikacja Polska SA (national incumbent)'s monopoly. Licences for international calling are not expected to be granted until late in 2002.

The old law, the Telecommunications Act 1990 ("PT Act"), requires both a licence for providing telecommunications services and a permit for installing and using a telecommunications network. Neither of these can be granted to any foreign entity or to a company with foreign participation. However, this is subject to a number of exceptions:

- the licence and/or permit may be granted to a company with foreign participation in which the foreign capital does not exceed 49% of the aggregate value of the share capital;
- the articles of association must contain provisions such that (a) the members of the company's management board shall in the majority be Polish citizens domiciled in Poland (b) the number of votes held by a foreign entity shall not exceed 49% of the aggregate.

Also under the old law, there is no effective regime for setting interconnection rates (which often account for 40% of a new entrant's/competitor's costs) and complex procedures for coming to settlement.

However, the Polish Telecoms Minister has announced that Poland might be ready to open up its international telephone calls market to competition earlier than the planned date of 2003. A tender for licences to operate intercity telephone services was launched last year. Up until 1999, Telekomunikacja Polska had the exclusive right to provide both international and intercity services. In December 1999, the Minister of Communications issued an Order increasing the powers of the State Radiocommunications Agency to issue telecoms licences. Also, certain restrictions in the Polish Law on Communications regarding the issue of permits to foreign-owned or controlled entities have now been relaxed. The changes relate to permits for the installation and operation of: (a) radio communications equipment; and (b) ground equipment used by satellite networks in connection with mobile communications. Although this is not a major driver for change, it should be welcomed by foreign investors.

As regards the internet, as of September 1999, there were approximately 150 ISPs (according to World Markets Research Centre, WMRC, 1999). The number of internet subscribers was around 1.5 million at this time, although this figure will no doubt have increased. TPSA offers a free dial-up service, but is considered slow and unreliable. The incumbent is reconsidering its internet provision and is planning to launch a new service this year. Other major ISPs in the country include Netia (which is reported to be in talks with Polbox on a free internet access service along the lines of Freeserve in the UK or Czech OnLine in the Czech Republic), and the public body, the National Academic Computer Network (NASK), formerly the monopoly ISP, which has been attacked because of its public/private status.

The Polish strategy on telecoms has been very different from that of Hungary, and would appear to have been less successful. The foreign ownership lid of 49% has been a major impediment to foreign investment and only Polish companies can be licensed to install or operate international telecommunications networks of any kind. However the new law should abolish the ceiling on foreign investment and bring in much needed foreign capital. It should also be noted that there are no restrictions on foreign participation in local networks. (In 1999, according to WMRC, 80% of local telephone lines were operated by companies with a degree of foreign ownership). No dominant foreign investor has yet emerged in the market although Telia and Deutsche Telekom are strong.

Forecasts

	1998	1999	2000	2001	2002
Teledensity	22.7	25.9	29.2	32.6	35.5
Cellular penetration	5.4%	9.2%	13.2%	17.1%	20.9%
Digitalisation	60%	72%	78%	85%	91%

Source: Salomon Smith Barney

The EU's critical opinion on the Polish telecoms markets (along with those of other accession candidates) can be read at http://www.europa.eu.int/comm/enlargement/docs/index.htm.

Hungary

The Hungarian telecoms market is probably the most liberalised in Central and Eastern Europe. Hungary offers a range of opportunities to foreign investors in an environment of increasing economic stability and regulatory independence. Since 1990, Hungary's attitude to foreign investment has been one of the most open in Central and Eastern Europe. The datacommunications and mobile sectors are particularly advanced and a number of players are preparing to enter the fixed-line sector ahead of its full demonopolisation in 2002.

A recent report by the OECD (December 1999) has found that reform of Hungary's telecoms regulations is progressing well. A new comprehensive Act on Communications is due to bring Hungary in line with the EU. The Act will introduce a 'universal service' requirement that all households who wish and can afford it must be provided with a certain level of telecoms service and is expected to establish the Communications Authority (HIF) as an independent regulator.

Up until the end of 1999, the Ministry of Transport, Telecommunications and Water Management (MTTW) regulated the telecommunications sector in Hungary. The Communications Authority performed the administrative functions and reported directly to the Ministry. In May of this year, however, the government announced that the supervision of the telecommunications and information technology sector would be transferred from the Ministry to the Prime Minister's Office, where a government commissioner will head the department.

In November of last year, a new bill to regulate cable television companies was submitted to the government. The new bill will also regulate voting rights and restrict equity ownership of telecom companies within cable television companies. It was also in November that the draft outline of the new Hungarian Communications Act was sent to the government agencies for review. At that time, the (then) body responsible for telecommunications, the MTTW, also adopted a new decree on the Licensing and Controlling of Telecommunication Establishments. The new decree should correspond with the provisions of the Telecommunications Act.

In June of this year, the government announced that the Consolidated Telecommunications Bill ("EHT") could be submitted to the Parliament by this autumn and possibly come into force in the spring of 2001. Regulations concerning the postal system could be removed from the proposals. The current proposals for the bill on cable television, which are now before Parliament, will also be included in the EHT. The latest version of the EHT can be downloaded from the Communication Authority (HIF) web-site.

Telecoms

The national incumbent Matav will retain the monopoly on international and long-distance fixed-line telephony until 2002. Last year however, the government discussed with Matav the possibility of brining the termination of the monopoly forward to 2001 in return for concessions on new licences and frequencies. The parties are still in discussion, but in the interim Matav plans to increase the penetration rate, aiming for an overall teledensity of 40 by the end of this year.

The increasing willingness of the government to end Matav's monopoly a year early has stimulated the competitiveness of the telecoms sector. The government also plans to end the regional monopoly of the five independent operators Matav, Matel (the second largest fixed-line operator),

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Pantel (49% owned by KPN), CG Sat-Matel (5/6% owned by Alcatel), and the Hungarian Telephone and Cable Corporation by 2002.

Tariff rebalancing is now at an advanced stage and should be complete by 2001. In May this year, the Communication Authority (HIF) announced that it was co-operating with service providers in designing a scheme for calculating interconnect fees based on real costs. According to the HIF, the new scheme could be completed by the end of this summer and will probably change this year's interconnect fees. Cost-based interconnect to Matav is expected to be introduced this year ahead of the full liberalisation of the market. Also the interconnection fees for mobile to fixed are to be in line with EU levels by 2001 - a drop of between 75 and 90%.

Mobile

The mobile market is in a state of dynamic growth. In May of this year, the daily newspaper, the Magyar Hírlap, reported Westel 900 as having 1.09 million subscribers, Pannon GSM 800,000 and Westel 450 100,000 subscribers. Vodafone, the third mobile network operator, estimated an (unofficial) figure of 70,000 subscribers. If the market expands at the same pace during the rest of the year, a total of one million new subscribers are anticipated to go mobile, and the total number of GSM cellphones will reach more than 2.5 million by year-end.

In July, the government announced that the AirTouch/RWE consortium had been awarded the Hungarian DCS 1800 licence. The SG-Sat/Mannesmann consortium's bid was ranked second, with the Orange/ Callahan Associates International consortium bid a very close third. With a licence fee of HUF 48,500,000,000 (US$ 203,320,208) the licence is the most expensive mobile radio telephone licence in Europe. Half of the fee is to be paid in approximately one month and the other half must be paid in approximately 15 months. Airtouch and RWE must now form a Hungarian company and give 25% plus one vote interest in it to Antenna Hungaria and Magyar Posta Rt.

Internet

The Hungarian Parliament has not yet determined the regulatory environment for internet telephony. However, in May 1999, the MTTW granted PanTel a licence for international voice services over the internet but nevertheless restricted interconnection with the PSTN. As such international VoIP services will only be available to private networks of leased lines and closed user groups. PanTel is the first company in Hungary to apply for permission to operate IP-based voice transmissions. Leased-line resale, public switched data transmission services, and the operation of closed-loop networks are open to foreign investment. The Communication Authority (HiF) has given PanTel permission to launch its PanPhone service which carries national calls initiated on terrestrial or mobile telephones through the internet.

In May of this year, the Inter-ministerial Committee for Information Technology approved the launching of two new projects in connection with the publication of the electronic data of the public administration. One project is the establishment of a government portal. The other, DEKO, will set up a central database-handling system for the regional state administrative organs.

The situation on broadening the protection of copyright is also underway. Last year, the Hungarian Parliament discussed amendments to the Criminal Code expected to enter into force this year. This will be the first time that the Hungarian criminal law has addressed Internet related issues and the inclusion of the Internet within the Criminal Code.

Hungary is also making progress with new e-commerce laws. In May, the government announced that the drafting of the bill on electronic signatures is proceeding as scheduled. An Infrastructure

Ministry advisory committee approved the main points of the draft bill in March. The bill is expected to go before Parliament in November. An amendment to the Act on Accounting, effective from January 1, 2001, will exclude acceptance of electronic invoices unless e-signatures legislation is in place by that date.

Also in May, the Heads of the four largest stakeholders in the Hungarian ISP market signed a letter of intent to establish an association to promote the development of the Internet and the online economy, the information society and to improve the efficient representation of their markets and their clients.

Based on the IT Commissioner's proposal, a system of electronic public procurement will be developed by 31 January 2002. On implementation, invitations for tender and related information will be available. Also the participants of public procurement procedures will be able to submit their bids via the Internet.

In line with developments in e-commerce and data protection laws in the EU, the government has decided that data such as name, address, amount payable, and phone number are considered to be personal data. Pursuant to the Act on Data Protection, personal data may only be transferred upon the approval of the data subject.

Competition

Hungary also has an established competition authority which is proving to be very effective. In July, the Competition Office established that Matáv had abused its dominant position by providing international voice telephony over Internet Protocol ("iVoIP") services exclusively to the local telephony operators (LTOs) and mobile telephone service providers and excluding the other telecommunications service providers. The Competition Office fined Matav HUF 5 million .

Bulgaria

Bulgaria is a market of increasing interest to foreign investors despite several disappointing years of activity in the telecoms market. A new telecommunications law was passed in 1998 which has stimulated rapid growth across all sectors of the market. Disputes between the government and strategic investors (KPN and OTE) in the PTO, BTC, caused some to speculate that the sale would not be completed. The need to get a waiver from the European Commission for the extension of the monopoly period, which KPN/OTE sought as a condition of the deal, led to further delay. However a management agreement has now been reached with the Bulgarian Government.

The level of transformation in the market now depends to a great extent on the success of the privatisation of BTC. Bulgaria is unusual compared with other CSEE states in that it reformed its regulatory environment before inviting foreign interest in BTC.

The new Telecommunications Act became law in August 1998. The Act will bring Bulgaria into line EU standards, and under the Act, the independent State Telecommunications Commission (STC) will take over the role of the Committee of Posts and Telecommunications (CPT) as the major regulator for the industry. The CPT now only executes the state's telecoms policy, whilst the STC has taken over licensing and regulatory issues. The Act can be read at http://www.btc.bg/btc/topi.htm

The role of the STC is to promote services and competition, monitor licence conditions, and protect the consumer. The old system of concessions that allowed BTC to dominate the market will gradually be replaced with a licence driven policy that is expected to limit BTC's influence.

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Telecoms

Rebalancing is yet to be achieved, with slow progress being made by BTC. BTC aims to have tariffs rebalanced by 2002. The second phase of the government's programme for the modernisation of telecoms infrastructure is due to be completed by 2010. Aimed primarily at broadening access, BTC is targetting a 75% digitalisation rate by 2010, and teledensity of 43. Sofia will be 100% digitalised, large cities 85%, and small towns and villages 45%. The government hopes to match EU standards with this effort.

Under the new Act, PTOs are generally not allowed to reject a reasonable application for interconnection. The PTOs will have to conclude interconnection agreements and publish technical interface standards. As a commitment to transparency (one of the main principles underpinning the regulation of interconnection in the EU under the Interconnection Directive 97/33), interconnection agreements have to be lodged by the PTOs with the STC. The STC has the power to have the agreements amended. The STC also has the power to insert detailed requirements into PTO licenses with respect to equal and unbundled access to share network resources.

Internet

The CPT has decided to keep interconnection fees for ISPs minimal. ISPs had protested strongly against an initial decision to charge fees that would come to between 20% and 40% of their profits, forcing up charges passed to the consumer. BTC has tried to monopolise internet interconnection to Bulgarian users. However the Bulgarian Courts have been asked to resolve disputes between BTC and other operators. The development of internet services has created problems with the allocation of domain names and IP addresses. The government is keen to follow the guidelines of the EC and the ETO/CEPT on domain names and IP addressing. The data communications sector is probably the most competitive area of the telecoms market and companies can operate private and public data networks under licence from the CPT/STC, but must lease transmission capacity from BTC until 1st January 2003.

However in 1999, Reuters reported that the Bulgarian cabinet had adopted changes in the Telecommunications Law to allow the BTC to exercise exclusive rights over the Internet in addition to its telecommunications monopoly. There have also been unconfirmed reports of KPN/OTE (foreign equity holders in BTC) asking the government to stop issuing licences for corporate network construction. These would underpin the concerns that many foreign investors had over KPN/OTE's aggressive demands to the government to extend the BTC monopoly for fixed-line services for long distance and international calls to 2004.

As to developments in e-commerce, in January this year, the Economic Chamber announced that it is to guarantee signatures on the Internet. In a contract signed with Global Star the Chamber gets exclusive rights to offer digital certificates in the territory of Bulgaria. The certificate will guarantee Internet messages and the identity of the sender.

Mobile

So far growth rates in the mobile sector have been low, particularly in contrast to Hungary and Poland, but with the award of a new GSM licence in 1999, subscriber growth should be stimulated. GSM will replace NMT as the dominant standard. The government estimates a 5% cellular penetration by 2001. The two main players are Mobiltel (50% owned by the United European Bank as at September 1999) and Mobikom (39% BTC, 49% C&W, and 12% Radio Electric Systems as at September 1999).

Slovenia

Foreign investors have been reluctant to enter Slovenia's small telecoms market throughout the 1990s. This has been mainly due to a perception that the Slovene government has exercised discriminatory practices, mainly in the award of cellular licenses, for example the award by the Ministry of Transport and Communications of the first GSM licence to Mobitel, a subsidiary of the national incumbent Telekom Slovenijie (TS). However, with Slovenia anxious for EU accession by 2004, the mood for liberalisation has picked up and the telecoms market is expanding, particularly in datacommunications.

Telecoms

The lifting of TS's fixed-line telephony monopoly by 1st January 2001 should give the market a significant boost. All other telecommunication services were liberalised by the law in June 1997. Competition is expected to be fierce post 2000. Slovenia's aim is to raise its teledensity to around 43 by next year. A fully digitalised network is planned for this year, which will make it one of the most advanced in Central and Eastern Europe. Slovenia also has two international exchanges, in Maribor and Ljubljana. Via the Slovenian Optical Cross, the country links Croatia and FRY with Austria, Italy, and the remainder of Western Europe, and connects Italy to East Europe. As such TS is aiming to become a key transit area for Balkan connections. Hungary poses the greatest competitive threat to this goal. Slovenske Zeleznice (the railway monopoly) and ELES (the electricity monopoly) are both thought to be considering mounting a challenge to TS post 2000.

The sale of a stake in TS should provide a marked boost to the entire telecoms market in the country. However rebalancing has proved to be slow and the EU has criticised the Slovenes' slowness. According to the Telecommunications Law 1997, interconnection agreements are negotiated by contract. If a contract cannot be agreed, the dispute is referred to the MTC (Ministry of Transport and Communications). Under the Telecommunications Law, sector specific legislation is handled by the Telecommunications Administration of the Republic of Slovenia (URST). One of the problems is that the URST is a body of the MTC. The URST however is expected to become an independent entity within the next four years.

The Telecommunications Law 1997 provides for the liberalisation of leased line, cable, mobile, datacomms and satellite sectors. The full text of the law can be read at http://www.gov.si/urst. One of the effect of the law has been to make the regulatory environment much more transparent and no longer subject to abuse by TS. The high entry barriers facing foreign investors have been lowered significantly, and by the end of 2000, the government's strategy is that TS's share of the market should have fallen to 54%.

Internet

Slovenia has one of the best developed internet industries in Central and Eastern Europe. There are over 30 specialised internet companies providing a number of services. There are over 180,000 active users (about 1% of the population between 14 and 65). Over 80% of large companies and over 50% of small companies have access to the internet. Almost 10% of all Slovenian companies, and about 20% of large companies have their own websites. There are over 24,000 internet hosts (all figures according to the World Markets Research Centre as at September 1999).

TS has a dominant position in the market for internet access and runs the Slovenia Online service, the leading service provider. It may be spun off in the mid-term. E-mail is also provided by the Smail 400 X.400 service. Slovenia Cable Interconnect is also to provide internet access.

Overview regulatory summary of selected Eastern European countries

Regulator	Regulatory strategy	Important regulations
Slovenia		
Telecommunications Administration of the Republic of Slovenia (URST)	Currently under the Ministry of Transport and Communications (but to be fully independent within 5 years). The regulator and government were severely criticized for a lack of progress by an EC report in 1998. Since then, performance has improved.	Telecommunications Law of 13th June 1997 provides for liberalisation of leased-line, cable, mobile, datacoms and satellite sectors. Establishes the end of Telekom Slovenijie's monopoly on fixed-line telephony by year end 2000.
Bulgaria		
State Telecommunications Commission	The STC has now almost fully taken over the role of the Committee of Posts and Telecommunications (CPT). The STC can issue, alter, supplement, suspend, terminate or revoke the licenses. The second phase of the government programme for modernisation is to be completed by 2010. The Government hopes to bring Bulgaria to EU standards by this date.	Telecommunications Law 1998. The constitutional court of Bulgaria has confirmed that the state monopoly on the PSTN and on universal service exercised by the incumbent BTC does not contradict the Bulgarian Constitution.
Hungary		
To year-end 1999, the Ministry of Transport, Telecommunications and Water Management (MTTW) regulated the telecoms industry. The Communications Authority of Hungary performed various administrative functions. From 2000 however, regulatory responsibility has been transferred to the Prime Minister's Office, where a government commissioner will head the department. However, under a new Communications Act (see next column), regulatory responsibility should fall to the Communications Authority as an independent regulator.	Under a new Communications Act, regulatory responsibility should fall to the Communications Authority as an independent regulator. The Act will introduce a universal service requirement that all citizens must be offered a certain level of telecoms service. Tariff rebalancing is at an advanced stage (expected completion in 2000) and overall the regulatory framework is well developed. The rules for the negotiation of interconnection agreements are also well defined.	Consolidated Telecommunications bill should be submitted to Parliament in the Autumn of 2000 (coming into force in Spring 2001). Provisions for the regulation of cable telephony will also be included in the bill.
Poland		
The regulatory environment is in a state of flux. The Ministry of Posts and Telecommunications is thought to be the principal regulator (and is independent of the national incumbent TPSA), but a new communications law is likely to create a new independent regulator. Disputes between operators have also appeared before the Competition and Consumer Protection Office (UOKiK).	Specific government plans include: gradually rebalancing tariffs, lowering long-distance and raising local rates; privatising a large part of TPSA; encouraging foreign investment, especially in rural areas. Tariff rebalancing has been modest, starting in earnest in 1998. The Ministry of Posts and Telecommunications predicts that one in four subscribers will belong to a private network by year-end 2000.	Telecommunications (PT Act) 1990. However a new Communications Law is expected to be in place in 2000. Beside other issues the new law is expected to establish a universal service obligation - if a customer requests a line, the operator is obliged to provide one or face a fine.

Regulatory approaches taken by Italy, Spain and Portugal to licensing

Looking at the regulatory approaches currently adopted within CSEE gives a good sense of where these countries have got to, but rather less of where they should be going. To understand the available options, it may be more helpful to look at actual practice within the EU.

We therefore offer below a brief summary of such issues in Italy, Spain, and Portugal, all countries with large rural populations, which have not all yet enjoyed modern telecoms services for many years. We describe where appropriate the kind of milestones that regulators may consider as part of the licensing framework.

Italy

Financial commitments/build obligations

Licences for new operators normally contain obligations tied into a five year business plan. These may include: an obligation that share capital is equal to 10% of the intended total investment for the five year plan; and an obligation to post a performance bond in the form of a bank guarantee equal to approximately 15% of investment planned for the first five years.

A licensee is obliged to keep a performance bond in place to guarantee that it will fulfil undertakings (which it must give in its licence application) on coverage, infrastructure investment, research and development and employment[11]. The licensee will have to submit reports at the end of each financial year to demonstrate that it has met its targets. If one or more targets have not been achieved, the Ministry of Communications has a discretion to enforce the performance bond. The Ministry <u>must</u> enforce the bond if the targets are missed by more than 5%. The maximum amount that can be taken from the performance bond is 20% of its value. This has been challenged as a barrier to competition and market entry. The policy is unlikely to change in the short term but may relax over time.

Either a network licence or a voice telephony licence is likely to give the right to interconnect at wholesale prices. However, it seems that these rights may be limited to areas in which the operator has a point of presence (including a rural region).

Individual licences are necessary (among other things) in order to:

- provide voice telephony services;
- establish and provide public telecommunications networks;
- provide mobile services;
- acquire radio spectrum allocations; and
- acquire numbering allocations.

It is interesting to note the position of Italy as regards the way the regulator there differentiates the value of licence fee paid by the number of people served in a region (which could include a rural region). For example, based on a draft ministerial decree of 5 February 1998, licence fees are as follows:

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[11] The value of the bond is (A+B+C-D) multiplied by 0.15 (where A is the cumulative infrastructure investment in the first five years, B is the amount of expense occurred/investment made in the first five years, C is the net working capital at the fifth year, and D is the corporate capital fully paid up at the time of the granting of the licence).

Licence coverage	one-off fee (million lira)	annual fee (million lira)
National	100	120
<10 million people	40	50
<200,000 people	20	20

Spain

The licensing regime is based on the scheme of general authorisations and individual licences set out in the Licensing Directive. Individual licences are required for

- building or running telecoms networks;
- providing public switched voice telephony;
- establishing mobile networks or offering mobile services (and other services requiring spectrum allocation); and
- other activities designated by special Royal Decree (e.g. where there are limited resources).

Obligations under new network licences to build infrastructure are to be determined by secondary legislation under the LGTel (telecommunications law). A point of presence may be required in a province (such as a rural region, as opposed to the City of Madrid for example) for an entitlement to interconnect in that area.   Similarly, most licences/authorisations will not require specific financial resources to be available. However the law requires a public tender to choose operators who will gain an individual licence for basic voice telephony services. When the tender is awarded, the regulator will set out financial obligations.

Access deficit

The payment of access deficits are covered by a ministerial order of 18 March 1997, which states that companies holding a share of between 10% and 15% of a relevant market must contribute to the access deficit. Exact contributions will depend on subscriber numbers and accounting issues. The concept of waivers does not appear to exist. However the law states that access deficit payments will eventually be abolished under Section 4 of the draft LGTel. The issue is interesting however in that it shows how a country with large rural areas has used access deficit contributions in the early stages of infrastructure development.

Universal service

Who has the obligation? This has never previously been an issue because basic telephony was provided by the monopolist, Telefonica, currently responsible for maintaining universal service. Under the new law, any dominant operator (Telefonica until 2005, and thereafter any operator with more than 25% of the market within a specific area) may be designated to provide universal service.

If there is a fund, who has to contribute? There will eventually be a universal service fund. It is as yet unclear exactly who will be required to contribute; but initially, contributions will be determined on the basis of the respective turnovers of individual operators. Further regulations are needed to define exactly how the fund will operate.

Portugal

Licensing

Portugal had a derogation from compliance with EU law until 1 January 2000. The provision of non-voice services is liberalised, but public voice remained a monopoly until this date.

Licence requirements are broadly the same for providers of any regulated telecoms services. Applicants/licensees must be Portuguese companies; they must demonstrate adequate technical capacity and financial resources. In particular, at least 25% of their planned investment must be in equity rather than debt. They must have fully updated accounts, and be able to demonstrate that they have no debts to tax/social security authorities.

Universal service

The state is obliged by law to ensure that there is provision for universal service. It seems that the obligation will eventually be determined by a public tender process. Universal service costs will be shared by public voice operators. Further regulation is awaited in this area.

Annex C   Supplementary information from questionnaires

Albania

0   ISPs
Albania Online – www.albaniaonline.net – tel. +355 4251122
ICC – Intellectual Communications Center – www.icc.al.eu.org or www.icc.al.org – tel. +355 4250520
ADANET – www.adanet.net
Interalb – www.interalb.com or www.interalb.net.com.al
Abissnet – www.abissnet.com.al

Bulgaria

Proportion of expenditures for "Communication" in Total Money Expenditures, on average per household (%)

Year	Percent
1992	0.9
1993	1.1
1994	1.1
1995	0.9
1996	1.0
1997	1.3
1998	1.5

Source: Household Budget Statistics in Republic of Bulgaria. National Statistical Institute, Sofia, 1998, p. 6-7. (This is the latest publication)

Post, telegraph and telephone network in Bulgaria by District, end 1997

District	(1)	(2)	(3)	(4)
Total	3,081	3,118,817	2,276,602	8,283,200
Sofia - city	126	620,705	374,781	1,190,547
Bourgas	336	279,044	205,980	834,367
Varna	328	343,158	252,566	891,877
Lovech	473	407,206	315,088	971,938
Montana	309	200,027	161,882	603,024
Plovdiv	369	416,109	310,422	1,199,423
Rousse	345	263,943	204,548	748,839
Sofia-district	448	314,107	241,313	953,335
Haskovo	347	274,518	210,022	889,850

Source: Statistical Yearbook of R Bulgaria. National Statistical Institute, Sofia,1998.
Legend:
(1) Post, telegraph and telephone stations, number
(2) Telephone posts (lines) - number
(3) of which household telephone lines
(4) Population

Note: Unfortunately, this is the latest publication. Since 1997 the situation is considerably improved.

Companies - Rila Software

Rila was established in 1998 as a joint stock company established between George Soros and the Bulgarian Telecommunication Company. It employs 70 Bulgarians and has branches in Boston, New York, Washington D.C., Paris, London and other cities. 70% of its work is carried out in Bulgaria, but 80% of its work comes from sales offices in the US. It specialises in Oracle, Microsoft and IBM technologies.

Croatia

Companies - Iskon

Iskon is a Zagreb-based Internet service provider. In April 2000, its fortunes changed drastically, when Adriatic Net investors—a Texas-based investment fund specializing in Internet companies throughout Central and Eastern Europe—bought up 51 percent of the company making Iskon the first Croatian Internet company to receive significant foreign investment. Croatian Internet development has lagged behind its potential, and the telecommunications industry is still dominated by the state-owned company Croatian Telecom (HT). Iskon was founded by Damir Sabol in September 1997. Sabol had worked as the systems administrator for Zamir Net, a non-profit electronic network established in 1992, with the help of a $50,000 grant from the Croatian branch of the Open Society Foundation (OSF), for the various anti-war and human rights groups operating throughout the former Yugoslavia. During the war in Croatia and Bosnia, Zamir's online bulletin boards were often the only line of communication between non-governmental organizations in Zagreb, Sarajevo, and Belgrade

County Telephone Penetration Figures

County	Total Population 1991 Census	Number Of Telephones In Residential Apartments 1998
Zagreb County	1,060,815	387,360
Krapinsko-Zagorska	148,779	34,622
Sisacko-Moslovacka	251,332	45,597
Karlovacka	184,577	39,989
Varazdinska	187,853	47,675
Koprivnicko-Krizevacka	129,397	33,921
Bjelovarsko-Bilogorska	144,042	36,854
Primorsko-Goranska	323,130	116,356
Licko-Senjska	85,135	16,643
Viroviticko-Podravska	104,625	25,707
Pozesko-Slavonska	99,334	21,191
Brodsko Posavska	174,998	42,562
Zadarska	214,777	49,679
Osijecko-Baranjska	367,193	85,424
Sibensko-Kninska	152,477	35,642
Vukovarsko-Srijemska	231,241	49,136
Splitsko-Dalmatinska	474,019	139,690
Istarska	204,346	73,303
Dubrovacko-Neretvanska	126,329	38,800
Medjimurska	119,866	29,609

Information from the 1991 census had to be used. The war has ocurred since then, which means that the data should be interpreted carefully.

Croatian ISPs

HINET: www.hinet.hr   tel: +385 62 077077
ORBIS: www.orbis.hr   tel: +385 42260824   e-mail: orbis@jadran.com

HINET general usage statistics

Date & Time This Report was Generated	Thursday June 01, 2000 - 16:33:29
Timeframe	05/01/00 00:00:00 - 05/31/00 23:59:59
Number of Hits for Home Page	173827
Number of Successful Hits for Entire Site	34332398
Number of Page Views (Impressions)	3723282
Number of User Sessions	1026210
User Sessions of Unknown Origin	100%
Average Number of Hits per Day	1107496
Average Number of Page Views Per Day	120105
Average Number of User Sessions per Day	33103
Average User Session Length	00:12:01

Czech Republic

Mobile phones

For the Radiomobil (Peagas) network, see www.radiomobil.cz (click Pokrytí). For Eurotel, see www.eurotel.cz (click mapy).

Computer-related companies

AutoCont (www.autocont.cz), ProCa (www.proca.cz) and Comfor (www.comfor.cz) control 55.6% of the Czech market for PC sales.

Software602 (WWW.software602.cz; or www.software602.com) continues as a software company and has expanded into Internet applications, having made its name writing the first Czech word-processing programme for PCs.

SPRINX s.r.o firm generating Internet/intranet solutions began to collaborate with Microsoft in February 1997, eventually setting up a new server www.atlas.cz, which then in October 1999 became a new server portal MSN.ATLAS.CZ (http://msn.atlas.cz), part of international MSN network.

The only IT company in the Czech top 200 companies is PVT a.s. at number 110. The company's roots lie in the communist years, although it is registered as being founded in 1991. It is a system integrator, operator and seller of IT and data networks.

Czech ISPs

The full list of the Czech Republic's 50 ISPs can be found on:
http://sgi.felk.cvut.cz/~prikryl/providers.html

Alternatives to credit cards

Juice Pay: Prague, Citibank a.s., the Czech banking subsidiary of Citigroup has announced the launch of Juice Pay, a pioneering payment card designed specifically for purchases over the Internet that will enable merchants to accept on-line payments conveniently and securely from their customers. Juice Pay is part of the world of Juice, the WAP and web portal created by EuroTel spol. s r.o., the Czech Republic's leading mobile phone operator. Juice Pay cardholders are not required to be either Citibank or EuroTel customers. Juice Pay cardholders face no annual fees or transaction fees. The only requirement is that they cardholders have a bank account in the Czech Republic from which they can transfer funds to their Juice Pay card.

Expandia Banka is the country's first internet banks and many e-shops offer the possibilities of payment via this bank. An English website can be found on www.ebanka.cz.

Hungary

Computer Sector Companies

Elender: The company began by selling medium-capacity PC but changed direction with the arrival of the Internet. It became an Internet provider, won the contract to set up the school network (sulinet) and by the late 1990s was the country's fourth largest ISP. In September 1999 the company was bought by PSINet Inc, Elender's founder becoming head of its Hungarian operations, and nine months later it was announced that the company would no longer use the name Elender.

E-Pub: a successful Internet games company.

Synergon: The was first IT company to list on the Budapest stock exchange. It started as Optotrans in 1990 providing fibre-optic systems to transmit data and then moved into systems integration. Its success is partly based on the fact that in 1996 it received venture fund support from US-based Advent international.

Graphisoft: Had already established itself in the 1980s as a world-leader in architectural software, mainly for Apple computers, and by the end of the 1990s was the fifth largest in the world. It focuses on the highly priced and specialised end of the market, avoiding direct competition with Autodesk. It has managed to maintain independence, although 15% of the company was sold to Japanese investors in 1996.

Recognita: The company began as a semi-commercial venture within one of the state computer research institutes and became a fully autonomous company with the name Recognita in 1989. It established a world-wide reputation in character recognition software, focusing particularly on character sets other than that of basic English. The company was sold to the Caere Corporation of California, a competitor, when American companies began to take a greater interest in non-English speaking markets. In early 2000 Caere was bought by SoftScan, another major American player in the scanning and character recognition markets.

Sunbooks Kft is an internet book shop, *PremierPark* offers a virtual space for game playing, and *KarrierExpressz* is an Internet small ads newspaper.

ISPs

Name	Share of subscribers (%)	Telephone (36-1)	E-mail adddress
MatávNet	45	432-0700	
Elender-PSINet	23	465-7800	
GTS-Datanet	17	452-4444	Info@datanet.hu
EuroWeb*	2	224-4000	
Other (at least 25)	13	-	-

*Has many, wealthy business subscribers

Credit Cards

Hungary had 4 million card holders, 358 per 1000 inhabitants, comared with only 750,000 in 1995. Of these, 60% are Europay, 35% Visa and the remaing 5% Diners Club, American Express and own brand bank cards.

Poland

Software Companies in Poland

Rank	Enterprise	Year founded	Products revenue 1999	Services revenue 1999	Total revenue 1999	Change 98/99	Employment
1	Hewlett-Packard Polska Warszawa	1991			1,175,570	42%	269
2	IBM Polska Warszawa	1991		582,120	792,000	60%	387
3	Optimus SA Nowy Sacz	1988	572,812	578,004	650,200	7%	762
4	Prokom Software Gdynia	1991	105,199	244,145	631,192	99%	1,489
5	Siemens Warszawa	1991			611,000	39%	450
6	Computer 2000 Polska	1988	385,300	585,500	585,500	52%	123
7	ABC Data Warszawa	1990	337,000	509,000	509,000	51%	120
8	Techmex Bielsko-Biala	1987	230,235	508,163	508,163	121%	151
9	Compaq Computer Warszawa	1993		394,178	498,960	37%	148
10	ComputerLand SA Warszawa	1991		52,541	437,845	51%	877

The ComputerLand (Polska) Group: is a leading information systems integrator in Poland. Computerland offers software, consulting services, integration of local and wide area networks (LAN, WAN) and the delivery and installation of hardware made by the best manufacturers in the world. Computerland also provides software, network and hardware maintenance services (24 hours a day, 7 days a week), as well as training services. Their activity is directed at the three main sectors of the economy: banking and financial, industrial and public.

The company was established in 1991 and, after its listing on the Warsaw stock exchange, was, for a time, the darling of the exchange. As part of its move towards a greater concentration on software it bought Elba, a banking software provider, and CSBI an industrial software provider, also with banking expertise in 1996-97. It subsequently signed all four major Polish banks as clients. It also has a contract with the Warsaw Stock Exchange and is forging partnerships with America's Oracle and Sanchez Computer Associates, a banking software company.

Prokom Software: is a smaller company and relies on a very profitable $219 million contract to provide ZUS, the social insurance office, with systems integration software.

Softbank: a financial software company, also reliant on a single contract, in this case with PKO, the state savings bank, which provides it with half of its revenues.

Techmex S.A.: has its head office in Bielsko-Biala and is one of the biggest Polish computer companies, providing both hardware and software. It has commercial dealings with more than 3000Polish IT-enterprises. It was voted Company of the Year in 1997 by Teleinfo 500. magazine.

Optimus SA.: was established in 1988 in Nowy Sacz and now has offices in Bydgoszcz, Gdansk, Myslowice, Warszawa, Wroclaw, employing 762 in 1999. It is both a hardware produces and network builder and integrator.

Romania

Internet service providers (all in Bucharest)

DYNAMIC NETWORK TECHNOLOGIES	Iolanda Staniloiu	President	+40 (1) 312 2745
FX INTERNET	Andrei Vasile Neagu	General Manager	+40 (1) 322 8950
KAPPA	Ovidiu Crisan	General Manager	+40 (1) 336 5761
KPNQWEST ROMANIA	Liviu Ionescu	Managing Director	+40 (1) 410 0100
MEDIATOR	Gheorghe Rusu	Director	+40 (1) 323 8255
PC-NET DATA NETWORK	Mihai Batraneanu	General Manager	+40 (1) 330 3523
UNICOM SYSTEMS	Cornel Ciocianu	General Manager	+40 (1) 223 4359

Slovakia

Mobile phone coverage
EUROTEL (coverage by GSM signal is 98% of population and coverage by NMT signal is 96% of population), see:
http://www.eurotel.sk/cgi-bin/go?sluzby/nmt/pokrytie/index.html
GLOBTEL (coverage by GSM signal was 94% of population and 80% of area as of 20 April 1999), see:
http://www.globtel.sk/htdocs/default.asp

Computer-related businesses
GRATEX International (internet provider, WEB publishing, CD-ROM publishing, production of software, Microsoft products software) - www.gratex.sk.
NEXTRA internet provider - www.nextra.sk.
inZine internet magazine - www.inzine.sk.
Globus internet daily newspaper - www.globus.sk.

ISPs
The 21 Slovak ISPs can be located at: http://www.six.sk/zoznam.html

Annex D   Case Study

The Baltic Countries of Central Europe (Latvia, Lithuania and Estonia)

Contents

1. Economic and technical development

2. Market development since the Soviet era

3. Regulatory Development

4. Computers, the Internet and E-commerce

5. Summary

Acknowledgements

1. Economic and technical development.
(Sources: The Economist, Public Network Europe, Questionnaire Responses, Phare Multi-Country Programme)

The three countries of Estonia, Latvia and Lithuania have a combined population of 7.58 millions (1999), making up just 5.8% of the population of the central and south eastern European region. This population is declining at a rate of –0.38% (roughly twice this in Latvia) as the birth rate declines and as a result of emigration, mainly to western Europe and the Russian Federation.

Economic Data for Baltic Countries					
Country	Population		Population Growth	1999 GDP/head	Average GDP growth
	1998	1999	(% 98/99)	($)	% pa 94-99
Estonia	1,446,000	1,439,197	-0.47	3,750	4.5
Latvia	2,458,403	2,439,445	-0.77	2,701	2.7
Lithuania	3,704,000	3,700,800	-0.09	2,830	1.8
TOTAL	**7,608,403**	**7,579,442**	**-0.38**	**2,963**	**3.6**

The per-capita income at $2,963 is just below the central and south eastern European average of $3,148. The growth in GDP which has averaged 3.6% per annum since 1994, is approximately 1% pa above the central and south eastern European average country by country growth rate.

In telecommunications terms, the penetration (at 31.7 lines per 100 inhabitants) is significantly above the overall figure of 24.6% for the central and south eastern region as a whole. However, the growth of lines at 2.1% per annum is well below the regional figure of 11.8%.

Telecommunications Penetration and Growth						
Country	Lines		Growth	Teledensity (lines/100 pop.)		% Digital
	1998	1999	% 98-99	1998	1999	1999
Estonia	498,556	515,486	3.4	34.5	35.8	56.0
Latvia	741,358	732,000	-1.3	30.2	30.0	40.6
Lithuania	1,109,786	1,152,583	3.9	30.0	31.1	33.2
TOTAL	**2,349,700**	**2,400,069**	**2.1**	**30.9**	**31.7**	**40.4**

This relatively low growth rate is partly explained by the negative population growth (see above), but more significantly because the investment in the network in the Baltic countries has in the last 8 years been more for modernisation than for growth. The three countries all inherited worn-out equipment from the Soviet era, with teledensities of only 20-25%. Tariff rebalancing may be another factor currently limiting growth.

In mobile communications, all three countries were quick off the mark with competitive GSM services, growing to a total of nearly 1 million users by the end of 1999, with strong growth in

Estonia and Latvia. In Lithuania, growth has been slowest, because the economy in Lithuania was more seriously affected by the Russian crisis of 1998.

Mobile Penetration and Growth				
Country	Population	Mobile Users		Growth Rate
	1999	1999	% of pop.	% p.a. '99
Estonia	1,439,197	368,000	25.6	60
Latvia	2,439,445	272,310	11.2	80
Lithuania	3,700,800	334,000	9.0	10
TOTAL	**7,579,442**	**974,310**	**12.9**	**42**

The distribution of basic network services within 9 countries of central and south eastern Europe (including Estonia and Lithuania) were studied by the EC Phare Multi-Country Programme in 1998, as referred to in section 2 of this report. The analysis showed that rural areas were disadvantaged compared with urban areas. The table below shows the percentage of rural lines is only 20% of the total, although an estimated 31% of the population live in rural areas in the two countries. This gives an estimated teledensity of only 21% of the rural population compared with 38% for the urban population and 32% for the Baltic countries as a whole. The Phare report found that telephone penetration of rural households was only 23%, compared with the urban level of 67%. Payphones are also less well supplied per 1000 population in rural areas, especially in Estonia.

Country	Fixed Lines 1999		Household penetration (res lines/100 households) (from 1998 Phare report)		Payphones	
	Total	% Rural	Urban	Rural	Urban	Rural
Estonia	515,486	21	63	25	2,491	246
Lithuania	1,152,583	20	68	23	5,600	2,400

2. Market development since the Soviet era.
(Sources Public Network Europe, World Telecom Online, Financial Times, RIPE).

The main events since 1991 are as follows: -

1991   Independence from Soviet Union for Estonia, Latvia and Lithuania
       Teledensities: Latvia 24%, Lithuania 22%, Estonia 21%.
1992   Lattelecom becomes 49% owned by Tilts consortium (composed of World Bank, UK's
       Cable & Wireless and Telecom Finland). Tilts is granted a monopoly license until 2013.
       1st Master Plan for Estonia, including digitalisation and universal
       service. Licence granted to Eesti Telecom with monopoly until 2001.
       Analogue mobile services open in all three countries.
1994   Latvia begins major telecoms modernisation programme.
1995   GSM Mobile services launched in all 3 countries.
1996   Waiting times reduced to 3.2 years in Estonia and Lithuania.
1998   Latvia achieves WTO accession.
       Lithuania announces full liberalisation by 2003
       Cable and Wireless pulls out of Lattelecom, leaving Sonera (formerly
       Telecom Finland) with 90% and IFC (World Bank) with 10%.
       60% of Lithuanian Telecom privatised, with sale to Amber Teleholdings (50% Telia of
       Sweden and 50% Sonera of Finland)
       Latvia begins to renegotiate Lattelecom's monopoly license to bring forward full
       liberalisation by 10 years to 2003 in order to meet EU accession requirements
1999   Estonia achieves WTO accession, and announces an end to monopoly in 2001.
       Highly successful IPO of Eesti Telecom (18 times oversubscribed) 49% now held by Baltel
       consortium (50% Sonera of Finland and 50% Telia of Sweden).
       A further 35% tranche of Lithuanian Telecom is prepared for launch, 5% of shares being
       allocated to staff.
       Regulator begins functioning in Lithuania (Communications Regulatory Authority), and
       Estonia (National Communications Board) but these are still part of the old ministries and
       do not yet have enough teeth.
       Teledensities reach 36% in Estonia, 31% in Lithuania, 30% in Latvia.
       Surveys shows Internet users number 21% of the population in Estonia, but only 3.3% in
       Latvia and 2.1% in Lithuania
2000   Further privatisation of Lithuanian Telecom, but lack of interest reduces the sell off from a
       35% stake to 25%.
2001   End of Estonia telecom's monopoly 1st January.
       Latvia creates independent regulator (Telecoms Regulatory Commission).
2003   End of Lattelecom's and Lithuania Telecom's monopolies on 1st
       January.

Estonia – Free-market thinking makes it the star of the Baltics

Estonia, one of the most liberal countries of the former Soviet bloc, has put its free market thinking
to good use in the telecommunications sector, welcoming participation from neighbouring Sweden
and Finland. Mobile services, first launched in 1992, have reached 25% of the population, the
second highest in central and south eastern Europe (after Slovenia at 31%).

Estonia will be the one of the first countries in central and south eastern Europe to end its
monopoly on all telecoms services (on 1st January 2001 alongside Croatia, Czech Republic and
Slovenia). On that date, competition will extend to fixed-line telephony, including cable TV
companies and Internet telephony

Estonia has adopted the Internet with great enthusiasm. According to RIPE, the European Centre for the Internet, Estonia has more WWW sites per capita than any other country in central and south east Europe except Slovenia, and Estonia leads a number of western European countries.

Latvia – Troubled progress

Telecommunications has always been one of the most active sectors of the Latvian economy. Between the two world wars, Latvia developed a radio and telecommunications equipment manufacturing industry. Under the Soviet Union, the Latvian company VEF-KT was the leading producer of telephone exchanges with production sites in Russia, Ukraine, Belarus, Hungary and Bulgaria. Although most of the telecoms equipment is now imported (Alcatel, Ericsson, Motorola, Nokia and Nortel), the Latvian tradition in hardware and software design and manufacture has continued. Latvia now prides itself as the leading country of the region in such activities as software development outsourcing, web design and web hosting, development and hosting of E-commerce solutions, and hardware servicing.

The Latvian government rushed into the privatisation of Lattelecom in 1992. The Anglo-Scandinavian Tilts consortium that took 49% of the company were promised a complete fixed-line monopoly until 2013, but this has now been brought forward to 2003 to meet Latvia's ambition to join the EU. As a result, the investment in modernisation of the network by Lattelecom has proceeded more slowly than planned. Cable & Wireless, initial partners in Lattelecom pulled out completely in 1998.

Mobile communications penetration is less than Estonia, but is growing faster (72% in 1999).

Lithuania – The poor relations, but high growth now expected

Lithuania is the largest of the three countries with a population of 3.7 million. Although it has kept pace with fixed-line penetration, mobile users are below the other two countries and growth has been slack. The mobile market is competitive, with six licenses so far awarded, three networks being operational since the mid-1990s. With the three new licensees becoming operational in late 1999, the sector should now grow quickly, boosted by a fierce price war.

Encouraged by the very successful IPO of neighbouring Estonia's incumbent telco Eesti Telecom in 1999, the Lithuanian government announced "the largest public offering in the Baltic Region". It decided to sell a further 35% tranche of Lithuanian Telecom in June 2000, expecting to raise $300 million before the country's general elections. Due to lower than expected interest, the government was forced to lower the size and the price of the offer and raised only $160 million for 25% of the stock.

A new telecommunications Law has now brought the country close to EU regulatory standards, although the new independent regulator has yet to acquire the muscle needed to ensure full competitive market development. With proper regulation, the telecoms industry in Lithuania has the potential for sustained growth in every sector from now on.

3. Regulatory Development.
(Sources: Questionnaires, World Telecom Online)

All three countries are motivated by the desire to join the European Union and are therefore content to align their telecommunications policies to those of the EU and the WTO. Latvia and Estonia are already members of WTO and all three countries have announced the end of their remaining monopolies by 2003 (2001 in the case of Estonia).

The structure of the regulator and their relative independence and effectiveness as national regulatory authorities is shown below: -

Country	Responsible Authority	Progress Towards National Regulatory Authority (NRA)	Comment on Independence of Regulator
Estonia	National Communications Board (NCB)	The NCB is part of the Ministry of Roads and Communications	Committed to early operation of liberalised market
Latvia	Ministry of Transport and the Telecommunications Tariff Council	Department of Communications (Regulator) is part of Ministry	Under new proposals, the independent Telecoms Regulatory Commission will be created in 2001
Lithuania	Ministry of Transport	NRA under preparation as a result of the 1998 Law (Communications Regulation Agency)	Implementation of liberalised regulation is politically sensitive, therefore CRA has only nominal existence. Progress slow.

The main regulatory frameworks are detailed under the various EU liberalisation policy headings as shown below: -

Regulatory Policy	Estonia	Latvia	Lithuania
Full Competition?	1 Jan 2001	1 Jan 2003	1 Jan 2003
Universal Service Obligation?	From 2001	Not until 2003	Since 1998
Price Control on basic basket?	Yes	Yes	Since 1998
Transparent pricing?		Yes	Since 1998
Recognition of equipment approvals?	Yes	Yes	Since 1997
Competition on Mobile?	Since 1995	Since 1996	Since 1995
Customer data protection?		Yes	Since 1995
Free emergency numbers?		Yes	Yes
Directory Enquiries?		Yes	Yes
Complaints/arbitration?	Yes	Yes	Yes
Full interconnect rights?	Yes	Yes	Since 1998
Independence of Regulator		1 Jan 2003	1 Oct 2000

4. Computers, the Internet and E-commerce
(Sources: Questionnaires, World Telecom Online, RIPE)

Latvia

It is estimated that 1.3 % of inhabitants have a computers in the home (4.1% of households have computers in 1999). 7.8% of the population have computers at work. These penetrations are growing at around 20%-30% per annum. Around 40% of employees in commercial enterprises have access to and use the Internet.

The post of national "Advisor in Informatics" was established by the Prime Minister in July 1999.

The Latvian government has a "National Informatics Programme", approved by the Cabinet of Ministers in March 1999. This is an ambitious programme targeting the period 1999-2005, with 13 sub-programmes.

The National Informatics Programme in Latvia

"The **fundamental goal** of the National programme "Informatics" is to integrate Latvia into the global development process and to form the Information Society in Latvia.

Political objectives are directed towards a further democratisation of Latvia and its integration into the European Union, enhancing state administration.
Social objectives are directed towards maintaining of Latvia identity for all strata of society, and development of the state and society in a multicultural and multilingual Europe.
The National programme´s execution basis is a set target to achieve a **universal service concept** in the country, by ensuring for each member of society a qualitative access to all types of information in compliance with the rights set in the normative acts."

All Latvian ministries have set up Boards of Informatics during 1997-1998 which will co-ordinate implementation of the Informatics Programme under the overall control of the Co-ordination Board for the National Programme "Informatics" which was established in 1997

The government is thus one of the leading investors in ICTs, committing Ls 13.418 million in 1999 and Ls 10.259 million in 2000 to the Informatics programme. In addition, it is spending Ls 4.5 million (1999) and Ls 2.1 million (2000) in the establishment of the State Revenue Service's information system. (Note Ls 1= $US 1.7). In addition there is the Latvian Education Information Project, but although it was scheduled to receive Ls 7.5 million, it only received Ls 4.5 million.

The Action Plan for implementation of the Integrated Information System of registers of State Significance (Megasystem) was accepted by the Cabinet in September 1999. The first stage of the system has been created in 1998-1999.

The Baltic Government Data Network Project is considered as expanding of the Megasystem on international scale and as a pilot stage for integration of national information systems in Trans-European systems like IDA.

The Unified Information System of Local Authorities started from January 2000. The first phase of the project will allow a nation-wide replacement of the existing population registration system based on passports with ID cards.

A Concept for improvement of public services provided by State and Municipal institutions ("Information and Service Centres") was approved by the Cabinet on 14 December 1999.

The state monopoly, Lattelekom, has invested more than Ls 280 million in upgrading the technologically outdated telecommunications network. The company has also invested more than Ls 5 million in high-speed data transmission networks for corporate clients

Together, these major ICT public projects amount to approximately 3-5% % of yearly GDP.

In keeping with its traditions in the hardware and software industry, Latvia is making good use of its expertise to exploit Internet and computer based applications commercially.

The Emerging E-commerce and Software Development sector in Latvia

"In Latvia over twenty on-line shops have been opened by Latvian business companies and are selling mainly consumer goods. A noteworthy E-commerce solution has been developed by Tilde selling their product – Fonts world-wide. The truly interesting issue is that fonts are not a global product in itself, it is highly localized and it is able to get into foreign markets with the co-operation of an internationally recognized software company. Another interesting E-commerce solution is offered by Lursoft which provides access to a number of on-line databases including the Business Register and various newspapers.
Internet banking services were opened in the largest Latvian Commercial banks during the end of 1999 and beginning of 2000. The outsourcing of software development has become the core competence of several Latvian software companies and Latvian software developers have gained significant experience from several large – scale software development projects.
Still the greatest possibilities are for applications in the Latvian language and state request for software elaboration for state significance information systems.
Latvian companies are providing turn-key solutions to clients. Turn-key services are being exported to over ten different countries.
DATI Group is the largest software developer in Eastern Europe. It specialises in large scale and complicated software project design and development. Transfer of management skills and educational programmes have lead to even faster growth of the company.
Tilde is the leading company in Latvia developing language tools such as spell check, dictionaries, fonts and encyclopaedias. It also specialises in localisation of various application software, e.g. bookkeeping packages, for the use in Latvia.
The Tieto Konts Financial Systems company is a leading developer and provider of credit/debit card processing systems. During the first stages the card processing software was used for local payment / gasoline cards throughout Latvia. In 1993 the payment card systems were certified by the international payment card organizations – VISA and Europay

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Some of the major remaining obstacles for the development of E-commerce in Latvia are the need for large long-term investments and the absence of supporting industries. The driving forces that are facilitating the growth of E-commerce are deregulation, which will drive down telecommunication costs, plus a targeted legal base, which may speed up the growth of the E-commerce.

Notable progress towards the development of E-commerce legislation includes: -

▪ There already exists particular legislation on e-documents – the Landbook Law by amendments on November 1999 is now providing the only electronic registration of Landbooks. The implementation of the computerized Landbook register is regarded as one of the key prior actions to be taken for the development of the private sector, the legal protection of property rights and the development of a market oriented financial sector in the country.

▪ The Working Group for the elaboration of the concept and Law on Digital Signatures and Electronic Documents was created by the Decision of the Cabinet in December 1999 at the

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Ministry of Justice. The draft Law on e-signatures must be ready by the end of 2000. The Latvian Business register has been chosen to start the pilot project on implementation of e-documents and digital signatures in State institutions during the second half of 2000.

Summary of Government Policies which deal with the use of ICTs in public services in Latvia

- Co-ordination Board for the National Programme "Informatics" formed in November 1997.
- Formation of Boards of Informatics in all ministries during 1997 – 1998.
- National Programme "Informatics" approved by the Government of Latvia in March 1999.
- Information society projects included in the Declaration (Programme Document) of the cabinet of Ministers in July 1999.
- The post of the Advisor in Informatics established at the Bureau of the Prime Minister in July 1999.
- The concept for the operation and development of the State Information Network Agency (VITA) accepted by the Cabinet in August 1999.
- The Action Plan for implementation of the Integrated Information System of registers of State significance (Megasystem) accepted by the Cabinet in September 1999.
- Free Access to Information Act accepted by Latvian Parliament on 29 October 1998.
- Provisions of the Cabinet on the order of provision of information according to Free Access to Information Act issued on 3 August 1999.
- A Concept for improvement of public services provided by State and Municipal institutions (Information and service centers) approved by the Cabinet on 14 December 1999.
- The State investment project of the Unified Information System of Local Authorities started from January 2000. The first phase of the project will allow a national wide replacement of the existing population registration system based on passports with ID cards.
- The project of creating of access points to the Internet in less developed regions of the Latvia started in late 1999 by the support of the Soros Foundation Latvia.

Lithuania

It is estimated that 4.1% of Lithuanian households have computers in 1999, with half of these having Internet access. 13% of employees have computers at work; this percentage is higher in commercial enterprises (20%) and government offices (80%). Around 65-70% of employees in commercial enterprises and government have access to and use the Internet. It is estimated that around 1.9% of GDP is spent on ICTs (equivalent to approximately $50 million dollars per annum).

Internet technologies are now being used for financial transactions between banks and some companies are beginning to offer Internet shopping. The Electronic Signature Law was prepared recently, and this will help to expand the Internet shopping market.

The government has introduced special courses to educate the unemployed in the use of computer technologies. Also, government employees generally attend two weeks of training per annum, 30% of which is devoted to ICTs.

There are no laws regulating Internet access or content at present, though some measures are taken to prevent the dissemination of harmful information (e.g. pornography). The Law on Amenability for Illegal or Criminal Usage of Data stored on Information Systems is being prepared.

Summary of Legislative framework for E-commerce

- *The Law of Legal Protection of Personal Data is approved,*
- *The Law of Legal Protection of Copyrights and Neighbouring Rights is approved,*
- *The Electronic Signature Law is drafted and presented for approval by Parliament.*
- *Law on Mass Media (Public Information)*

The government has set out its policy on ICTs in the document "State Communications and Informatics Development Programme", approved in 1996. (http://www.iid.lt/eng/activities.htm).

The government has also prepared a draft "Government Programme on the Information Society", but to make this happen a governmental institution needs to be established to be fully responsible for Information Society matters, with appropriate financing for ICTs. Every governmental institution which is responsible for delivery public services is connected to State Institutions Data Network (VIKTA).

It is realised that the government could make more investments for improving the accessibility of public to information technologies. To this end, the incumbent telecommunications operator "Lietuvos Telekomas", in co- operation with the Ministry of Education and Science, started in 1999 a special project for providing secondary schools with Internet connections.

Two university centers for distance education have been established. There is also a "School Computerisation Program", approved by the Ministry Of Education and Science.

5. Summary

The Baltic countries of Latvia, Lithuania and Estonia, whilst behind the EU countries in the penetration and use of ICTs, are generally ahead of the other central and south eastern European countries, particularly the Balkan countries. It has been found that the technical skills of the ICT specialists are in line with the requirements of foreign companies when considering recruitment of local staff.

E-commerce, teleworking and distance learning are already established and growing strongly. The main barriers to a more widespread application of ICTs in the region are the penetration and affordability of basic telecommunications services, particularly in rural areas.

The following answer to the Questionnaire completed by a government official in Latvia summarises the situation well: -

Question. "In your opinion, what single act (for example change of government policy, external funding action) could improve the access of the population to ICTs for all social groups, or for particular economic or social needs?"

Answer   "An essential increase of the whole society´s level of life.
The National Programme "Informatics" implementation.
New Law on Telecommunications –
- liberalization of the telecommunications market;
- further privatization of National operator;
- special Universal Service Fund organization;
- independent regulatory regime;
- further public telecommunications network modernization, in particular pay attention to the rural regions"

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Annex E   Supplementary information on international donors

The World Bank

(Information obtained from the World Bank's website)

The World Bank Group has been strongly committed to the development of the ICT sector from its early investments in telecommunications infrastructure. It has been a key player by providing assistance to the emergence and consolidation of the drive for liberalized markets and for the privatization of state-owned telecommunication enterprises. Through IFC's participation in private investment projects and the new emphasis given to the Internet and its related business, the World Bank has effectively promoted the participation of private investment into the development of the ICT sector, in particular into Internet oriented businesses.

Budget

The Bank's portfolio in telecommunications in the Europe and Central Asia region (ECA) amounts to an estimated US$500 million, evenly divided between International Bank for Reconstruction and Development (IBRD)/ International Development Association (IDA) and International Finance Corporation (IFC). *Info*Dev, the Bank-managed grant facility to finance innovative projects to promote information in development, is supporting several small initiatives.

Objectives

Its operations have focused on infrastructure modernisation and expansion and on providing technical assistance for policy reforms and regulatory capacity building. Bank support for information infrastructure through the financing of information and communication technologies (ICT) is difficult to estimate, as these are not separately reported. However, it is estimated that there are 100 projects with significant ICT components totaling US$1 billion in the ECA region.

The Bank's *objectives in telecommunications* in the ECA region are to:

- Build capacity among government agencies and public institutions to conceive and implement policies for the development of widespread information-based economic activity and the infrastructure (physical, rules-based, and human) required to support it;
- Assist the transition to market-based economies, integration into the global economy, and--in the case of the EU accession countries--membership in the European Union;
- Promote access to communications and information for those presently denied or unable to afford to continue service; and
- Mobilize resources and expertise, primarily from the private sector.

The Bank's strategy to meet these objectives has four main elements:

1. ***Policy and Regulation.*** Lending and advisory support in policy making for information system issues generally, and the telecommunications sector in particular, and the development of regulatory capacity.

2. ***Access to Communications.*** Emphasis on advice and lending operations to broaden access to information and communications services by regions, communities and individuals not adequately served at present, as well as those who may not be able to afford to maintain current access.

3. ***Resource Mobilization.*** Primary focus of the Bank is creation of an environment to attract private investment. Particular attention will be paid to improving the impact of privatizations. Bank investment financing will come, in the first instance, from IFC and MIGA (Multilateral Investment Guarantee Agency). Any IBRD/IDA investment financing would come as part of appropriately dimensioned public-private partnerships in higher-risk countries, regions, and market segments.

4. ***Strategic Information Systems.*** Implementation through lending operations of key national strategic information systems, as well as information systems needed to support the Bank's sector operations and initiatives.

Project suggestions to the World Bank are grouped as follows:

- a **Quick-Start Package** of projects for which implementation is likely to start or a tender will be awarded during the next twelve months (up to 31 March 2001);

- a **Near-Term Package** of projects which appear prima facie economically justified, and do not present major sector or project issues, thus for which preparation (including tendering) should be accelerated; and

- a **Medium-Term Package** of projects that require further investigation or analysis on specific issues which must first be solved.

Regional Near-Term Telecoms projects include: Institution Building and Regional and National Training projects (Total cost: 12 million euro). See chart below for a breakdown of near-term projects by country (no breakdown available for near-term telecoms projects).

Regional Medium-Term Telecoms projects include: Contribution to a universal service fund and an Information Society Programme. (Total cost: 150 million euro)

No ICT projects are included within the Quick-Start Package.

Near-term basic infrastructure projects by country

Country	Amount (m euro)	% of total
Romania	770	28
FYR Macedonia	303	11
Montenegro	64	2
Kosovo	42	2
Croatia	237	9
Bulgaria	667	24
Bosnia	320	12
Albania	320	12
Regional	12	-
Total	2735	100

The SOROS Foundation

(Information obtained from the Soros Foundation's website)

With the overall aim to promote the development of an Open Society, the SOROS Foundation's Open Society Institute initiates Network Programs which focus on Central and Eastern Europe.

Within the Network Program is the Internet Program (OSI-IP)

The Internet Program sponsors multi-country initiatives in the Central and Eastern European region. Projects focus on connectivity, training, content development as well as equipment grants. As of 1998, content development and training are the primary focuses of these OSI-IP initiatives.

The OSI Internet Program (OSI-IP) began in 1994. Prior to that grants related to e-mail connectivity were provided on an ad hoc basis by the local foundations. The first year of the OSI program was primarily spent funding local initiatives, developing strategy and making contacts with funders and networking specialists throughout the world with special emphasis on Central Europe. In 1995, the program extended its geographic reach to the non-Slavic republics of the former Soviet Union focusing on infrastructure and connectivity which were badly needed in the region. In 1996, it encompassed all the former republics and absorbed the larger scale infrastructure projects that had been managed by the International Science Foundation. From 1997 to 1999 with a well developed strategy and an abundance of contacts in place, the program had a diverse array of funding and program partnerships with third party institutions. It began operating in earnest outside the primary geography of Central and Eastern Europe and focused upon content development and training over infrastructural development and connectivity. The exception continues to be the Caucasus and Central Asia where Internet began later and infrastructural assistance is still required. The program also began focusing on Internet policy work in 1997.

In 2000 the program was completely overhauled to reflect the evolution of the Internet and changes on the ground. The program now concentrates on organizational capacity building and Internet policy work and has a primary focus in the areas of independent media, human rights and internet policy.

"Internet Policy in the Baltics: Access, Free Expression, and Due Process" was OSI-IP's first major policy initiative for the Internet. It was a twelve-month project centered on Internet-related policy developments in the countries of Estonia, Latvia, and Lithuania. In particular, the project set forth to explore whether legislation and/or other policy developments addressing various aspects of the Internet are evolving in accordance with principles of an open, democratic information society.

The project built on a 1996 conference convened in Brussels by the Parliamentary Human Rights Foundation (PHRF), which brought together a group of Internet experts from around the world, along with officials from the Baltic states, to draft a set of Open Internet Policy Principles ("OSI Principles").

The Electronic Frontier Foundation (EFF) picked up where PHRF left off with the project to evaluate how each of the Baltic country's Internet structures conform to the OSI Principles. This was accomplished in two phases, which are briefly described below: 1) an expert team assessment; and 2) a regional conference.

EFF met with representatives from each country's governments, nongovernmental organizations, computer/networking companies, and academic institutions. In addition, EFF worked closely with each of the Baltics' Open Society Institute offices to plan the two phases of the project.

Project Findings

What the team found and presented at the final conference in Estonia was that the importance of the Internet to building citizenship in these emerging democracies is widely viewed as an important objective for the future of the region. However, most of the Internet-related activities of the Baltic countries to date have been focused on problems associated with infrastructure and access. Public policy initiatives related to content on the Internet or possible restrictions on the underlying technology have not yet surfaced. Likewise, there are no limits placed on the use of strong encryption in any of the countries. The process, expertise, and organizations needed to fully consider such policies in the future are either just beginning to emerge or not yet in place.

Specifically, the expert team recommended that:

- Each country develop nongovernmental organizations that can represent the interests of Internet users in future policy development.

- Each country form independent Internet Service Provider associations to represent the interests of this rapidly growing industry in the region.

- Each country set up independent telecommunications authorities that are tasked with monitoring the telecommunication market to ensure fair business practices.

- A regional "Information Society Policy Working Group" be established with representation from the governments, Internet industry, nongovernmental organizations, and academic institutions of each country.

- While the Estonian Parliament had already adopted a set of information policy principles to set forth its societal values as a basis for supporting an information society, Latvia and Lithuania should go through similar processes, using the OSI Principles as their baseline.

Population Targeted: The Baltic states, Internet policy advocates, Internet users.

Co-funding: The European Union provided the venue to carry out the initial conference activities.

Plans for 2000: The Internet Media Program

The Internet Program was revised significantly for 2000 and its name changed from Internet Program (OSI-IP) to Internet Media Program (OSI-IMP). This reflects the changes in the region it primarily supported, changes in Internet itself and changes throughout the foundation network's programs. The addition of "media" in the name is related to the following definition of the term, media:

1) An intervening substance or agency through which something else is transmitted, carried on, accomplished, conveyed or transferred

2) A means of mass communication. The change reflects the new program's focus on using the Internet to better meet institutional objectives and accomplish specific goals, as well its new policy initiative and independent media focus.

In the CEE/NIS region, the original intention of the Internet program was to provide "survival connectivity" in countries where Internet didn't exist or was inaccessible to most of the population, by the year 2000 basic connectivity was much less of an issue. Exceptions were in the Caucasus and Central Asian regions where this was still an issue. The OSI-Internet program had been

concentrating on sponsoring training and content development initiatives more that connectivity and infrastructure initiatives from 1997.

Program Objectives:

Goal 1 [Organizational Capacity Building]: Provide targeted organizations resources to make appropriate use of new media information technology to better deliver their message and broaden their impact on the communities they serve.

Goal 2 [Internet Policy]: Insure that Internet Policy is nurtured appropriately by providing grants to organizations delivering information and advocacy on this subject.

Goal 3 [institutional Partnering & Information Sharing]: Insure that other foundations and funding agencies see the value of these initiatives in partnering with OSI and begin including them in their own program mix.

Other initiatives under the Internet Program (present and future)

- **ITC Ukraine NGO/ISP**

In 1996, the International Science Foundation project in Kiev, including a metropolitan area network built with microwave and satellite technology (as well as a training center), was spun off into a separate NGO founded by OSI, the Ukrainian International Renaissance Foundation and the Academy of Sciences. The new organization, called ITC, is an Internet service provider.

In 1997, an agreement was entered into with the Ukrainian government to jointly work with the ITC to expand connectivity to the civil sector in Ukraine.

Population Targeted: Universities, schools, NGOs, libraries, medical institutions.

Co-funding: Ukrainian Ministry of Science.

- **OSI Womens's Network Access Project**

In 1998, OSI-IP sponsored a sweeping project coordinated by the OSI Network Women's program to provide access, training and content development services to women's NGOs throughout the region supported specifically by foundation programs. In 1999 additional funding was provided to integrate Rroma women's participation in the project.

Population Targeted: Women's NGOs.

Other Sponsors: Network women's program.

- **South Eastern European Information Network**

In 1999 after the NATO intervention in Yugoslavia, the Stability Pact initiative was formed. The initiative is a regional project which aims at strengthening the South Eastern Europe's countries efforts to foster peace, democracy, respect for human rights and economic prosperity in the region. To reach these objectives, governments and institutions in the region, both local and international, need to coordinate their activities which would provide faster and more compatible regional progress to the Euro-Atlantic association. In this light, FORUM, a regional NGO ThinkTank, proposed the creation of SEEIN, a website that collects information, projects, etc. from various sources related to the stability pact, and shares it in real time with associated interactive components between the various institutions. It's expected the site will enable greater coordination

and communication of regional activities across countries and the various agencies working in them.

Population Targeted: Institutions and individuals interested in the region and Stability Pact Initiatives.

- **Rroma Project**

At the end of 1996, OSI-IP supported a [Rroma Internet Program](#) in Hungary. The main element of this program are schools where Rroma children are studying. The plan is to set up a network of 32 Rroma schools (16 in the first phase). These schools will also be the basis for Rroma civil organizations and their use of the Internet during non-school hours. OSI-IP, together with the Rroma Education Program of the [Soros Foundation - Hungary](#), will supply the facilities with hardware/software, connectivity and training. In 1999 provided support for the [Rroma Virtual Cultural Center](#) to continue its work.

Population Targeted: Students, NGOs, individuals.

Training Sponsorship: OSI-IP will fund training of network administrators.

- **CEENet (Central and Eastern European Networking Association) Networking Workshop**

In 1997, after funding a number of successful Internet training workshops hosted by [CEENet](#), OSI-IP contributed to a workshop dedicated to exploring issues in the region of network governance, PTT relations, universal access and managing commercial, semi-commercial, and non-profit networks. Internet policy issues were also discussed. At the end of the conference, a statement of principles for networkers in the region (particularly the Academic and Research Networks which the CEENet membership represents) was delineated.

Population Targeted: Network managers in the Central and Eastern European region.

Co-funding: [NATO Science and Technology Program](#).

- **CEENet Training Workshop**

In 1995, OSI-IP supported [CEENet](#)'s first initiative to host training of the second generation of 84 "networkers" from Central and Eastern Europe at a regional workshop in Poland. At this meeting, the first generation, trained at previous [ISOC](#) workshops was able to share experiences and information with the second generation of networkers. For the first time participants from Kyrgyzstan, Kazakstan, Albania and Macedonia participated. OSI-IP also supported the participation of several CEENet coordinators in the ISOC meeting in Montreal to learn about logistics and program development.

In 1996, OSI-IP hosted the CEENet meeting at the [Central European University](#) in Budapest. Members of ISOC were there to evaluate the results and their input suggested that CEENet had created a training venue that met ISOC standards. Indeed a number of the trainers from ISOC gave classes. In 1997, the CEENet workshop was held in Zagreb, Croatia with over 90 participants.

One of the subjects at the 1996 CEENet workshops was "Connectivity and Society," examining the responsibility that the academic and research community has to provide connectivity outside the academic and research networks. This theme has been incorporated as a 'standard' of future CEENet training workshop activities.

In 1999, the workshop concentrated on 'training the trainers' to allow other countries to hold their own workshops. A CEENet training workshop in Yaroslavl, Russia was also provided. A distance

education initiative has also been funded to turn the workshop courses into a distance education initiative. This will allow more people to take the courses at a lower cost. The first phase was providing trainers a course on distance education using distance education itself. This will be expanded to actually provide coursework to students in 2000. From 1999 as well, the workshop is hosted at the CEU conference facilities as the environment was deemed best for this activity.

Population Targeted: Universities, academic and research community.

Co-funding: NATO co-funded the workshop in 1995, 1996, 1998 and 2000. Also in those years, the Internet Society provided logistical support and training.

- **Internet Society Training Workshop for Developing Countries (ISOC)**

In 1993 the SOROS Foundation began sponsoring the Internet Society's very successful Internet Training For Developing Countries Workshop) held once a year just prior to the Internet Society Conference. It is a forum for people to learn about the various concepts of networking taught by experts as well as doing 'human networking' to help themselves and their countries make the most use of the Internet.

Even before a formal Internet program existed, in 1993 the foundation sponsored 60 professionals from Central and Eastern Europe to take part in the Internet Society's Developing Countries workshop. These represented the first generation of "networkers" running academic and research networks, BBSs and Internet services for their countries. Technical people from the different countries of the Soros network were also sent as a means of making connections with their peers, meeting each other for the first time and learning more about the Internet.

In 1994, OSI-IP again funded the Internet Society's workshop, mainly because it was hosted in Prague

In 1995 and 1996, OSI-IP continued to fund participants to the ISOC conference, but focused on providing subsidies to those people from countries of interest to the network of foundations not covered under the CEENet training umbrella, namely Central Asia and the Caucasus.

Population Targeted: Universities, academic and research community, NGOs.

Co-funding: Many institutions and companies fund this workshop. Including, for the first few years, the NATO Science and Technology Project which OSI-IP worked closely with.

USAID

USAID is an independent US federal government agency which works within the foreign policy guidance provided by the US State Department. The agency works in areas which it regards as important for achieving sustainable development and advancing US foreign policy objectives.

Since 1992 USAID has assisted the formerly communist nations of Europe and Eurasia in their transition to market-led democracies and now has a number of programmes assisting these countries, ranging from maintaining regional stability to promoting commercial opportunities under the Support for Eastern European Democracy programme, which has the aspirational acronym "SEED".

With regard to Information and Technology initiatives, its only major involvement was the Presidential Initiative on Internet for Economic Development, a Clinton-Gore initiative set up in 1995 and covering 13 countries, including Bulgaria and Romania.

USAID is beginning to look at ICTs and the use of the internet in developing countries and is currently carrying out country assessments, with the initial emphasis on legal and regulatory issues.

Meanwhile the Technical Training for Societies in Transition, or TRANSIT, project uses ICTs as a means rather than an end. Its objective is to provide training for improving local governance and delivering services through ICTs. TRANSIT is funded by USAID's Bureau of Europe and Eurasia to support the economic reconstruction of Central and Eastern Europe and the New Independent States through participant training. World Learning Inc is responsible for project activities in the CEE region. Training activities are conducted in the US, in-country or in a third country, depending on what is most cost-effective. International Science and Technology Institute, Inc (ISTI) is responsible for monitoring and evaluating the training.