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CONSIDERATIONS ON ADVANTAGES AND DRAWBACKS OF AN INFRASTRUCTURE-ORIENTED DEVELOPMENT STRATEGY

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SUMMARY

The starting point of our paper dealing with the advantages and drawbacks of infrastructure-oriented development strategy is that one should not base economic policy on the assumption that the best hoped political strategy will undoubtedly prevail. From among the five possible scenarios evaluated with the three positive ones similar infrastructural networks are attached. All of them can be characterised by the fact that they try to ease the centralisation of the networks and promote internal, regional development with a kind of restructuring. At the same time, the scenarios to be avoided would be promoted by reinforcing the existing, hierarchic, centralised infrastructure network structures. In such a situation the paper expresses a definite standpoint. It is not enough to be for infrastructure orientation in general, since while constructing networks contributing to restructuring have an urgent need, the development of other and opposite kinds of structure-preserving networks would be explicitly harmful.

Our differentiation gained from political scenarios is in line with the experience to be gained from the analysis of the state and development tendencies of existing large European structures such as gas, transport and electricity networks. Distributive networks able to secure sufficient local provision are a sufficient basis for the crosspoint effects of larger, magistral networks to have positive impact on the area. On the other hand in underdeveloped, ill-provided regions magistral networks easily can produce enclave-like, Third World type effect raising tension, in rather than promoting development and thereby rather conserving instead of liquidating backwardness. Only a cautiously and selectively initiated infrastructure oriented economic policy taking all the above mentioned facts into account might serve as a development alternative for the country.

1. INTRODUCTION

According to a popular, hardly contested viewpoint Hungarian economy of these days needs an infrastructure-oriented development strategy in order to start on a growth path. The present study does not take this statement as evidence supporting such a strategy, rather it tries to collect arguments *for* and *against* such a development policy.

The preliminary assumptions that on which our survey is based are the following:

* There are several possible scenarios of international politics; therefore it is an unreasonable choice to base all of our future plans solely on picking up the most favourable one.
* According to political scenarios, we should think about which is a realistic one, which one is truly favourable for Hungary in the long run and, moreover, what infrastructure-development strategies are compatible with the individual scenarios?
* It is indispensable to perceive infrastructure not only as a *scalar* factor to be measured in economic dimension but as a spatial, *vectorial* factor too. The kind of investments we want to promote under the slogan "more infrastructure" do matter. There are infrastructures whose establishment would be harmful to the country and this can be proved by both economic and extra-economic arguments.

2. COMPETING POLITICAL SCENARIOS

In the background of present Hungarian development strategies there lurks the idea - sometimes tacitly sometimes *expressis verbis* - that *the future of Europe is determined for sure by the Maastricht process* and Hungary's task is *to join this process - the sooner the better.* (In the meantime we *should gain their confidence by eminent behaviour* [i.e. behaviour they expect from us]).

We do not think it is our task to analyze the whole three-pole world economic system and the likely role of regions around individual poles. We only say that in our opinion, one might challenge all three italicized statements in the previous paragraph. These are things that might happen, but *there are* alternatives which should also be taken into account. One should acknowledge at the same time that at present we have no mature alternative to them which would define another type of development. But without thinking over the possible alternatives, the actual hypotheses cannot be considered mature.

What concerns the actual Hungarian situation, we sketch up five political scenarios as considered important for thinking about the infrastructural background. They constitute desirable or undesirable alternatives to the future, neither of which can be excluded as totally irrelevant.

2.1. "Successful Integration with Europe, Closing the Development Gap"

This is the official strategy at present. This scenario thinks that the European integration process will be successful, and Hungary's aim should be to join the European Union as soon as possible.

2.2. "Unsuccessful, Semiperipheric Integration with Europe, with a Subservient Economic Role"

Naturally enough, this "Third World" type role is not our goal but we should think about whether we can by sticking to the strategy of catching up, avoid such an outcome, i.e. to be a follower of and dependent on Western Europe[1]. Whether not it is just our trying so hard to catch up that creates a situation whereby we build an infrastructure *appropriate for a follower model* thereby cementing ourselves into the position of a constant loser?

2.3. "Ideas about Central-European Integration"

From time to time, when the environment of the Central-European region changes and the future of the region becomes open for a historical moment, ideas about regional cooperation, a confederation of the Danube-valley or some other form of Central-European integration surface again. Miszlivetz[2] in his study mentions several liberal thinkers who adhered in their 1989-90 enthusiasm to these ideas. At the same time Péter Kende[3] denounces the idea of federation as a beautiful dream without substance, an antiquated notion from history. He summarizes his opinion in six points, namely:

* The necessary complementation between the economies of the region's countries does not exist.
* As to the economic development level, there are large discrepancies between them.
* Due to contested territories the states of the area cannot form a confederation.
* There is mutual distrust and disdain among them.
* There is no common language acceptable for all.
* Finally, Kende challenges the meaning of an association outside the European Community when the latter accepts new members only on an individual basis.

A special actuality is given to this problem by the fact that following an initial euphoria, the *West* now requires preliminary evidence of Eastern European internal ability to cooperate. When dealing with infrastructural networks we shall return to the question of Western-European countries requiring as a precondition of our attachment to the UCPTE system, the proper functioning of the common electricity system of the Visegrád countries.

Beyond ideas about *purely Eastern* and Central-European integration, there are ideas about *East-West* cooperation, a kind of combination of the former two. Here we can include nostalgies about the Austro-Hungarian Monarchy, the

Pentagonale, and its successor, the Central-European Initiative. Its original idea was born in the enthusiastic atmosphere of 1989 when the difficulties of transition were not fully appreciated; as a result of later developments Italy and Austria are now much more cautious in their steps towards their Eastern neighbours; one may venture the opinion that Eastern transformation speeded up the EFTA countries' *flight* into Europe.

2.4. "An Antidemocratic Coup"

Like the "Third World" model which preserves underdevelopment this too is an undesirable scenario but cannot be dismissed out of hand.

2.5. "A Positive (Environment-Conscious) Third Way"

Finally we have the idea of a third way trying to avoid - relying on green theories - the deadlocks of Western development, a strategy whose aim is not to imitate industrial societies. In moments of political upheaval both Western and local commentators put their faith in the environmental-consciousness of post-socialist people, a forecast based on the mass assistance of several environmental movements. This turned out to be an illusion. Even more in the East there is no social readiness at present to start a new experiment instead of copying Western examples. At the same time it is plain that the long run winner will be the country that takes the first step in this direction. *The real challenge of the age will be to find not an infrastructure-oriented, but an environment-oriented development path.*

To sum up the five models we can say that the first, the third and the fifth, are the desirable, expected, positive scenarios, namely:

* *Successful integration into and catching up with Europe.*
* *Central-European integration ideas.*

* *Positive (environment-conscious) third ways.*

The second and the fourth are undesirable, namely:

* *Unsuccessful, semiperipheric integration into Europe with a subordinated economic role.*

* *Antidemocratic coup.*

These last two are scenarios whose materialization cannot be precluded.

The distinction is important since, as we will show, the spatial system of infrastructures undoubtedly has a feedback effect on political scenarios. Without assigning probabilities to individual scenarios or selecting a preferred variant it should be plain for us that *we ought to favour infrastructure development that eases the way for preferred scenarios and diminishes the chances of undesirable ones*. To be able to get closer to the possibility of such kinds of selection, we shall search for links between the social-economic background of individual scenarios and infrastructural systems appropriate for them.

3. RELATIONSHIPS BETWEEN INFRASTRUCTURE NETWORKS AND SOCIAL-ECONOMIC STRUCTURES

3.1. "Antidemocratic Coup"

It will be practical to start the analysis with the infrastructural network of an *antidemocratic system*. Since the logic of infrastructure development of the past decades was analysed through and through it is commonplace by now that centralised political control involves not only centralised distribution of resources but also infrastructural networks similarly centralized in their spatial structure. There are dimensions - the system of settlements, the county system, the transport network - where inherited infrastructural networks were already centralised (as a remnant of the rivalry between Vienna and Budapest,

then the capitals of a much larger country than today). In these cases the development after 1948 built on this existing structure while newly created centralised structures where it found none - in education, health, trade. Therefore the statement asserting that economic management *simply neglected* the development of infrastructure in the last four decades is one sided. We should say rather that resources were given only to infrastructural developments serving some political, power, or strategic goal such as linking the capital with county centres by road, rail, multiple K-lines (=exclusive used telephone lines), transmission of (central) radio and TV programs or the above mentioned "distributive" systems. At the same time central management of resources could assure that certain goals never be given the necessary money, including public telephone, local papers, local studios, and anything that makes interpersonal communication easier and reinforces local autonomy.

The same logic prevailed in international relations too. First there was the autarchy, the closing down of many existing frontier station, while on the other side the preference of Soviet-Hungarian economic contacts - gas and oil pipes, electricity network, two-way electrified railway lines. This was in line with the trade orientation but hindered contacts in other relations and preserved the unilateral dependence of the economy.

It does not need special proof that an extremist, antidemocratic political turn trying to liquidate multiple contacts would welcome such a centralised, closed system and the re-establishment of the corresponding infrastructure networks.

3.2. "Unsuccessful, Semiperipheric Integration to Europe with a Subservient Role"

It is somewhat more difficult to see why the existing domestic infrastructural network is a good basis for a semiperipheric, "Third World" type development too. The

projects and suggestions of doing away with the infrastructural backwardness of Eastern countries" try to connect the centers of these countries - Budapest, Prague, Moscow, Warsaw etc. - with Western Europe: through highways, high-speed railways, enlarged or doubled airports. This means that investments would keep on flowing to and reinforcing the *centers* of these countries, exploiting the fact that due to earlier centralisation everything is attainable from these centers. The situation whereby everything that is new enters the country through the center is reinforced. What remains for the "countryside" is to fiddle on the road leading to the center. It might be always enlarged somewhat but for something else there will be no money left. Thus there is no way to create a new spatial structure quite the contrary: the present one is reinforced and thereby the mode of distribution too is preserved - with the only not negligible(!) difference that now these capitals are turning not towards Moscow but towards Brussels.

3.3. "The Central-European Integration Ideas"

The analysis above demonstrated that the more we are insisting on our "entry into Europe" before everybody else and neglecting also the domestic needs for restructuring, the greater will be the chances that we create the infrastructure of an unsuccessful, semiperipheric attachment instead of the infrastructure we need for the long run. This constrained hurry makes competitors of our neighbours and blocks contacts with them. This is especially useful for business circles trying to seize Eastern-European markets because they can negotiate with the competitors one by one. Maybe they might build up in three places the "central airport", the "distribution center" of the area.

Concerning electricity, Western Europe does not want to export it; rather it wants to rule out the possibility of Eastern-Central-European countries being dependent on them as they were on the Soviet Union. In this respect the Western

infrastructure development strategy is different from that of the transport ways necessary for the export of production/consumer goods. Here not separate *magistral lines* to Budapest or to Prague are bringing association nearer. UCPTE (the electricity system of the Western countries) changed its statute in matters of admission. It no longer examines new candidates one by one but forced the Visegrád countries, all aspiring for membership, *to prove,* through their common CENTRAL network, *that they are able to cooperate troublefree.* (The first trial was arranged at the end of September 1993, and since that time, due to the separation of the Ukrainian system the "trial has been perpetuated" for a longer time).

It would be wise to think about what justifies that these same countries should follow a totally different, competitive strategy in case of the other infrastructures - trade networks included? At present there are two arguments *against* cooperation. One is the already mentioned Western business interest in partitioning the market. The other is the competition among the Eastern countries in which every one of them wants to be center (transit center, East-West go-between, trade center, financial center, market center, touristic center, infrastructural center etc.) before and *at the expense* of the others.

3.4. "Successful Integration into Europe, by Catching Up"

The starting process of intra-European integration, at least in the case of the *Six*, later the *Nine* and the EFTA, served as an example that countries which attained a high level of development separately (*n.b.* partly by exploiting their colonies outside Europe) can start an integration course after having expanded their autonomous structure. If this path might be imitated at all it can be done only through *the development of adaptivity, the transformation of internal structures, and the building out of certain stabilisation mechanisms* before aspiring to association.

If, instead, *development is restricted to the physical preconditions of attachment* then we will end up in the asymmetric, "Third World" type strategy which we named in the above *unsuccessful integration*. The present study defends a standpoint whereby *forceful integration of an underdeveloped and a developed structure results in the rigidity of the underdeveloped, or its dependence and distortion* so that the benefits of the attachment are felt only on the developed side.

Concentrating our attention to the infrastructural aspect of the problem we should stress the fact that we should first of all find out *what types of networks* contribute most to the development of the country. In the next chapters we will try to prove the statement that this goal is best furthered by networks assisting local effort, making local contacts more multilateral and dense, and not networks forcing them into predetermined channels.

These networks are however not those magistral lines which would liquidate the lacunae of East-West infrastructural links such as high speed railways, highways, directed pipelines. *At least parallel* with the development of magistral lines, one should secure similar resources for infrastructure required by internal restructuring. Otherwise, an *infrastructure-oriented* development strategy becomes a mere ideology for building out the magistral lines needed by foreign investment and *does not serve* the country in its efforts to catch up.

3.5. "Positive (Environment-Conscious) Third Way"

For thinking which stresses environmental values, magistral infrastructural constructs are even more "suspicious". In this case, not only the sequencing is in question but also the *necessity* of *highways* (good only for generating new travel needs). Within this value system the reduction of unit and total energy consumption, economy with materials, and recycling are all goals resulting at the same time in

diminished transport needs. Less travel is needed if local business potentials are better used and, if production and services are developed within human scale distances. All this is assisted by a price system taking into account transport, travel, material and energy consumption as their real costs.

I do not want to go here into the details about the amount of time needed for such a value system to prevail either in developed countries or in Hungary. I want only to stress the fact that an environment-oriented economy also requires a certain kind of infrastructure which is in line with the dense local networks required by a more autonomous local economy.

*

To sum up the relationships between the five models and infrastructural structures we can assert that the positive, desirable models:

- *successful integration to Europe with catching up,*
- *Central-European integration ideas* and
- *positive (environment-conscious) third way*

require a bottom-up infrastructural network making local contacts more dense and connecting regions with similar levels of development. However, the development of the two negative, undesirable scenarios:

- *unsuccessful, semiperipheric integration to Europe in dependent role* and
- *antidemocratic turn*

are more likely if we neglect the development of local infrastructures and reinforce hierarchic, centralised infrastructural systems.

Social-economic scenarios and their evaluation have a direct impact on our choice among infrastructure development strategies.

In what follows I shall turn to actual examples, gained from transport and energy networks, and I shall distinguish

between *magistral* and *distributive* type infrastructure systems. I shall also present the different impacts of these types.

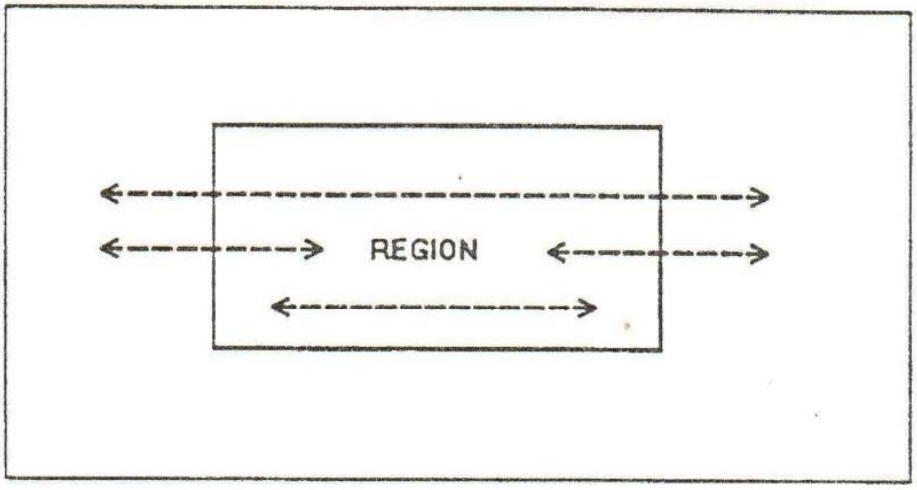
4. TENDENCIES IN THE CONSTRUCTION OF INFRASTRUCTURE NETWORKS

4.1. Tendencies in the Development of European Transport Networks

Whereas nobody challenges the statement that infrastructural networks have an impact on the region where they are located, it is difficult to find out what this impact actually is. Plogmann[4], relying on *spatial impacts* distinguishes three main interrelationships between transport and a region. (Figure 1)

Figure 1

Transport Links Relative to a Region



Source: Plogmann

In the first case the infrastructure traverses the region without having any considerable impact. (Highway with few crossroads, high speed railway without stations). This is the pure *corridor effect*. In the second case there is better

contact between the region and the outside world, but here it is important how many such opportunities there are. Peripheric regions are characterised by being *stringed on one thread* whereas with more variegated, more dense contacts there is a *crossroads effect*. In the third case depicted contacts *within the region* multiply the effects that improve the internal efficiency of the region.

Vickerman adds[5] that the above mentioned contacts may appear within the same infrastructure as different tendencies. He himself drops in what follows the point of view concentrating on *physical vicinity* and introduces two other points of view: the *functional position* of the region and the *eligibility for assistance*. Both criteria stress that *the potential development of a region due to infrastructure is largely determined beyond the infrastructure itself, by the starting position of the region concerned. Namely, its position within the larger environment and its earlier development level help determine potential development*. By varying these latter criteria the territory of the European Community might be divided into four catchment areas[6]:

* Core areas, main agglomerations (London, Paris, Frankfurt, Cologne, Dusseldorf, Amsterdam, Rotterdam etc.)
* "Shaded areas" between the above poles (Greater-London, Ile de France, Kent, Northern Pas-de-Calais, a large part of Belgium, Limburg etc.)
* Rapidly developing new poles outside core areas (Eastern-England, Rhone-Alpes, Stuttgart, Hannover etc.)
* Finally the peripheries: Wales, Scotland, Ireland, Mid- and South-Italy, Spain, Greece.

If we analyze further the *internal development level* of a given region we can state that the same infrastructure has different impacts on more efficient and backward regions. Competitive producers gain new markets through the new, long-distance contacts, while the producer operating in the past, relatively closed local market gains *new competitors*.

Although this might seem to result in the short run in a favourable selection of producers, which is good for the consumer, the reduction of local production results in *loss of local jobs* and thus in a loss of purchasing power for the local consumer in the long run. This makes the market unstable in the long run even for the remote producer.

Despite recognising this and other important global factors it has been the practical experience of the European Union that only those projects can survive which *promise direct, short-term benefit* for some influential group, not least in the form of large investment works. The indirect and longer-term, both positive and negative, impacts of transportation do not weighing much in the decision.

It is instructive for us how Vickerman when dealing with the West-European practice blames transport development strategies that concentrate on transport needs only. "The problem with transport driven approach is that it ..... emphasises the inter-regional elements of the network at the expense of the intra-regional elements and ignores the specific needs of a region's economic structure." We should rather distinguish the "*non-spatial* and *spatial* impacts. Non-spatial are simply the effects of infrastructure investment on the aggregate level of economic activity and on productivity and competitiveness. Spatial impacts consider the way in which infrastructure can lead to differential performance in different locations, either between regions or within regions."[7]

The analysis of non-spatial impacts relies on the perception of infrastructure as a public good. According to Biehl[8] "public goods" are characterized by the following properties: *indivisibility, non-substitutability, irremovability and parallel use by several users*. Dealing with local differences he says that one should measure not only the level of *provision* with infrastructure but also infrastructure use relative to the stock of private capital. In certain less developed regions there is outright overcapacity of infrastructure due to a development policy

which tried to *compensate* regions with infrastructure. At the same time *access* to the region is not continuous, crosspoints are scattered and therefore individual crosspoints gain importance, if there are any crosspoints in the region at all. But even if there are crosspoints, a characteristic of large-scale infrastructure is that a large group of both travellers and non-travellers are benefitting from the service who are in large part living outside the region, (at other crosspoints or away from major lines) but the costs are fully born by those living in the given region. This means a certain redistribution among individual regions and it is no more certain that benefits are reaped by those who built the infrastructure on their territory.

4.2. Tendencies in the Development of European Natural-gas Networks*

Even internationally, trade of natural gas only started in the early 60s: it first meant the pipe connection between the Groningen natural gas fields in Holland and the neighbouring countries, and an Algerian natural gas liquidizer constructed in 1964 using American technology together with the installation of the European receiving station. Soviet natural gas entered the European market in the next decade from a pipeline built to Germany. The major lines in Europe were constructed in these three 'climatic' directions i.e. sources of the Atlantic, sources of the Mediterranean and Soviet sources (*Figure 2*). This, at the same time, meant the formation of two different types of gas supplying systems.

The Atlantic *distribution* system is an organic development of local networks relying on local sources, where, with some reminiscence of the operation of electricity networks, exports could be accounted for in the form of

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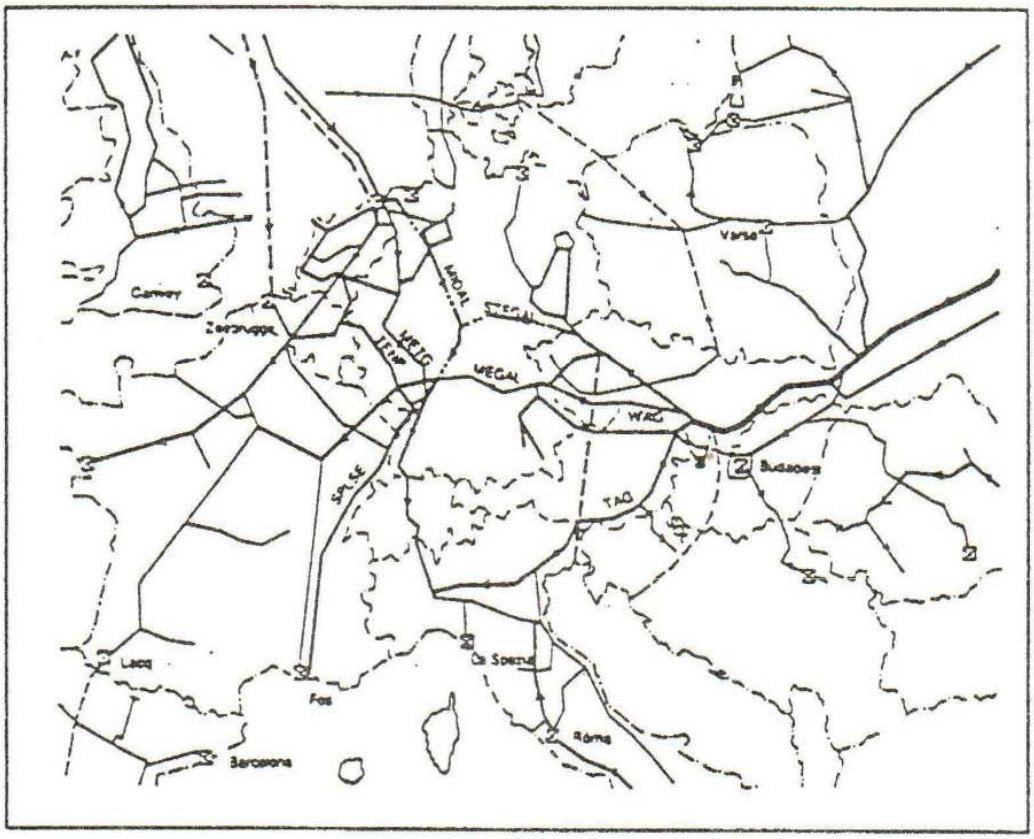
* This chapter was written on the basis of the article of Lajos Mramurácz.

equivalent amounts through chain-transactions between neighbouring areas.

Unlike the above, the main feature of the *magistral* system is the construction of long, independent, large-diameter export target lines. These are built in cases where the source country cannot itself finance the production, and its supply network is also deficient. The user of the gas will then provide funds in order that the gas should reach him/her after overcoming the local difficulties. While technically this is up-to-date and it represents a high level of development, in the source country it results in an enclave-like formation to produce and transport exclusively raw material independently of the local economy. This was characteristic of export departing from both *Algerian* and former *Soviet* territories.[9]

Figure 2

Possibilities of Diversification in the European Natural Gas Pipeline System



Source: Mramurácz

Figure 2 provides a good distinction of the three predominant destinations. Norwegian gas from the North sea together with the Dutch gas is fed into the system from the Atlantic. (In 1989 gas exports of these two countries totalled 60 billion m^3). From the south, besides the liquid gas supplies already mentioned (this is how just about yearly 16 billion m^3 of natural gas arrives in Europe from Algeria), TRANSMED, the 3000 km Algeria-Tunisia-Italy magistral pipeline was completed in the 80s. In 1989, it carried 11 billion m^3 of gas into Italy. Ukrainian-Russian gas comes from the south through Slovakia and branches off in the Bratislava region to travel on towards the Czech Republic, Germany, Austria, and Northern Italy. In 1989, a total of 100 billion m^3 of Soviet gas exports were shared on a 50-50 basis by Western and Eastern Europe. (Hungarian imports of the latter amounted to exactly 6 billion m^3.)

Natural gas supply systems reaching into Europe from various directions apparently merge in German and Northern Italian soil. It was primarily the interest of these two countries to secure the nearly 50 billion m^3 German and just below 30 billion m^3 Italian gas imports from several sides. Linkages to the pipe networks, however, make it possible even for other countries to alter the one-sidedness of that import possibility now that the distributive use of magistral axes can take place on a continental scale.

4.3. Tendencies in the Development of European Electricity Networks

In Europe five major electricity systems are operating: UCPTE linking the continent's countries on the West side of the former iron curtain, NORDEL bringing together the Scandinavian countries, the UK system operating on the British Isles, UPS embracing the former Soviet Union and IPS uniting the other former socialist countries. The latter two were linked up until recently, with a centralised, centrally managed dispatcher-service, making use of the possibilities

of carrying electricity over long distances. On the borderline of the "Eastern" and the "Western" system there was a technological iron curtain too; two separate systems were working on the two sides independently from each other though on the same frequency.

The Western system is decentralised: UCPTE, NORDEL and the UK system are insulated from one-another by a rectifying valve. Decentralised management prevails within individual systems too, based on the principle that individual countries should provide for a balanced production and use of energy. Although export and import of energy is possible it is regulated by bilateral contract between the parties concerned and guarantees to this effect might be included into country balances. Decentralised operation is backed by severe quality prescriptions and quantity obligations. These obligations concern partly the network (every defaulting section should be replaced) and partly the existence of capacity reserves both within power stations (to be connected within seconds) and in the network (to be connected within minutes, automatically). Considering that the share of power plants older than 20 years is below 10% in the UCPTE and around 50% in the IPS/UPS, the chances for breakdown are larger on the latter side.[10]

The size of larger systems[11] is demonstrated by *Table 1*. Comparative data for the East refer to MIR which in 1988 embraced not only the Eastern-European countries but also the Ukraine and Moldova.

The changes of the past few years naturally had an impact on the mentioned networks and even more on ideas about the future. The West and East German systems were linked through four 380kV lines, thereby allowing the Polish and the Czechoslovak network, and through them the Eastern system, acquire a direct-current link to UCPTE.

Hungary, in the summer of 1990, first among the Eastern countries, announced its intention to join the UCPTE system.

Table 1

Characteristics of Large European Electricity Systems in 1988

Characteristic	UCPTE	NORDEL	MIR
Population [million]	300	23	170
Area [1000 km²]	2280	1260	1628
Built-in capacity [1000 MW]	371.1	83.4	172.4
Maximal performance [1000 MW]	220	49.1	121.9
Max.performance/built-in cap [%]	59 %	59 %	71 %
Electricity production [billion kWh]	1400	338.4	811.4
from this			
by thermal power station [%]	42.9 %	17.5 %	78.4 %
by nuclear power station [%]	36.9 %	28.0 %	16.8 %
by hydroelectric station [%]	20.2 %	54.5 %	4.8 %
Electricity production [kWh/cap]	4700	14700	4800
Network 220kV and above [1000 km]	150	27.4	92.6

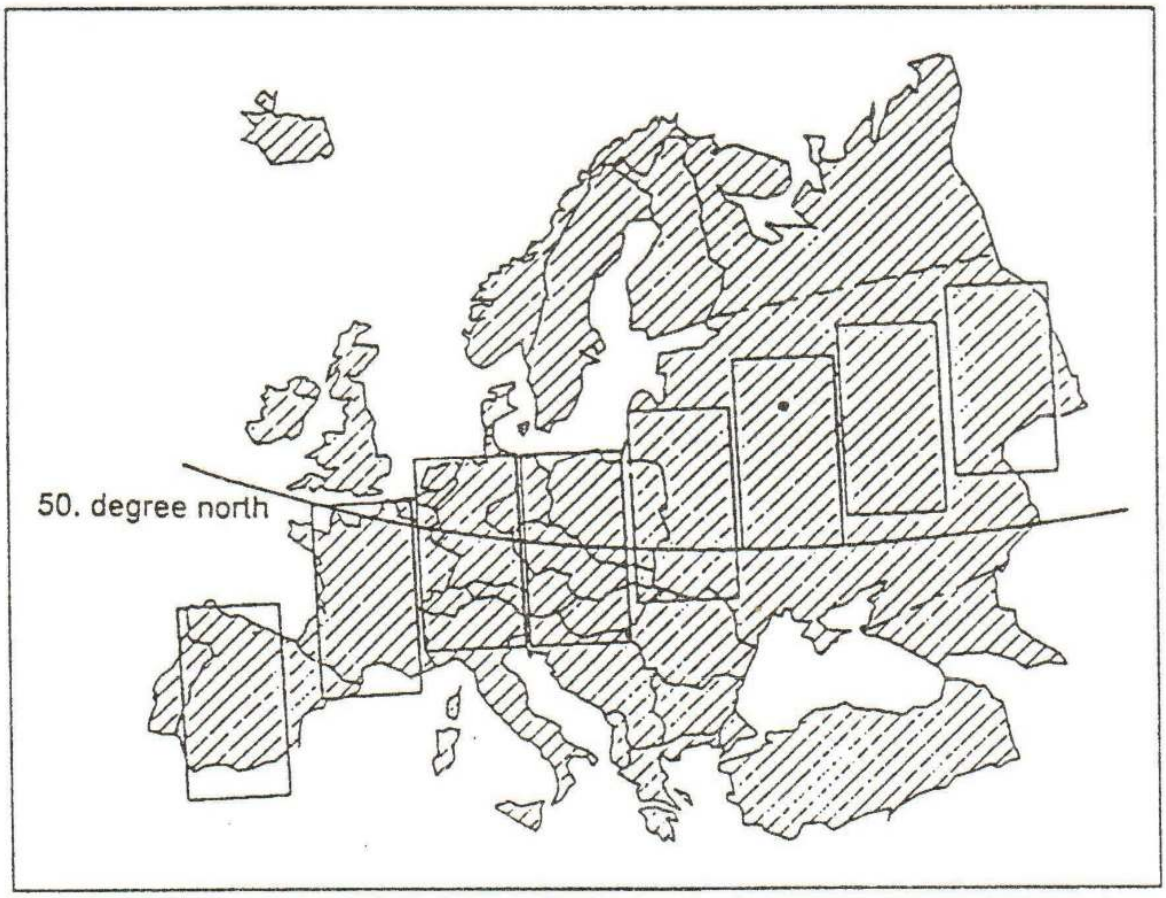
Source: Kucherov-Rudenko-Voropai

But soon representatives of the neighbouring Czech, Slovak and Polish electric power systems also announced their intention to join the UCPTE. In UCPTE's earlier practice the preparation of the feasibility study had been taken by the neighbouring countries relating always a *single candidate*. Beginning in 1992, however, UCPTE changed its procedure and is now managing the joining of all the four countries. So in that respect the Visegrád cooperation actually came alive in the framework of CENTREL: the cooperation of the Hungarian, Slovakian, Czech, and Polish electric power systems. The four systems have to form a four-sided autonomous operation splitting off from the Ukrainian system. The main objective is to prove their independent operating and controlling capabilities. On the one hand, this is a constraint in the sense that Russia, which formerly carried out adjustments

across the whole CDU network has declined to continue doing so. It is sensible on the other hand, as UCTPE does not undertake this obligation either, because it sets the proof of the independent working abilities as a condition for joining. (By the way, satisfying this condition is *easier* than the condition whereby the four countries should prove their ability to work separately from each other.) The systems test had already been started in 1993 (29-30th of September). As a result of the adverse energy situation within the CIS, the test run had to be prolonged and thus CENTREL functioned as a separate system.

Figure 3

The Outlines of a Connected Electricity System after 2000



Source: Kreusel

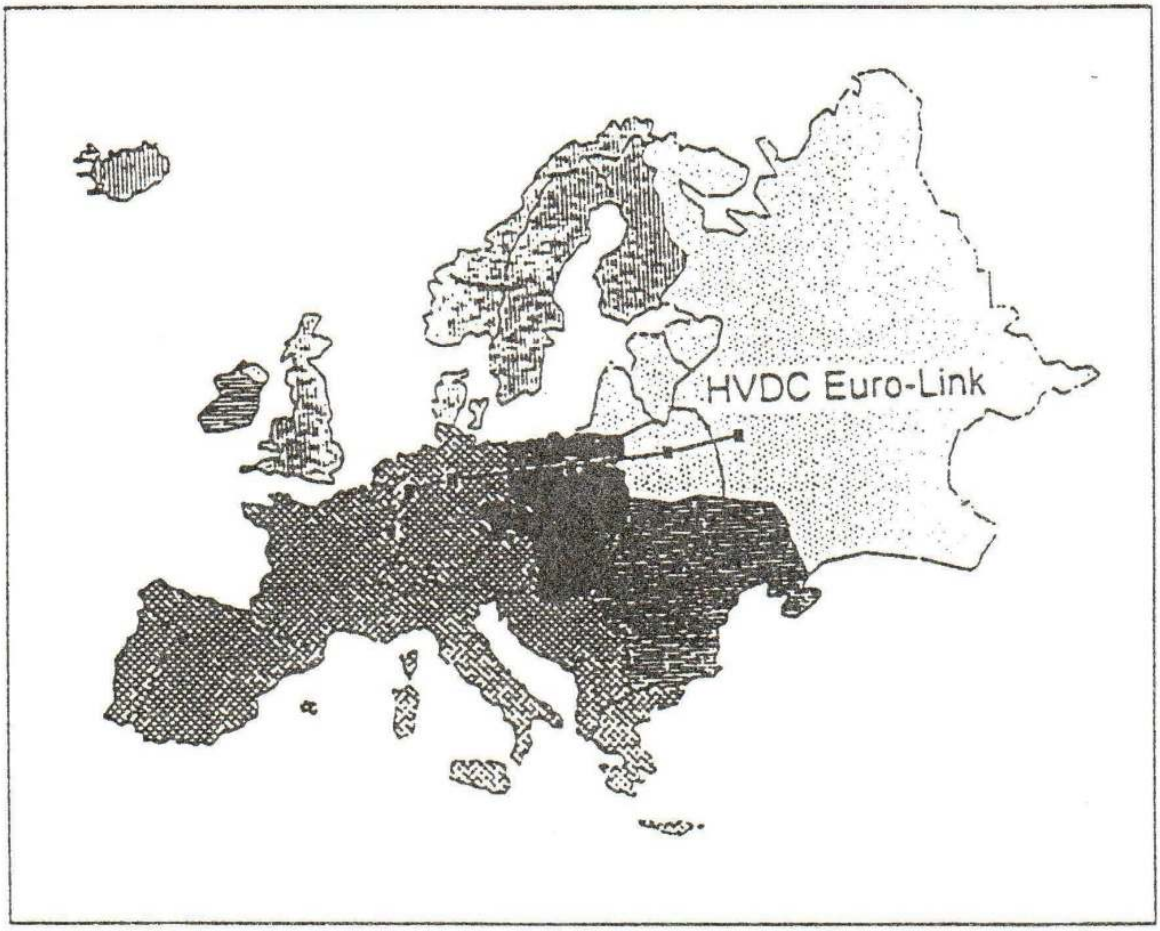
There are *technical, efficiency, security and political considerations* involved in the feasible future trends relative to large electricity systems. From a purely technical perspective, large, centralised networks are feasible and they have efficiency gains (individual countries need less reserve capacities). This idea would be in line even with the Maastricht spirit. It is undeniable at the same time that the growth of benefits decelerates beyond a certain network size, and if economies with precarious stability are included, this risk increases.

Consequently, the Aachen RWTH[12] suggests a trans-European electricity system extending up to the Urals characterized by a network of medium-sized units (*Figure 3*). Individual units to be linked would be the size of the Iberian peninsula, France, Germany, or the four-country network of CENTREL. The project divides the European part of the CIS into four similar size units.

This idea is in line with the *distributive* conception of networks already mentioned which would link larger self-sufficient regions. At the same time, the conception requires as a condition the existence of such large, balanced regions. If somewhere this condition is missing, the import expected from a distance becomes insecure. Therefore the Aachen institute supplemented its conception to a so-called hybrid solution. In order for Western-Europe to have a secured electricity import from Russia (the Smolensk-region) a separate, direct-current link should be established between the two endpoints (*Figure 4*) spanning the deficient Ukrainan region. Even more is revealed from the nature of such magistral elements by the suggestion of adding to the electricity generating capacity of Western-Europe a 10 or possibly 20 GW unit fed by Kongo precipices.[13]

Figure 4

Hybrid Connection in the European Electricity System: High Voltage Direct Current Euro-link



Source: Kreusel

4.4. Summary: Tendencies in the Development of European Networks

Let us return to *Figure 1* where we distinguished three different types of traffic relative to a narrow region: *transit* which is just going through the region, *external link* providing for traffic into and out of the region and *region intern* provision.

These types of links have a historical order. In the case of public roads sideways inherited the network of roadways linking villages. This was enhanced in the first half of this century by highways linking major cities and

intended already for passenger cars. Finally, in the second half of the century, speedways appeared which bypass cities and link economic regions.

In the case of gas networks there have been city networks since the turn of the century and regional pipelines since the thirties. In smaller countries this regional network becomes international in the sixties and in the seventies magistral networks appear.

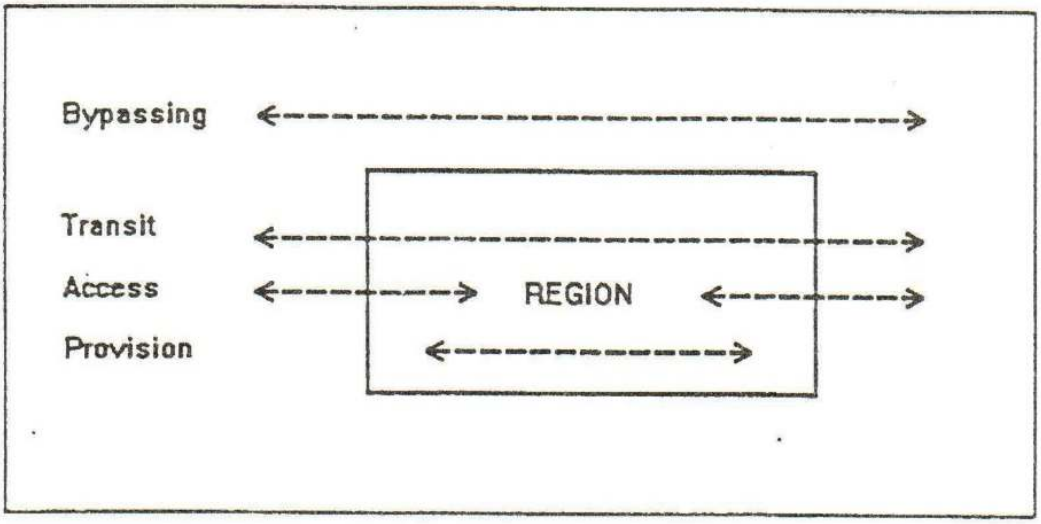
Parallel to this were the development of electricity networks. According to the German development, electricity generated for the household appeared at the turn of the century and city-wide networks came with World War I. From the thirties we find links between settlements, and from the fifties, large, connected electricity systems. Let us mention that this was a link between distributive systems. Magistral lines were developed gradually in the following decades.

In Hungary, the first public use city electricity generators were established in the 1880s (Temesvár 1884, and Mátészalka on the country's present territory in 1888). In Budapest electricity supply began in 1893. In the 1930s power plants were still isolated and supplied smaller regions with electricity without cooperating. The first long-distance transmission line was established in 1929 and was used for railway electrification between Bánhida and Budapest. Gradually a unified national network did emerge and by 1963 the supply of Hungarian settlements with electricity became universal[14]. The internationalisation of the network was started in 1952, with a link between the Hungarian and the Czechoslovak network. This was followed in 1958 by a link with Yugoslavia and in 1962 by the first Soviet-Hungarian long distance transmission line. In 1963 the Hungarian electricity system was attached to the unified system of the CMEA. Beyond that, since 1968 there has been a mutually advantageous, regular exchange of electricity between Hungary and Austria.

With all these networks it has been a development of the last decades that large-capacity, magistral network components did appear serving not regional, but interregional circulation. Their transit character is not accidental (the traveller either stops or proceeds on his way) but a built-in technological parameter. And there is often such a huge difference in economic development levels between the end-points that the presence of the magistral lines certainly means quite different things for one end and the other. In the case of transport we stressed the importance of local receptivity. In the case of the gas pipeline we mentioned, it might be not by chance that the pipeline arriving from Algeria through South-Italy and that from the Soviet Union through Eastern-Europe are of magistral type. In the case of electricity networks, it has quite a symbolic meaning that proposed transmission lines both from Russia and Kongo are for direct current.

Figure 5

Transport Links Relative to a Region



Source: After Plogmann with own supplements

If we return to *Figure 1* with its *transit, accessing and internal traffic* it is striking that we left out a "link" whose importance is growing, namely the "transit" which *does not even cross* the border of the region, but rather bypassing traffic (*Figure 5*).

Nowadays regions at different levels of development increasingly have to suffer transit totally alien to them, with no benefits, only costs. Increasingly it is thus argued that such kinds of lines (ways) mean the export of *contamination* with mainly non-monetary costs. Even the monetary part of the costs are not offering to these regions benefit accruing at points of access.

5. ECONOMIC, REGIONAL, ENVIRONMENTAL AND SOCIAL IMPACTS OF INFRASTRUCTURE NETWORKS

5.1. Non-spatial Impacts

As we have seen earlier foreign literature divides the impact of infrastructure into *spatial/non-spatial* (this is more or less equivalent to our *vectorial/scalar* differentiation). If we want to go further into the details of such impacts we have to include among spatial impacts the bulk of the impact on the environment, on the regional economy and on local politics, whereas the *non-spatial* group embraces mainly macroeconomic elements (regionally integrated economic indicators, competitivity, productivity, employment etc.).

We could observe that when speaking about *infrastructure-oriented economic policy and development strategy,* then arguments for concentrate on macroeconomic factors. This is natural since what concerns the aims we are speaking about *economic policy*, which is a macroeconomic category. It would be one-sided however to exclude thereby an inadmissibly large part of the effects related to infrastructure the driving force behind processes.

The most frequently used arguments for infrastructure development are the following:

* Faulty infrastructure is an obstacle to production/services; therefore, to do away with shortages, it is indispensable for economic growth.
* Infrastructure development is not import-intensive which is favourable for the domestic economy and the trade account.
* The development and operation of infrastructure is labour-intensive which is favourable for employment.
* Infrastructure development releases high demand within the production sphere, favouring certain subcontractors and thereby starts a boom of the economy.

One cannot say *in general* that these statements are true or wrong. Under Keynesian economic policy it is true that *any* state investment, be it military preparations, the building of a government residential district or jails has similar trickle-down economic impacts but this does not make the above goals appealing. One cannot spare to make a similar evaluating distinction within infrastructure and weigh the actual impact of individual objects.

In the case of certain infrastructure types the above mentioned policy goals do not come through at all. The largest investments, due to their high technology level employ *little labour,* they are *capital- and import-intensive,* and their trickle-down *effect shows up abroad* (cases of metro-, high speed train-, nuclear power plant-, highway constructions, telephone exchanges). Some are *nevertheless* needed, but we should not mix their support with inappropriate general arguments.

Naturally, with any investment, as is the case with capital-intensive infrastructural investments, *there are* interest groups, sometimes whole industries, who are interested in the realisation of these establishments. These groups try to involve state resources, by acquiring state guarantees. This would be made easier by laying down the general principle that infrastructural investments *in general* are preferred. But there is *no* such principle. On the contrary, *there are* infrastructural establishments which are

outright harmful, whose establishment should be explicitly opposed or delayed by central and local government. Matter of fact evaluation and decision making cannot be replaced by general principles precisely in the case of the largest investments.

5.2. Spatial Impacts

From among the spatial factors the general pro-infrastructure argument singles out and generalises one, namely the goal of *becoming a regional center*.

In this century Budapest and the country were not very often an appealing target but in the eighties this changed. This happened not because it became a high priority goal to become a regional center. Quite the contrary, at the time the country followed a comparatively liberal, market-oriented and dissident path relative to its environment. It was simply the change in local circumstances that made it attractive. This came about as a *result* of an in-country regulation a region was defined whose center, one can say, was Budapest.

In the politics of the nineties, priorities were reversed. Budapest and its antagonists alike would all like *to have a central role* and seek the outside preconditions of this role including infrastructure, Western aid, investment and capital. The physical content does not matter, rather what matters is that it should come "to us" not to another capital (or district on a local level). The abstract idea of "regional center" is as *inhuman* as are the industrialised magistral networks. We have not realised up to now that to build world trade centers in a residential district is as devastating as to run a highway or a pipeline through the apartment houses. The residents are under increasing pressure in both cases, and it turns out sooner or later that they are - together with their apartment - just a troubling factor in a larger game.

What concerns infrastructural networks in *Chapter 4* we reviewed the impact of distributive and magistral networks, the role of their "developed" and "underdeveloped" end upon

spatial development. The geography of transport gives an even more comprehensive classification for transport networks that is worth looking over.

When dealing with the regional impact of transport infrastructure we have to distinguish first between two types of *transport methods*: *open sections* which have first of all a negative impact on the region concerned whereas positive regional impact may emerge on *points of access*. There was a gradual, historic shift from *everywhere accessible* transport ways towards transport ways having sparsely scattered but *concentrated crosspoints*.

Crosspoints are classified by the geography of transport into *primary, secondary* and *tertiary*. *Primary* are the points whose importance is determined by their *geographic location* (gate, cape, col). Crosspoints where transport flows meet are *secondary,* whereas *crosspoints* created by the *operative functions* of transportation belong to the *tertiary* group. Nowadays both the magistral ways of transportation and the crosspoints created by them increasingly have an industrial/mass-production character and accordingly are separated from the areas for everyday life (housing, recreation, shopping, education, leisure etc).

Traditional communication relates from a *functional point of view* in three ways to a given area: it either *reveals* the area from inside (*provision*), *collects* transport heading towards it (*access*) or *passes through* a region (*transit*). Lately in the relationship of busy ways and locality a fourth function has emerged, namely that the transit flows have *no direct contact* with the area (*bypassing*). We have no "hard" statistical data for the evaluation of the degree of *bypassing* but we have to call the attention to the fact that in the evaluation of regional development *environmental factors* have an increasing role and in this respect it is not the *larger* traffic but the smaller one that is preferable.

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