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CREATING AN ENVIRONMENT FOR FREE ENTERPRISE: SOME NEW APPROACHES FOR CENTRAL EUROPE

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Summary

This paper defines a set of approaches, based on the latest thinking in Western economics, which Central European economies in transition can use to help meet the challenges they face. Although each of the previously socialist economies has its own unique set of problems, successful transition in each country will require: focus on the development of what are called "economic clusters;" more concentration on economic strategies at the regional (as well as to the national) level; and building stronger "economic infrastructure."

Cluster economies exist in places where industries purchase a significant percentage of their inputs from nearby suppliers, hire workers from the same pools, and work repeatedly with the same banks and R&D institutions. Many countries' experiences have shown how regions can develop "islands of excellence" for enterprise by building up economic clusters.

The question of economic infrastructure is especially important in Central Europe. In many regions, public and private investment in economic infrastructure can provide the best way to strengthen emerging and existing clusters. Overall, building a well-developed infrastructure base will be a key element in determining the success of these economies in making the transition to market-oriented systems. Consequently, the paper focuses particular attention on the development of the six elements of economic infrastructure in Central Europe. These include:

- Accessible Technology: Every modern economy needs a system of technology infrastructure to facilitate innovations in enterprise and enable growth and modernization of industry. The indicators for Central Europe suggest that, whereas these countries excel in technical discovery, so far they have been less adept at following through with the much-needed development and deployment of technologies.

- Adaptable Human Resources: A market-based economy needs a work force that is well educated and will respond to the diverse array of changing skill needs of competing industries. The human factor could turn out to be one of the most difficult challenges facing the leaders of transforming economies in the decades ahead. As both manufacturing and product technologies become more sophisticated in Central Europe, the demand for a better-trained work force, management cadre, and business leadership will grow and so will the demands on universities and institutes for training them.

- Available Financing: A competitive economy has financial institutions attuned to the requirements of industry at different stages of its life cycle. The reform of banking structures and the introduction of venture capital to Central Europe has been fairly modest so far. Among the more significant difficulties ahead for Central European countries attempting to rebuild financial infrastructures are their limited technology resources and the lack of trained workers for the financial sector. Therefore, one central goal of rebuilding the financial infrastructure in Central Europe must be the provision of improved training and education programs for workers in this sector of the economy.

- Entrepreneurial Culture: A competitive economy has a culture that encourages entrepreneurship through both formal and informal means. Empirical evidence strongly suggests that those Central European countries that have provided both more freedom for entrepreneurial activity and a legal framework supporting that activity show the most promise for successful reform. Encouragement of entrepreneurial activity, accompanied by the rebuilding of the political and economic frameworks supporting reforms, is essential for successful transitions from the command to the market economy in all Central European countries.

- Advanced Physical Infrastructure: A competitive economy provides the forward-looking physical infrastructure required by different sectors of the economy. An advanced physical infrastructure not only supports industry but can serve as an economic force by generating a demand for services, equipment, and materials that further stimulates the economy. Elements of advanced economic infrastructure include telecommunications, transportation, and power and energy supply. The lack of adequate telecommunications infrastructure in Central Europe is one of the most difficult and costly the region must address. Because the entire region is in desperate need of transportation modernization, these countries also have a need to work together to develop a coordinated regional transportation system that could help both the local and regional economies mature successfully. Finally, the last several decades have witnessed energy-intensive industrial growth in Central Europe which has, as a result, developed inefficient industrial bases that consume and waste inordinate amounts of energy in the production process.

- Quality of Life: A competitive economy has a living environment that is attractive to highly skilled, mobile individuals. The elements contributing to quality of life are public services, arts and culture, and environmental protection. In evaluating the economic infrastructure of a region, economists traditionally have paid little attention to quality-of-life indicators. Yet in Central Europe, with its extraordinary economic and social upheavals, some consideration of this issue is critical to understanding the likelihood of significant long-term economic transformations in the region.

Experience in both industrialized Western states and newly industrializing economies has shown that the comparative advantage of a country or a region in the 1990s will stem from the presence of relative strength of economic clusters, the flexibility of regions to choose economic directions, consistent with their particular industry base and economic infrastructure, and most importantly the availability of soft and hard infrastructure for industry and business. For Central European economies, developing such approaches must be a leading investment priority in the years ahead.

SOME NEW APPROACHES FOR CENTRAL EUROPE

Introduction

An array of challenges faces Central Europe today as each of the countries in the region undertakes the complicated process of moving toward a market-oriented economy. This paper suggests a new approach that economies in transition should take to support the introduction of markets into their economies. While macroeconomic concerns have been at the forefront of these countries' reform efforts, making a successful transition to a market economy requires the parallel development of both macro-level reforms and microeconomic changes aimed at the development of a strong infrastructure base both locally and regionally.

The importance of reforms aimed at building economic infrastructure stems from the changed nature of comparative advantage in today's global economy. At the dawn of socialism, the economists of the day believed that competitive advantage stemmed from static factors found within each country's borders: land, natural resources, and human labor. Today, however, it is clear that comparative advantage is "dynamic"—that it can be shaped by purposeful actions of public and private institutions acting in concert to create conditions required to be competitive in a global economy.

To date, most Central European countries have introduced reforms aimed, for the most part, at transforming the *macroeconomic* structures of their economies. These have included:

- **Monetary reforms**: removing monetary overhangs and moving toward currency convertibility.
- **Fiscal reforms**: establishing revenue systems appropriate to a more decentralized economy.
- **Price reforms**: ending subsidies for critical industrial inputs, such as energy and transportation, and freeing prices generally.
- **Legal reforms**: establishing the legal foundations for market economies, including laws enabling ownership of private property and contract law.
- **Trade and investment reforms**: encouraging more open trading practices and more investment with international partners.

Experience in both industrialized Western states and newly industrializing economies has shown that the comparative advantage of a country or a region in the 1990s will stem particularly from three interrelated sets of factors:

- The presence and relative strength of economic clusters, i.e., agglomerations of related industries and institutions in a location, promoting high-value-added and consumer-oriented industries.
- The availability of both soft and hard infrastructure for industry and business. Such infrastructure should encompass access to technology, a skilled and adaptable work force, and capital availability.
- The flexibility of regions to choose economic directions, consistent with their particular industry base and economic infrastructure.

One must link these factors and macroeconomic ones to explain why, in the past decade, some countries and regions have responded well to global economic changes while others have performed poorly.

Economic Clusters

What are economic clusters? When a set of industries purchase a significant percentage of their inputs from nearby suppliers, hire workers from the same pools, and work over and over again with the same banks and R&D institutions, there is an added economic benefit in which the whole is greater than the sum of the parts.

Firms inclusters are the ones that develop new product lines, set prices, and establish worldwide distribution channels for their products and, as a consequence, can capture most of the value added. Serving only as a site for branch plants (or as a source for raw materials) is a less and less rewarding economic role for a country to play. Yet, this is the future still sought by many nations.

Consider a firm developing a new computer peripheral. If it is located in San Jose, California, the firm can easily find a source that can provide the right microchip, another firm that can provide software, and a third that can place a product on shelves at retail outlets internationally. This local concentration of talent results in a geographic center of innovation (Silicon Valley) which in turn is used by international companies, which then produce and market new computer products worldwide. Or suppose a firm wants to develop a new line of clothes. If it is in Hong Kong, it can easily find someone who can design the pattern, another person who will find the right material, a third who can get it cut and sewn in China or Brazil, and a fourth who can provide assistance regarding American and European quotas.

The importance economic clusters can have in an economy is well illustrated by the relationship between Hong Kong and southern China. In the past decade, thousands of factories have been established in Guangdong, adjacent to Hong Kong. They produce toys, garments, and sophisticated electronics. Hong Kong, which is linked to Guangdong by a light railway, has supplied the economic resources that have made Guangdong's industry productive: workers are trained by trainers from Hong Kong; Hong Kong banks provide money for equipment; and Hong Kong managers live for short stints in factory-supplied dwellings (and return home for weekends). Because the resources in Hong Kong's cluster have been made available to southern China, the 5% of China's population in the area adjacent to Hong Kong now produce over 30% of the country's exchange currency earnings, and southern China's Special Economic Zones (SEZs) have been extraordinarily successful. One, Shenzhen, has grown from 80,000 to 1.5 million people in 8 years. At the same time, SEZs in northern and central China mostly have been much less successful.

The relevant question is: What clusters of industry does Central Europe have and which incipient clusters should it develop? Serving only as a site for branch plants (or as a source for raw materials) is a less and less rewarding economic role for a country to play. Yet, this is the future that many formerly socialist nations may be relegated to. Given Central Europe's economic heritage, the countries that make it up should aim higher, especially in the long term, than simply providing low-wage assembly jobs.

The New Importance of Regional Economies

The regional problems facing Central Europe have been complicated by the fact that differences in industry structure and economic infrastructure have driven regions within countries in different directions in response to changing world demand. This same phenomenon has been occurring worldwide. In the United States for instance, events in Tokyo often have more economic influence on California than do decisions made in the nation's capital. Department of Commerce figures confirm that 1980 saw the end of 50 years of convergence in U.S. regions' per capita income. Since then, different U.S. regions have begun to go different ways: some down like the Great Lakes, some up like the Northeast. This difference in performance has been due in large part to differences in economic clusters between regions and to the presence or lack of sound economic infrastructure to serve such clusters.

Similar disparities have occurred in the United Kingdom (between London and Northern England), in Japan (between Tokyo and outlying prefectures), in China (between the south, the center, and the north), and in Canada (between Ontario and the remainder of the Confederation).

Overall, from an economic perspective, the role of the nation-state is increasingly becoming macroeconomic. What often matters most in an economy is what happens in economic regions where new enterprises and existing industries, often in clusters, gain competitive advantage through market specialization and access to critical elements of economic infrastructure. Thus, ways must be found to regionalize economic planning in these countries, as well. Indeed, many countries' experiences have shown how particular regions can become "islands of excellence" for enterprise by building up economic clusters and economic infrastructure. In such regions, public and private investments in economic infrastructure led the way in establishing the conditions for enterprise growth. This is the strategy Central Europe should pursue.

Economic Infrastructure

What affects the future of clusters and regions? There appear to be at least six key elements of hard and soft economic infrastructure that modern economies require to be productive and competitive. These are accessible technology, adaptable human resources, available financing, entrepreneurial culture, advanced physical infrastructure, and high quality of life.

Recent experience around the world shows that specific elements of a country's economic infrastructure can be purposefully strengthened or improved. For example, in the past decade, many nations have tried to bridge the gap between their science establishments, such as universities and national laboratories, and the technology needs of their economies. In the United States, many states have earmarked millions of dollars to such tasks, thereby successfully helping to finance the modernization of America's manufacturing industries. Similarly, in Japan, 23 prefectures have developed "technopolis" programs that have brought together technology-driven industries in "small parks" and similar locales. Such efforts have already been of significant value to the economies of many prefectures.

The skill and adaptability of the work force is another key element of economic infrastructure. In the area of higher education, new universities have become centerpieces of recent technology-based economic development strategies. Some of the lessons learned regarding how to better link the educational programs of such universities to the economic needs of their areas might be applied successfully to Central European universities.

Development financing in the transforming economies is a critical need. But 20 years of development experience has shown that the problem of finance often is not primarily a lack of funds, but a lack of people who know how to invest wisely or how to develop high-quality business proposals, whether aimed at fostering new enterprise or helping old ones modernize.

Building an advanced infrastructure base made up of the six elements of hard and soft infrastructure will be essential to the success of the Central European economies in transition today.

Accessible Technology

Every modern economy needs a system of technology infrastructure to facilitate innovations in enterprise and enable growth and modernization of industry. Such infrastructure should include the following elements:

- **Technology discovery**: sources of basic and applied science.
- **Technology development**: providers of applied research in process and product development that provide a strategic advantage to industry.
- **Technology deployment**: suppliers and distributors of the most current "off-the-shelf" technologies needed to sustain productivity.

Available indicators for Central European nations that give a clear picture of accessibility to technology include: the numbers of science and engineering university graduates, numbers of scientists and engineers in research and development, total government research and development expenditures, and number of patents. The indicators in Table 1 suggest that, whereas Central Europe excels in technical discovery, so far it has been less adept at following through with the much-needed development and deployment of technologies.

The average number of Central European scientists and engineers performing research and development in 1987—4,537 per million people—compares favorably with West Germany's 2,386 in 1985, but the focus lies more heavily on research than on development. Although these statistics suggest that the level of technology accessibility is relatively high in Central Europe, it is important to keep in mind that the actual level of technological development and commercialization in these countries is significantly below that in the West. For example, in 1988, citizens of the former German Democratic Republic and Czechoslovakia received more patents per million population than did United States or West German residents, who claimed 199 and 261, respectively. Yet even a cursory study of the deployment of technology in the West and East reveals that the more sophisticated technologies found in the West are not available in like quantities or qualities in the East.

Table 1

ACCESSIBLE TECHNOLOGY IN CENTRAL EUROPE

	Science and Engineering Graduates per Million People, 1987	Scientists and Engineers in R&D per Million People, 1987	Government R&D Spending as percent of GNP, 1987	Patents per Million People, 1988
Bulgaria	635	5,641	3.3	173
Czechoslovakia	937	4,161	4.3	367
Eastern Germany	432	7,574	4.4	533
Hungary	481	2,105	2.7	130
Poland	381	1,133	1.5	74
Romania (1985)	800	6,607	–	127

Sources: Council for Mutual Economic Assistance; United Nations Educational Scientific, and Cultural Organization (UNESCO); World Intellectual Property Organization; SRI International.

Interestingly, despite Hungary's relatively low position according to the four measures of accessible technology, the country possesses a strong entrepreneurial spirit and one of the most vibrant software industries in the world. Given this base, minimal investment in Hungary's technological infrastructure could induce dramatic improvement in its economy.

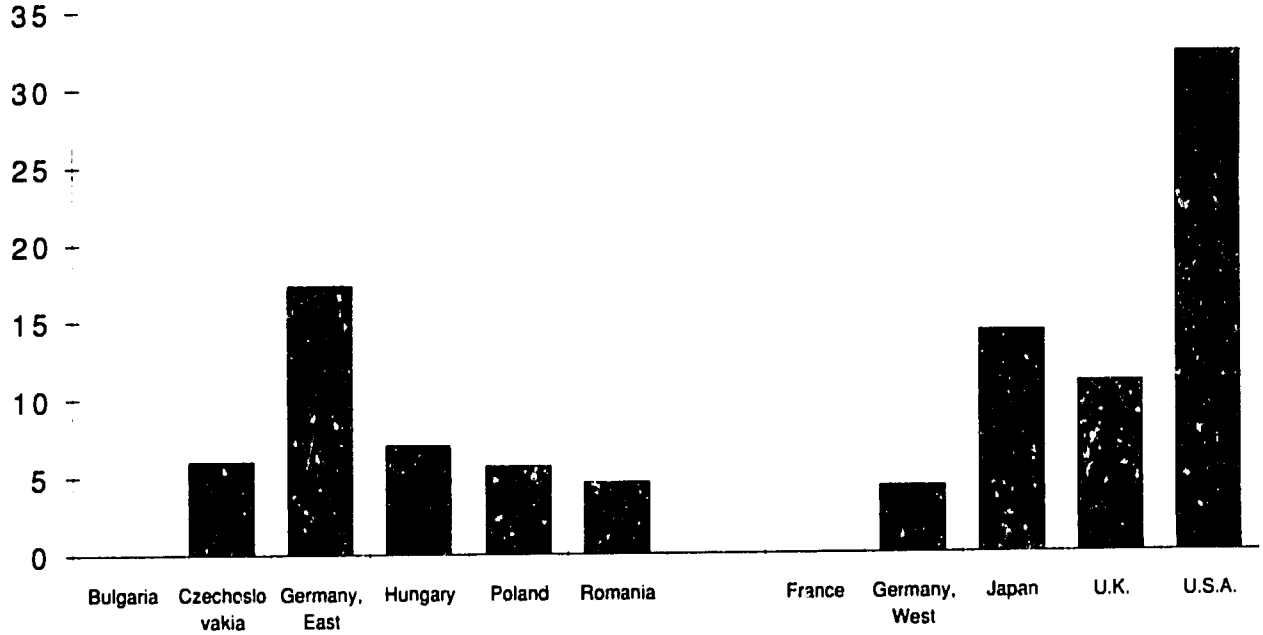
Adaptable Human Resources

A market-based economy needs a work force that is well educated and will respond to the diverse array of changing skill needs of competing industries. Thus, capable institutions are required in the following areas:

- **Preparation (elementary and secondary)**: educational institutions that provide basic skill and motivational development for a work force in an entrepreneurial economy.
- **Higher education**: universities and polytechnics that can provide advanced training for professionals in science, engineering, and management.
- **Continuous education**: public and private institutions that enable retraining of workers as well as renewal of skills and continued learning in rapidly changing disciplines.

Much has been made of the educational reforms in Central Europe and the liberalization of curricula, particularly in the social sciences. The rethinking of history, of economics, and of politics have all been among the hallmarks of the educational reforms in these countries at all educational levels.

Although Figure 1 suggests that fewer adults in Czechoslovakia, Hungary, Poland, and Romania have postsecondary educations than their counterparts in Germany, Japan, the United Kingdom, and the United States, the more important concern should be the quality of the education these students receive.



Source: UNESCO.

FIGURE 1
PERCENTAGE OF POPULATION OVER AGE 25
WITH POSTSECONDARY EDUCATION

The vocational and training aspects of educational reform aimed at providing for countries' human resource needs have met with varying degrees of success among the Central European nations. Central European universities, in particular those in Czechoslovakia, Hungary, and Bulgaria, have been increasingly emphasizing competition and risk taking, and many have acknowledged the role and responsibility of the university in producing professionals to lead in business, management, law, and even finance. As one rector from a Hungarian university recently observed, "it is most important to prepare [recent] university graduates to assimilate [the] principles of practical market economies [and] to get [them] acquainted with independent enterprise decision-making activities." ("Assessing the Role of Higher Education in European Economic Development," *Survey of Business*, Summer 1990, p. 16)

As both manufacturing and product technologies become more sophisticated in Central Europe, the demand for a better-trained work force, management cadre, and business leadership will grow and so will the demands on universities and institutes for training future workers. The human factor could turn out to be one of the most difficult challenges facing the leaders of transforming economies in the decades ahead. Workers themselves will have to relearn both the skills

and the work ethic needed to be productive; management, from the lower levels to the most senior, must be reeducated and motivated to think independently. The success or failure of the rebuilding of human resources in Central Europe will play a large part in determining the success or failure of each country's effort to restructure and rebuild its economy.

Available Financing

A competitive economy has financial institutions attuned to the requirements of industry at different stages of its life cycle. These stages and institutions include:

- **Start-up**: investment organizations that can provide financing for the early, higher-risk stage of new ventures, and support "proof of concept" technology research and product prototype development, (i.e., venture capital sources).

- **Expansion**: investment organizations, such as public and private banks, and private investors able to support working and physical capital requirements for growth of production capacity.

- **Modernization**: investment organizations able to recapitalize industries that must replace physical capital and retrain their work forces to adopt new processes and/or produce new products needed to compete.

Financial institutions in command economies have generally been guided by different goals and objectives than their market-based counterparts. Specifically, the functions of the financial infrastructure in command economies has traditionally been governed by the understanding that the entire country, including the banks, constitute a single economic entity. For example, in the command structure, a bank has little incentive to foreclose on bankrupt enterprises, since the bank itself has little to gain from such an action; the risk assessment of a possible investment in or loan to an enterprise does not have the same pivotal role it might in the market since everything, including the bank along with its assets and debts, is owned by the state; and the lack of competing financial institutions limits the banker's incentive to ensure the future health and prosperity of the bank.

The reform of banking structures and the introduction of venture capital to Central Europe has been fairly modest so far. Although central banks will continue to be an important factor for transitioning economies in the years ahead, other influences will also have significant impact on the ability of transitioning economies to reform their financial sectors and build solid financial infrastructures. Even Hungary and Poland, succeeding somewhat more than others in breaking up their banking systems and introducing competing banks, find their "private" banks fairly dependent on the central banks.

Among the more significant difficulties ahead for Central European countries attempting to rebuild financial infrastructures are their limited technology resources and the lack of trained workers for the financial sector. For instance, the computer technology needed to support a developed financial infrastructure is virtually nonexistent in the banking industries of transforming economies. On-line databases, facilities for transferring information from bank to bank or within a bank, and computerized record processing are not possible on a large scale. The majority of transactions are still done by hand, and records are kept in paper files, not in computers. Compounding the problems of the current technology gap is the fact that Cocom restrictions on technology transfers to Central Europe continue to limit access to many technologies and to slow the modernization process.

In addition, a new generation of bankers and financial experts must be trained to manage and work in developing financial sectors. The communist ideology that governed policymaking in Central Europe for decades deemphasized the need for banks and other financial institutions, asserting that it would diminish as society moved toward the achievement of communism. As a result, only limited training has been available for bank management and employees, and their responsibilities have been reduced over the years by the streamlining of banking services. Thus, one central goal of rebuilding the financial infrastructure in Central Europe must be the provision of improved training and education programs for workers in this sector of the economy.

Entrepreneurial Culture

A competitive economy has a culture that encourages entrepreneurship through both formal and informal means. This culture includes:

- **"Intrapreneurship"**: encouraging managers and workers within existing organizations of all sizes to be innovative.
- **Start-up of new businesses**: encouraging individuals to take the risks associated with starting new businesses.

Even in established Western economies, the comparative influence of entrepreneurial initiative on economic prosperity in different countries is difficult to measure. In the constantly changing conditions of the evolving market economies in Central Europe, it is even more difficult.

Nevertheless, empirical evidence strongly suggests that those Central European countries that have provided both more freedom for entrepreneurial activity and a legal framework supporting that activity show the most promise for successful reform. Although Poland has been the most

aggressive in setting up the legal policy structures needed for reform, as recent history has shown, improvements in economic performance have been slow to materialize because an entrepreneurial "culture" has not been as strongly encouraged there as is was in Hungary. In contrast, the strong entrepreneurial tradition in Hungary, combined with structural reforms, has bolstered that country's bid to develop a successful market economy. Implementation of limited market mechanisms under former party leader Janos Kadar provided the base for what is now the largest private sector in Central Europe. Of Hungary's economic output, a full 25% stemmed from private activity in 1990. A regional bellwether in the pursuit of market economics, Budapest has granted enterprises independence to bargain about production targets, price levels, capital investment, and material purchases.

In addition, Hungarian attempts to restructure the financial sector outshine all other individual efforts in the former Eastern Bloc. The Hungarian National Bank's monopoly on banking functions has ebbed with the emergence of more than 20 commercial banks—banks that now have the authority to handle limited foreign exchange activities. Moreover, despite the shortage of capital, Budapest has established a nascent stock market—the first in Central Europe.

Encouragement of entrepreneurial activity, accompanied by the rebuilding of the political and economic frameworks supporting reforms, is essential for successful transitions from the command to the market economy in all Central European countries.

Advanced Physical Infrastructure

A competitive economy provides the forward-looking physical infrastructure required by different sectors of the economy. An advanced physical infrastructure not only supports industry but can serve as an economic force by generating a demand for services, equipment, and materials that further stimulates the economy. Elements of advanced economic infrastructure include:

- **Telecommunication systems** and information services: essential to carrying out production and trade transactions within a country.
- **Transportation**: systems of domestic and international air, rail, and water travel and shipping services, including warehousing, customs, and trade services.
- **Power and energy**: efficient production of energy resources sufficient to meet industrial and consumer demand.

Telecommunication Systems

Of the many existing and potential impediments to the development of successful market economies in Central Europe, the lack of adequate telecommunications infrastructure is likely to

be one of the most difficult and costly to address. Not only do current Cocom restrictions on technology transfer slow the import of much-needed communication technologies and hardware from the West, but the majority of economies in transition lack the hard currency resources necessary to pay for services and supplies.

However, because the leaders of these countries understand the centrality of modern telecommunications infrastructure to the creation of prosperity in their developing economies, it is anticipated that together they will invest $100-$150 billion in an effort to update and expand existing dilapidated systems. There is little doubt that this modernization process will be lengthy, since a new generation of technical personnel and engineers must be trained, new technologies introduced, and new equipment installed.

The telecommunications infrastructure in Central Europe is far from homogeneous, and each country faces different challenges in modernizing. Of all the Central European countries (with the exception of the former German Democratic Republic), Czechoslovakia has the best telephone network and the highest overall telephone penetration with approximately 13 telephone lines per 100 people. When compared with the United States average telephone penetration of 48.1 telephone lines per 100, the figures for other Central European countries are striking (Table 2).

Table 2

PHONE LINES PER 100 PEOPLE

United States	48.1
East Germany	23.3
Czechoslovakia	13.0
Hungary	10.0
Soviet Union	9.7
Poland	7.0
Bulgaria	<1.0

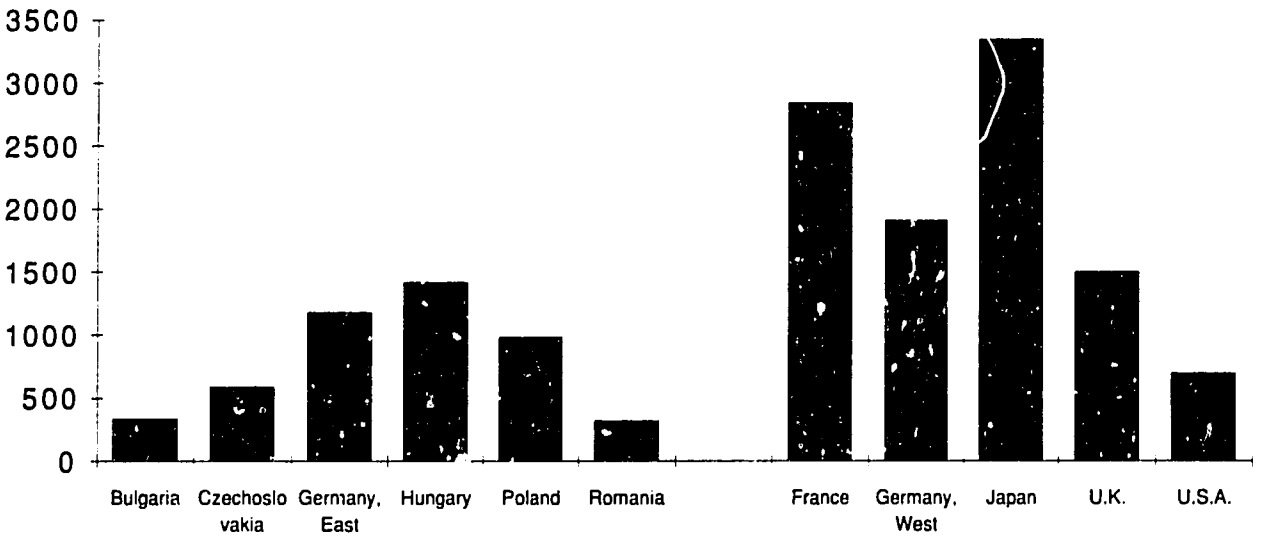
Source: *The World's Telephones*, AT&T

The development of telecommunications infrastructure in these countries is likely to be driven as much by personal communication needs as by the need to communicate data, both domestically and internationally.

Transportation

The transportation infrastructure in Central Europe is insufficient to meet the current needs of these countries and will be grossly inadequate for future economic growth. Previous capital investment policies did not place particular emphasis on developing transportation networks (including roads, railroads, airports, and ports and waterways); as a result, the state of the transportation infrastructure in Central Europe has fallen far below Western standards.

Whereas the *quality* of existing facilities has become one of the more important issues for many in this region, Figure 2 shows that, for highways in particular, *quantity* is also a pervasive problem.



Source: U.S. Central Intelligence Agency.

FIGURE 2
HIGHWAY DENSITY (Km per 1,000 Sq Km)

The low level of highway development in Central Europe is striking. Yet, to make matters worse, an even more difficult issue facing leaders today is that much of the transportation system is in such poor repair that it cannot be improved and must be dismantled and rebuilt. Railroads throughout the region are outdated, unreliable, and in very poor condition, and the modern technologies needed to handle cargo tracking and monitoring are lacking. Both highways and local roads are insufficient and grossly in need of repair. The quality of most airports is far below Western standards, and they are unable to handle the kind and quantity of air traffic required of developed, internationally oriented economies.

Although the former German Democratic Republic finds itself in the fortuitous situation of having West Germany to back up its rebuilding efforts, the repair and reconstruction of its roads and railroads alone is estimated to cost a staggering investment of at least DM200 billion over the next decade. The task of overhauling transportation infrastructures alone in other Central European Countries without outside assistance thus can seem overwhelming.

However, planning for and investing in a modern transportation infrastructure are essential to economic growth and prosperity in Central Europe. Because the entire region is in desperate need of transportation modernization, these countries have a unique opportunity to work together to develop a coordinated regional transportation system that could help both the local and regional economies mature successfully.

Power and Energy

Over the last several decades, Central Europe has pursued pursued energy-intensive industrial growth and, as a result, developed inefficient industrial bases that consume and waste inordinate amounts of energy in the production process. Unfortunately, the cost of making the manufacturing bases of these countries significantly more energy efficient is very high, discouraging significant change in both the industrial structures and consumption patterns of these countries in the near future.

However, some bold Central European leaders are developing alternative energy policies that could help their countries move toward cleaner, more efficient forms of energy. Czechoslovakia has been in the forefront of this effort and is slowly closing some of its brown coal mines and thermal power plants, looking toward cleaner fuels that burn more efficiently. In addition, the future share of gas fuels is expected to increase from 14% to 24%, while the share of nuclear and hydro power plants is also expected to increase from 10% to 20%. As Tables 3 and 4 suggest, Czechoslovakia plans to alter the structure of both its fuel and its energy-generation resources in an effort to meet the growing demands for cleaner, more efficient forms of energy.

Like other Central European countries, however, Czechoslovakia will find itself increasingly dependent on nuclear power in the coming decades and will have to grapple with the difficult social and environmental issues surrounding nuclear power development. Bulgaria's circumstances are particularly telling of the pinch Central Europe will feel as demands on its energy resources grow and its ability to meet the need is challenged.

Table 3

CZECHOSLOVAKIA: ENVISAGED TRENDS IN PRIMARY ENERGY CONSUMPTION
(Percent of Total Consumption)

Energy Source	1980	1985	1990	2000
Fossil fuel	61.9	60.7	56.3	47.6
Crude oil and gas	34.2	33.4	33.0	33.5
Nuclear energy	1.5	3.3	7.4	14.4
Other sources	2.4	2.6	3.3	4.5

Source: Miroslav Cibula, "Nuclear Energy and the Development of the Czechoslovak Energy Sector," *Planovane Hospodarstvi*, No. 9, 1988, pp. 28-42.

Table 4

CZECHOSLOVAKIA: ENVISAGED SHIFT IN THE SOURCES OF ELECTRICITY
(Percent of Total Output)

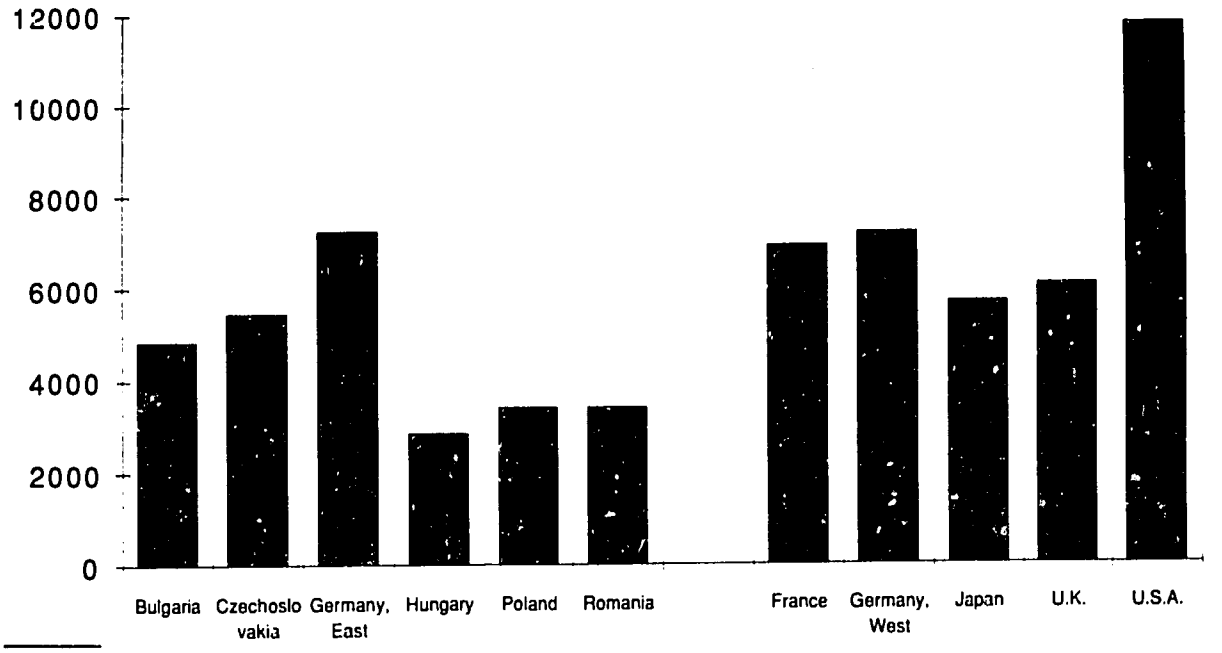
Electricity Source	1985	1990	2000	2005
Thermal power plants	67.1	55.0	34.0	23.2
Nuclear plants	14.6	27.7	50.9	62.1
Large hydroelectric plants	5.2	5.6	7.2	8.1
Small hydroelectric plants	13.1	11.7	7.9	6.6

Source: Miroslav Cibula, "Nuclear Energy and the Development of the Czechoslovak Energy Sector," *Planovane Hospodarstvi*, No. 9, 1988, pp. 28-42.

Bulgaria's consumption of electricity increased from 48 billion kilowatt-hours in 1985 to approximately 55.5 billion kilowatt-hours in 1990. Currently, Bulgaria has only one nuclear power plant, the Kozloduy Nuclear Power Plant. Although some of the pressure to expand its nuclear power industry was reduced by an agreement signed last year to purchase 4,750,000 tons of petroleum from Iraq (Bulgaria's largest debtor nation), recent events in the Persian Gulf make the immediate realization of this agreement unlikely.

As Figure 3 indicates, total electricity production in Central Europe is noticeably below that in the West.

In meeting the challenges of restructuring their economies, improving their industrial output, and raising their standards of living, the countries of Central Europe must develop both industrial policies encouraging less-energy-intensive production and energy policies devoted to more efficient energy production.



Source: U.S. Central Intelligence Agency.

FIGURE 3
ELECTRICITY PRODUCED PER CAPITA
(Kilowatt-Hours)

Quality of Life

A competitive economy has a living environment that is attractive to highly skilled, mobile individuals. This might include:

- **Public services**: high-quality, efficient public services, such as social welfare and public health services.
- **Arts and culture**: arts and cultural resources of sufficient quality and diversity.
- **Environmental protection**: effective hazardous waste management and disposal systems, and a well-preserved natural environment with recreational opportunities.

In evaluating the economic infrastructure of a region, economists traditionally have paid little attention to quality-of-life indicators. Yet in Central Europe, with its extraordinary economic and social upheavals, some consideration of this issue is critical to understanding the likelihood of significant long-term economic transformations in the region.

Indicators reflecting the quality of life are numerous, although generally indirect. Frequently used indicators include the number of television sets per capita, infant mortality rates, the relative numbers of physicians in different societies, and the quantity and quality of social services available to populations.

As the data in Table 5 suggest, the citizens of the former German Democratic Republic, Hungary, and Czechoslovakia have greater access to television than do their neighbors. The regional average of 258 television sets per 1,000 people is one-third lower than that in West Germany and two-thirds lower than the average in the United States. Not surprisingly, increased spending on such consumer goods is a priority for all Central European nations.

Table 5

QUALITY OF LIFE IN CENTRAL EUROPE

	TVs per 1,000 People 1987	Physicians 10,000 People 1987	Infant Mortality (per 1,000 live births), 1989
Bulgaria	187	35.7	15
Czechoslovakia	285	35.7	13
Eastern Germany	374	22.7	9
Hungary	276	32.2	18
Poland	263	20.4	18
Romania	166	17.5	23

Sources: World Bank; Organization for Economic Cooperation and Development; U.S. Central Intelligence Agency; CMEA; UNESCO; Worldwatch; SRI International.

The average number of physicians per 10,000 people—27.4—places Central Europe on par with West Germany, which claims 26.3. However, Central Europe's decidedly higher infant mortality rate suggests an inferior health care system. The recent explosion in the reported number of AIDS cases among children, together with the 23 infant deaths per 1,000 live births, will most likely solidify Romania's position as the worst health-care provider in Central Europe.

Where environmental issues are concerned, the lack of uniform statistics on Central Europe makes comparison of the ecological damage in various countries difficult, yet two variables may provide a relative indication of environmental decline: the level of sulfur dioxide emissions and the damage to forests from pollution (Table 6).

The prevalence of high-sulfur brown coal, along with the lack of scrubbers and other pollution control equipment, has made air quality in Central Europe among the worst in the world. In the past decade, while emissions of major pollutants declined or remained steady in the West, they continued to rise in Central Europe. For sulfur dioxide—the pollutant for which data are most complete—the region's average deposition density of 119 pounds per acre is more than double that of the EC, which has a deposition density of 53 pounds per acre. Sulfur dioxide is not the only pollutant in the atmosphere: Poland, for example, produces dangerous quantities of

nitrogen oxides, chlorides, fluorides, vaporized solvents, carbon monoxide, and other gases. The result is air pollution 50 times above appropriate limits in nearly every major city, according to *Environment* magazine. Similarly, health authorities claim that air pollution accounts for 1 in 17 deaths in Hungary.

Table 6

ENVIRONMENTAL INDICATORS FOR CENTRAL EUROPE

	Sulfur Dioxide Deposition Density, 1984 (Pounds/Acre)	Forest Damage, 1988 (Percent Total Forest Area)	State Parks and Forests Density, 1987 (Hectares/Sq. Kilometer,)
Bulgaria	60	34	30
Czechoslovakia	228	44	36
Eastern Germany	151	35	25
Hungary	96	25	18
Poland	101	15	28
Romania	79	–	26

Sources: World Bank; Organization for Economic Cooperation and Development; U.S. Central Intelligence Agency; CMEA; UNESCO; Worldwatch; SRI International.

Forests also suffer from environmental negligence. Except for Romania, which has not participated in international information-gathering efforts, all countries of Central Europe have documented damage. The findings give cause for serious alarm: in four of the five countries, a quarter or more of the forests show significant signs of destruction. Czechoslovakia, Europe's worst case, reportedly has lost 80,000 acres and suffers pollution damage in 44% of its forest resources. Unfortunately, experts suggest that even these sobering statistics underestimate the extent of the devastation. Although local environmental activism is on the increase, it will not be enough. The governments of the Central Europe economies will need to find hard currency to address the pervasive and major environmental problems confronting their nations today.

Conclusion: Some Advantages of New Approaches

Over the past two decades, many countries, including Japan and the newly industrializing economies have shown how quickly governments and industry can shift investment, build up regions, train people and make firms technologically more competent. One of the major challenges facing Central Europe today is how to make a timely and successful transition to a market economy. Although each previously socialist economy has its own unique set of problems, successful transition in each economy in the 1990s will require, among other actions,

the building of strong economic infrastructure, focus on the development of economic clusters, and more concentration on economic strategies at the regional as opposed to national level. All three of these have been found, at least in some measure, to be prerequisites to success in Western market economies.

Undertaking sustained efforts to develop and apply these three interconnected principles in previously socialist countries now undergoing fundamental change could significantly help their economies meet the challenges they face. Such a strategy could provide a means to productively guide the reform and development of the bureaucracies (e.g., in education, R&D, transportation) needed to continue the work in the years ahead. Each major system of economic infrastructure has its own tradition of institutional practices and can be transformed into a more efficient engine of economic development by changing practices that no longer fit economic need. Although the task of developing and implementing such strategies in Central Europe will not be easy , it clearly can and must be done.

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