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POWER INDUSTRY IN ALBANIA AND ITS WAY THROUGH THE REFORM TO MARKET ECONOMIES

Edmond LEKA

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"POWER INDUSTRY IN ALBANIA AND ITS WAY THROUGH THE REFORM TO MARKET ECONOMIES "

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Acknowledgments

I would take the chance to thank all the people that helped me with their comments and discussions. I would mention here Mr. M.Toto from the A.E.C., G.Daci form the Power Institute attached to the A.E.C., E.Brahja (IHS) and many others.

I would like to thank specially here **Professor Todor Balabanov** for the very useful rewievs and comments and for the very generous attention dedicated to my work.

The "Institute for Advanced Studies" in Vienna, and to the EFTA organization for the financial support given for following the program in "Applied economics" and the realization of this study.

Abstract

Albania is one of the Eastern European countries that has done some radical changes, in their way through the reform, toward market economies. Many branches of the economy are involved in the processes of privatization, restructuring and deregulation. The reform, sooner or latter, will go through the power industry also, and this is one of the relatively developed branches of the Albanian industry.

The aim of these study is to give a presentation of the power industry in Albania, an approximation of the cost formation structure in this particular industry and some possible forms for its restructuring, taking in consideration the recent western and eastern experiences in this field.

It aims to contribute modestly in the debate on the possible different forms of organization of Albanian power industry trying to explain their advantages and disadvantages when applied to the Albanian reality.

CONTENTS

INTRODUCTION

Recent economic developments in ALBANIA.

In the transition period Albania faced a very sharp recession due to the collapse of the system of socialist economy which in itself was accelerated by internal social factors. The fact that Albania was the last from the east European countries breaking with the socialist ideology and that was from these countries the one who went further in realizing the socialist form of economy also contributed in worsening the situation.
Other factors such as isolation from the rest of the world and the cruelty of the former regime deteriorated the situation in the sense that the contributed to make it more difficult than for other East European countries to take the way of reforms.
However, in recent months, industrial production in the state owned enterprises slowly begun to increase, specially in petroleum, cooper, electricity, plastics, chromium, fertilizers and textiles. This follows a contraction on the industrial output of nearly 50% during 1991 and 1992.
Thanks to a sharp tightening of the fiscal and monetary policy the inflation seems to have slowed down. Monthly inflation rate fell from 6.8% in January(when further administrative price and wages took place) to 0.9% in March. The official target of 3.2 % per month (45 % per year) seems to be within reach.
The exchange rate vis-à-vis the USD has decreased from 115 Lek/USD in February to 108 Lek/USD in May, and even lower in the following months stabilizing at a value of 100Lek/USD from July until recent days.
Privatization has been comprehensive in the retail sector, in the small-scale services and in transport(on road transport, ferry transport). The most common form of privatization has been the employee buy-out.
The privatization of the medium and large scale enterprises has been sluggish, mostly because of the limited buyer interest and inconsistencies of the legal system with restitution (which has lead to conflicting claims on property).

MAIN INDICATORS OF THE ALBANIAN ECONOMY IN THE TRANSITION PERIOD

	1989	1990	1991	1992	1993*
G.D.P.(1989 taken as base year)	100%	90%	67%	62%	64%
Change in G.D.P. in comfront to the previous year	0%	-10%	-28%	-8%	4%
Industrial production (1989 taken as base)	100%	80%	50%	n.a.	n.a.
Change in the industrial production	0%	-19%	-42%	n.a.	n.a.
Inflation rate (in annual base)	0%	0%	115%	236%	24%
Imports (Mio of USD)	483,6	485,1	314	644	n.a.
Exports (MIO of USD)	419	317	82,3	75,5	n.a.
External debt (MIO of USD)	0	0	498	610	745

* - for 1993 there are estimations.

TABLE 1

PART I

PRESENTATION OF THE POWER INDUSTRY.

GENERATION

Power industry in Albania is relatively developed as compared to the other branches of the industry. Considerable amounts of capital were invested in the industry by the former communist governments because the fulfillment of the needs for electricity was seen as a basic for the realization of their dream of a self-sufficient economy. Due to such investments in power plants especially in Hydro-projects from the 70-es, now Albania faces a excess capacity, which has contributed to the considerable exports of electricity in neighboring countries.
The power industry is organized in the form of a public monopoly, namely Albanian Electro-energetic Corporation (A.E.C.),which comprises the entire cycle from the producer to the end use consumer.
Under the production branch of the A.E.C. there are 13 plants , hydro or thermo plants as is described in the Table 2, below, each of these plants is organized as a production entity and has in administration the high voltage network situated within its area of competence.
The A.E.C. thermo-capacities also produce steam as could be seen in the table below. In some cases the production and sale of steam is the only activity to which plants are engaged.

DATA ON THE PRODUCTION UNITS (1992)						
Name of the Plant	FUEL USED	INSTALLED CAPACITY UNITS	MW	PROD ELECTRICITY GWh	STEAM 1000 T	STAFF* NUMBER
FIERZA	*hydro*	4	500	923,5	-	245
KOMAN	*hydro*	4	600	1386	-	155
VAU-DEJES	*hydro*	5	250	678	-	265
ULEZ	*hydro*	6	49,2	108,8	-	300
BISTRICE	*hydro*	4	27,5	130,5	-	150
total HYDRO		*23*	*1426,7*	*3226,8*	-	*1115*
TIRANA	*coal*	2	4,9	0	62,9	580
KORCA	*coal*	4	13	8,6	69,6	530
CERRIK	*oil*	3	8,5	0	1,8	320
KUCOVE	*oil*	2	5,6	0	42,1	185
FIER	*oil/gas*	6	159	70,9	244	615
BALLSH	*oil/gas*	2	24	50,3	431,3	260
VLORE	*oil*	2	3	0	0	265
total THERMO		*21*	*218*	*129,8*	*851,7*	*2755*
TOTAL		**44**	**1644,7**	**3356,6**	**851,7**	**3870**
* In the staff number is included the personel dedicated to the maintenance of the high-voltage grid which isw based in the production units.						

TAB 2

Concerning the type power production, we could say that the Albanian power industry is basically hydro-power oriented , in fact 95 % of the electricity generation came from the hydro-power sources and only 5% from the thermo-power capacities(1992). In terms of installed capacity the figures differ slightly, but the sense remains the same. Hydro capacities are 86,6 % of the total installed capacity.

The thermal-power capacity is for its 90 % comprises oil or gas fueled plants, the remaining 10% is using relatively low-calorific local lignite.
Given the fact that is a hydro oriented power-production(in 1992 the share of hydro-generated electricity was of 95%), the yearly production will depend on the precipitation level and hydro reserves that vary every year.
The yearly production of hydro-power plants varies from 3.500 GWh (90% of probability; the probabilities are calculated respect to the average hydrological year) to 4.800 GWh (50% probability) up to 7.000 GWh(25% of probability).
The maximum of output of the power system has been registered in the 1986, when 5027 GWh were produced.

HYDRO-POWER GENERATION.

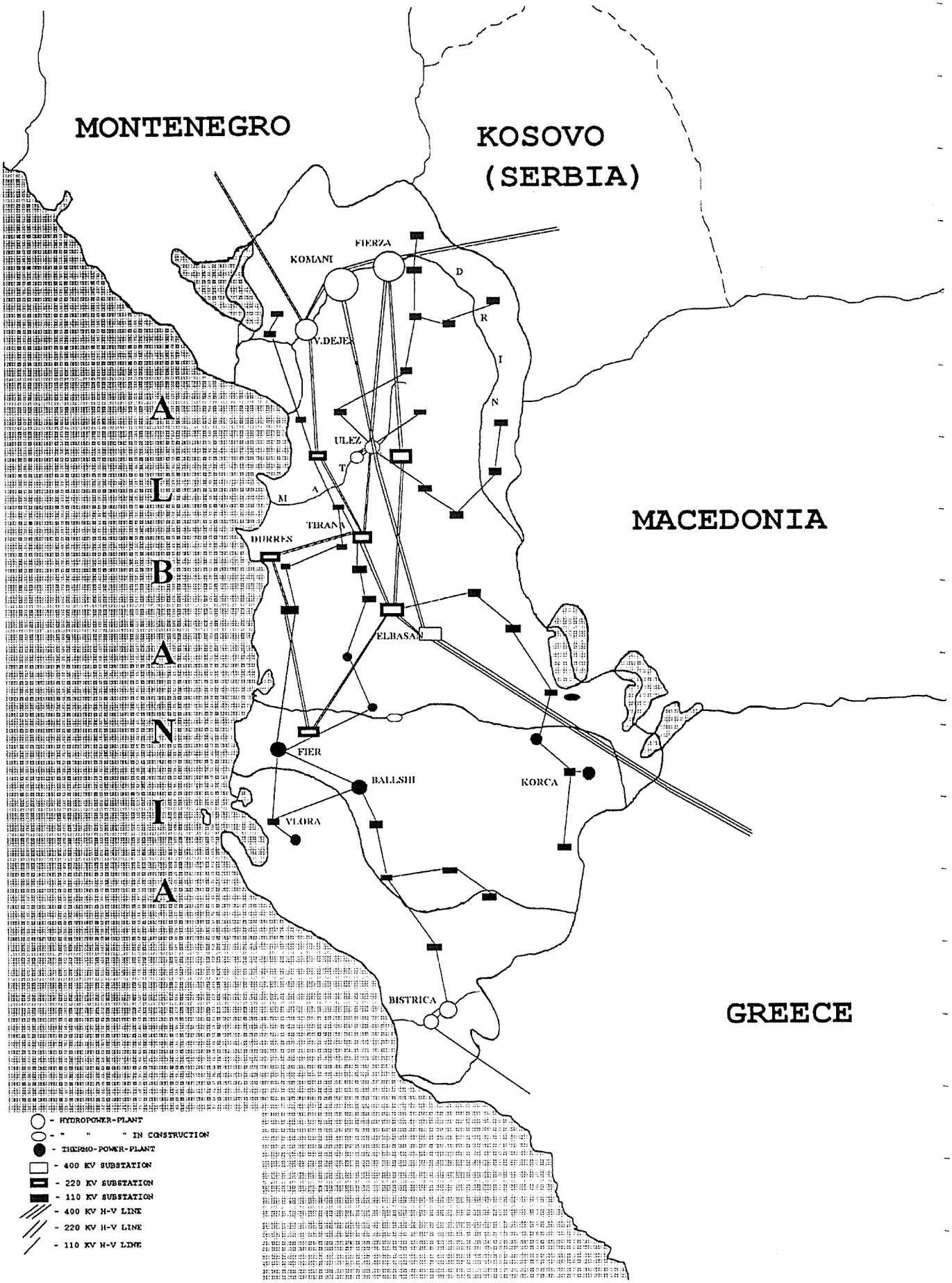
The hydro-power capacities consist in three main hydro-power cascades.

The first cascade and the biggest of the three, is built on the river DRIN in the northern part of the country (You can reefer to the map included in the Appendix).
It consists in three power-plants namely
Fierza situated in the upper stream of the river with a lake capacity of 3 x 10^9 m^3 ,installed capacity of 500 MW ,in operation since 1978, built with Chinese supplied technology. Considering its big lake capacity it also **regulates** the flow to the other power-plants in the river.
Komani, is the second plant in the cascade with a lake capacity of only 300 x 10^6 m^3, installed capacity of 600 MW, in operation from 1986, built under French supervision and with a French supplied technology.
Vau-Dejes, the third and the last one has a lake with 250 x 10^6 m^3, an installed power of 250 MW, in operation from 1969 and built under Chinese supervision with a Chinese supplied technology.

The second cascade, built on the river MAT in central Albania, consists in two plants, namely
Ulez, the first plant in the cascade, in operation from 1965, with a lake of 150 x 10^6 m3 and installed power of 24 MW built with Check supplied technology.
Shkopet the second plant with a installed power of 25,2 MW, in operation from 1965 also built with Check supplied technology.

The third cascade, built in the river with the same name situated in the extreme south of the country, consists also in two plants:
Bistrica I & II in operation from 1967 with a total installed capacity of 27,5 MW, built with a Check supplied technology.

In addition to the above mentioned, there are some other small hydro-plants of local importance which are not connected with the high voltage network (110 KV and upward), but serve the local networks. Their total installed power is 14 MW and their annual power production in 1992 was about 55 MWh.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V.DEJES
ULEZ
TIRANA
DURRES
ELBASAN
FIER
BALLSHI
VLORA
KORCA
BISTRICA
- HYDROPOWER-PLANT
- " " " IN CONSTRUCTION
- THERMO-POWER-PLANT
- 400 KV SUBSTATION
- 220 KV SUBSTATION
- 110 KV SUBSTATION
- 400 KV H-V LINE
- 220 KV H-V LINE
- 110 KV H-V LINE

THERMO-POWER GENERATION.

Most of the thermo-power plants are old and with low efficiencies. Exception can be made for three relatively newly build units.
The new aggregate installed in the old Fieri Thermo-Power Plant (60MW, Czech supplied technology, in operation since 1980, oil/gas plant).
The newly built thermo-power plant [Fier-5(the fifth unit in the thermo-power plant of Fieri), 60MW, 1980, oil-gas, Czech technology, and Ballsh 24MW, Chinese supplied technology, in operation since 1980, oil/gas plant). These are considered to be more efficient.

The other thermo generators, which compose the A.E.C. thermo capacity are oil or coal fueled, but due to the relatively high cost of production per KWh power output, they are rarely used for power production.
The daily thermo load curve of the power plants is determined by the need for steam of the nearby industries, and since the steam consumers.
In general we can say that the production of the power from the thermo-power plants, due to relatively high cost of production, is only complementary to the hydro-power generation or as a by-product in the case the thermo-power plant is supplying also steam to its consumers.

TRANSMISSION

The electric transmission network grid covers all the territory of the country and provides for the connection of the Albanian power system to the systems of the neighboring countries, as can be seen in the map showing the Albanian power high voltage grid and the location of the plants.
The high voltage network in Albania consists of 35 KV, 110 KV, 220 KV and 400 KV lines.
While the Grid management is centralized in Tirana, its maintenance operations are performed by units specialized in grid maintenance that are based in the nearby production entities. These units also depend administratively from the production entities in which are based.
Its composition for different voltages could be seen in the table below.

TECHNICAL PARAMETERS OF THE HIGH VOLTAGE TRANSMISSION NETWORK GRID					
	Instaled transf.cap.*	Length of transmission lines (km)			
Name of the entity	*MVA*	*35 KV*	*110 KV*	*220 KV*	*400 KV*
FIERZE	688,4	51,5	116,5	150,8	-
KOMAN	707,2	33	-	78,5	-
VAU-DEJES	437,6	100	74	196,5	-
ULEZ	277,9	62,4	170,3	69,6	-
BISTRICE	161,3	136,2	152,7	0	-
TIRANE	521,8	197,1	229,6	415,1	-
KORCE	91,1	122,2	97,3	-	61,8
CERRIK	923,6	84,5	119,4	109,1	58,4
KUCOVE	101,8	95,5	39,1	-	-
FIER	508,3	195,1	133	79,4	-
BALLSH	58	24,1	38,7	-	-
VLORE	167,3	152,6	41,2	-	-
TOTAL	*4644,3*	*1254,2*	*1095,3*	*1099*	*120,2*
* - Instaled transformer capacity in grid substations					

TABLE 3

The total power of the transformers installed in the national transmission grid is 4645 MVA , of which 755 MVA in 35 KV voltage, 1200 MVA in the 110 KV voltage, 2390 MVA on the 220 KV and 300 MVA on the 400KV voltage.

Total number of the grid substations is 185 , and the number of the transformers operating in the high voltage system is 368.

IMPORT-EXPORT TRANSMISSION LINES

At the present there are four high voltage lines connecting the Albanian power system to the neighboring countries, and their characteristics are shown in the Table below.

IMPORT - EXPORT TRANSMISSION LINES						
COUNTRY	A.C. LINE CARACTERISTICS					
	400 KV		220KV		150KV	
	Line capacity MW	TR. capacity * MVA	Line capacity MW	TR. capacity * MVA	Line capacity MW	TR. capacity * MVA
GREECE	1200	300	-	-	100	60
MONTENEGRO	-	-	300	NETWORK		
SERBIA (KOSOVO)			300	NETWORK		
* - TRANSFORMER CAPACITY						

TABLE 4

The total export instantaneous capability, as can be seen from the Table is about 950 MW.

This technical parameter is very important because creates the possibility a combination of the internal demand with exports, permitting this way a better use of the natural recourses during the winter and spring peak periods when sometimes the lake availability is insufficient to provide a regulation of the flows of the river.

DISTRIBUTION

Urban and rural distribution AC network laid at 0.4 KV is with a total length of 31200 km, on the AC voltage 6KV the length is of 6120 km and on 10 KV AC voltage the length of lines is 6450 km.

In the main towns the investments in distribution network started in a new distribution network level of 20 kV. This network will run in parallel to the existing one and only in a successive phase will replace it completely.
The installed power of the transformers in the distribution network
in the voltage 6 KV is 550 MVA.
All the distribution network and facilities are run by the regional distribution companies. There are 33 of them operating in different regions of the country. There are of different sizes as for the parts of the grid they run and number of end use consumers they serve, ranging from a minimum of 7822 end use consumers of the distribution company of GRAMSHI to a maximum of 78600 end use consumers of the TIRANA CITY distribution company.
As can be seen in the TABLE 5 in the Appendix the distribution of the power consumption is not uniform in the whole country. It is concentrated in some areas as WEST CENTRAL or SOUTH WEST where most of the industry is concentrated and the consumption per domestic consumer is higher as confronted with other parts of the country. An other fact which could be considered easily is the correlation which exists between the data on consumption and the data on the distribution losses or the unregistered (or stolen) consumption.
The geographical terms used above should be intended as such because the 33 distribution companies are not involved in any kind of regional dependence. They depend only to the directorate of distribution of the A.E.C.
Some parameters for the distribution network are given in the table below.

TECHNICAL PARAMETERS OF THE DISTRIBUTION SIDE					
Number of distribution entities	*Number of consumers*			*Average domestic consumer demand*	*Total number of staff in distribution*
	Domestic	*Non - dom*	*Total*		
33	638,521	32,543	671,064	1331	5090

TABLE 5

The service they offer at this moment is very poor. Interruptions and bad quality of the product(low voltage)are frequent experiences for the domestic consumers.
The two most important problems the distribution entities face actually are
1. Collecting the payments for the energy billed (this phenomena is mainly to be connected to the recession which the Albanian economy is crossing, many from the large industrial consumers of the electricity do not have liquidity to pay for the power consumption, that is the case for more than 85% of the arrears from the consumers payments of the A.E.C.)
2. The phenomena of Non-technical losses or the unregistered electricity consummation.
The first problem seems to be under control, because actually A.E.C. is given by the government the right to disconnect the consumers that do not keep paying within the limits included in the contract for supply with electricity.
The second problem that of the technical losses is not so easy to be resolved because of the need of consistent amounts of investments needed especially in the distribution networks and in the installation of metering devices.
A breakdown of the electricity balance is given by the table below.

ELECTRICITY BALANCE FOR THE DISTRIBUTION COMPANIES (1992)						
Supplied to the distr. network	*Sold (Billed) to consumers(in GWh)*			*Average consumption./dom. consumer*		*Distribution losses*
	Domestic	*Non-domestic*	*Total sold*	*Supplied(kWh)*	*Billed(kWh)*	*%*
2128,9	*479,2*	*880,2*	*1359,4*	*1331*	*750*	*36,10%*

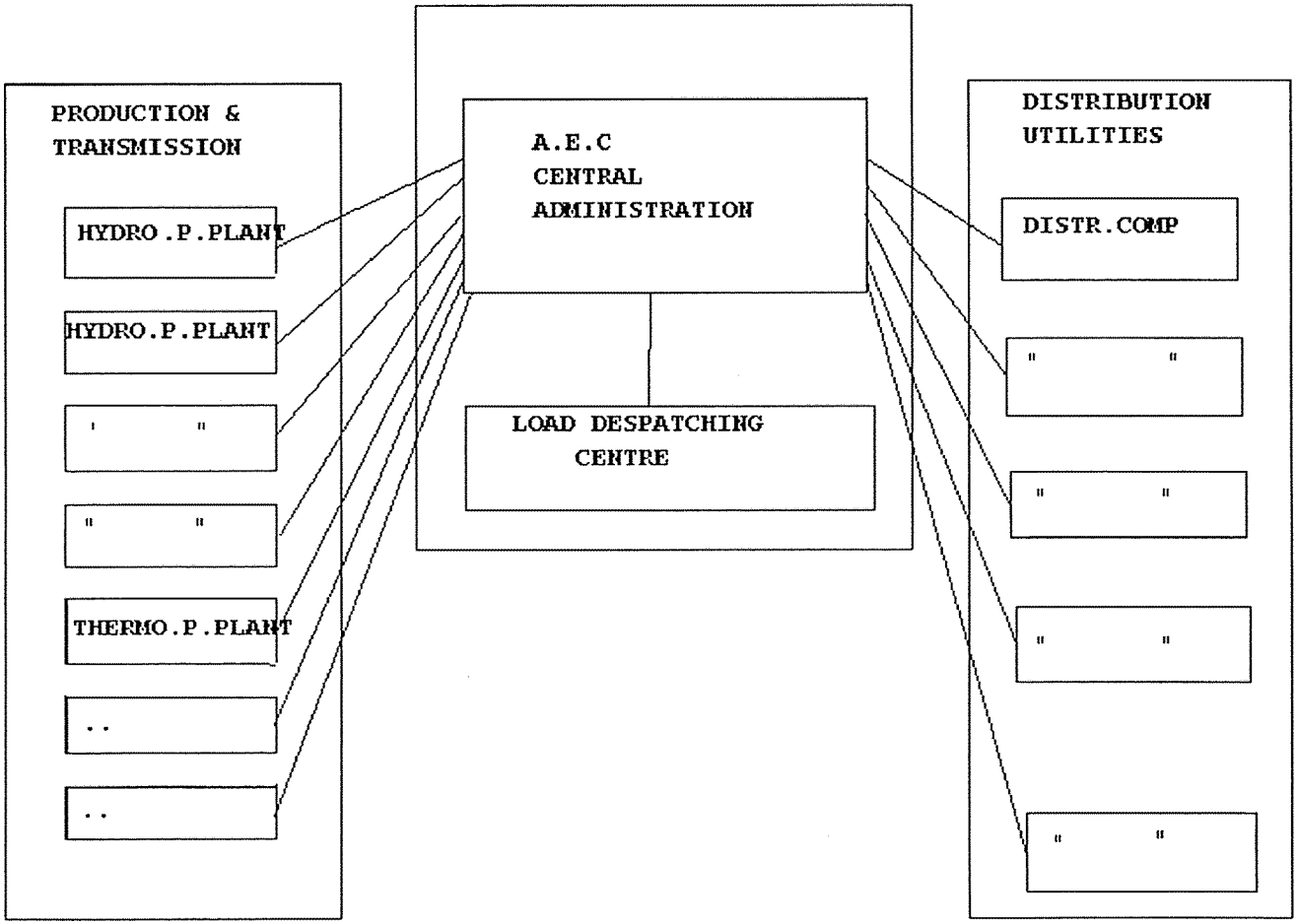
TABLE 6

The figure of distribution losses is evaluated to be composed by 50% each by technical and technical losses. The estimation for 1993 bring this figure to about 40 % and the percentage of the non-technical losses to around 20%, of the total electricity supplied to the distribution network.
The increase of the power consumption in the residential areas, due to the import and increased use in the domestic life of electro-devices and installation of various small services and small scale industrial consumers in the distribution AC network, will create other problems to the even now charged distribution network in these areas.

The A.E.C. plans to invest heavily in distribution, mainly to realizethe following two goals :
I - the upgrading of the distribution network (fitting it to the new consumer structure and size)
II - to bring the figure of non-technical losses (non-registered consumption) from about 20% in 1993 to the figure of 10% for 1998. This would require a lot of investment specially in metering devices and in switching and commuting materials.

THE PRESENT STATUS AND STRUCTURE OF THE POWER SECTOR IN ALBANIA

As it has been mentioned above the production and sale of the electric power in Albania is a monopoly of the state owned company **Albanian Electroenergetic Corporation**. They are the only company to have a license for production, transmission, distribution, sale and import/ export of the electric power.
A.E.C. is a "state enterprise" under the Ministry of Industry, Mineral Resources and Energy, established in 1992 in accordance with the Law on State Enterprises dated 13.7.1992.
The principal objectives for the power supply industry, as stated in the Act of establishment of the company, are :
-to provide continued , sufficient and reliable supply of electricity for all sectors of the economy and all areas of the country , and in line with the requirements of the protection of the environment.
- to produce and supply electricity efficiently and at equitable prices to all the categories of consumers.
-to provide for adequate rehabilitation and maintenance of all plants and for the expansion and development of the power system in line with the growing demand.
- to generate and secure the necessary founds to finance the planned developments of the electricity supply sector.
The present control and regulation exercised by the government is quite considerable and the autonomy of the A.E.C. in many respects is limited.
The State of Albania is the sole owner of the A.E.C.. The capital (property)of the A.E.C. comprises that of all entities and institutions which are part of the A.E.C..



ADMINISTRATIVE DEPENDANCE

The company is not incorporated as a joint stock company. However, the law of the state entities provides for the transformation of a state owned company into a joint-stock company in accordance with the existing laws.
A.E.C. has a full financial responsibility (budget and financial planning, annual accounts). Budget and annual accounts are approved by the Board of A.E.C. and then must be submitted to the government for inspection.
A.E.C. is authorized to borrow money on the national and international market.
Actually under the present economic situation the A.E.C. is not engaged in any borrowing, but for the future plans to make use of the domestic and international financial markets to finance the investments in various fields of the power industry.
Capital development expenditure has been funded since now essentially by the following three sources :

1. Funding out of profit.
2. Allocations out of the State Budget.
3. Foreign grants.

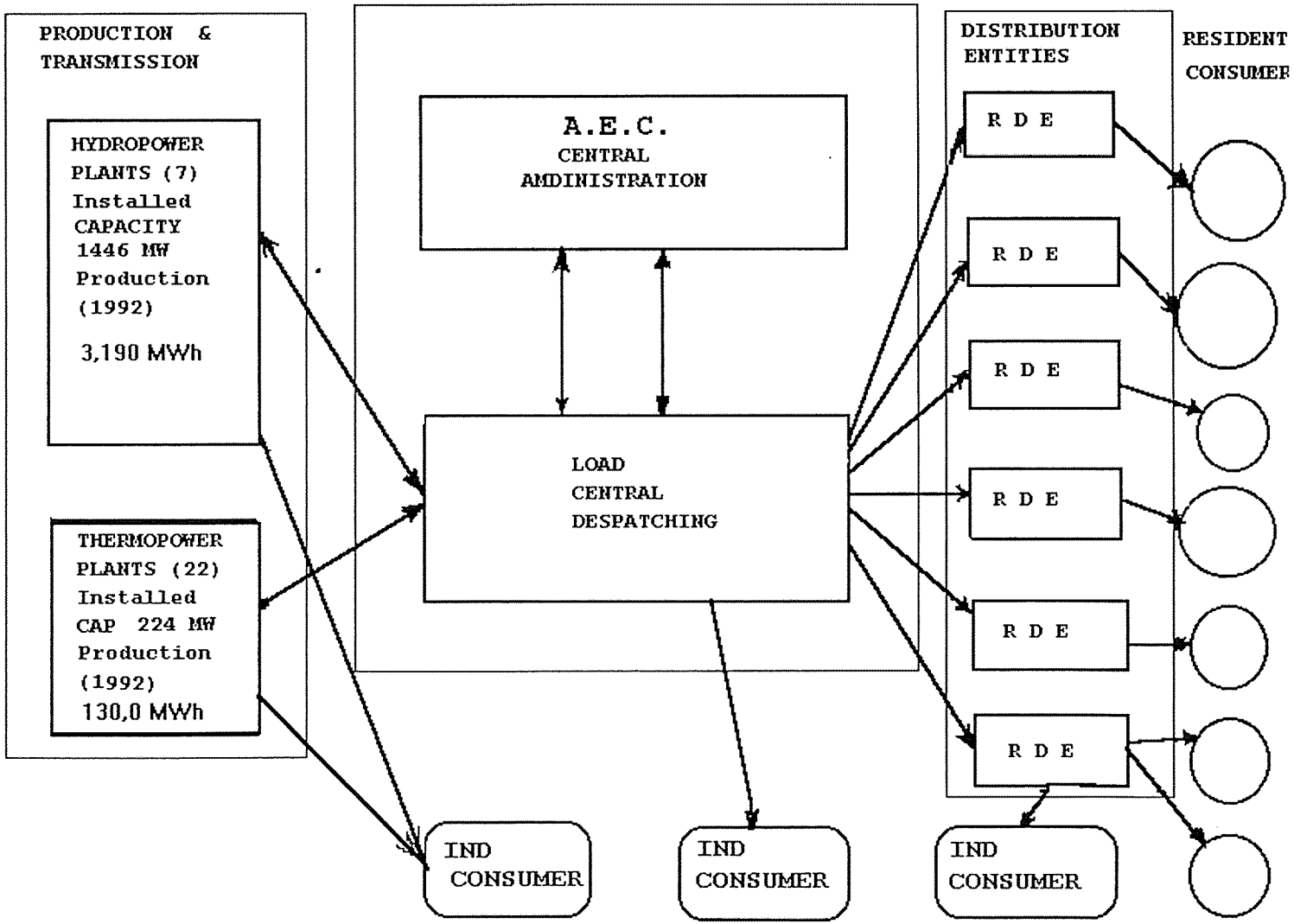
The funding from the State budged implies of course a considerable degree of dependence from the government.
The profit of the A.E.C. remains in the enterprise, subject of certain regulations regarding appropriation to different funds.

As for the internal organization, in the A.E.C are incorporated 47 "enterprises", from which 13 are "production & transmission" ones, 33 "distribution enterprises" and 6 "enterprises" which are engaged in procurement of materials.
The A.E.C. incorporates also the "Institute of Power Research".
In 1993 the total number of employees was 9500.

Production and transmission entities

The "production and transmission entities" are acting in fact as "separate" administrative units but under the authority of the A.E.C.'s Directorate of Production and Transmission.
The "production & transmission entities" "sell" the total of their energy production to the A.E.C.; on the other hand they "buy" back the from the A.E.C. the electricity which they need for direct sale at high voltage level to large industrial consumers and for resale to the distribution entities.
In import-export activities the A.E.C. acts directly without the mediation of "production & transmission entities".
In the A.E.C. headquarters is incorporated the dispatching center which has the following functions:
- is in charge with the management of the high voltage network grid
- is responsible for the load management
- for the load distribution between the various producers and in organizing the program for the maintenance operations to be carried out in various period of the year on the generating facilities and the high voltage grid.

This dispatching center is supported by a studying group which studies the optimal regime to be followed, given the levels of water in various reservoirs of the various Hydro-Power-Plants and the aggregate demand for electricity, including domestic power demand and import-export contracts.
As already mentioned before it doesn't exist separate entity to administer, run and maintain the high voltage grid separately.



OPERATIONAL DEPENDENCE

Each "administrative unit" administers, runs and is responsible for the maintenance of the high voltage substations and transmission lines situated within its area of competence.

The distribution entities.

Until 1991 the "distribution company[1]" were completely separate state entities under different Ministry, buying electricity from the A.E.C. for retail sale in their respective supply areas.
Their responsibilities included the development, operation and maintenance of the 6kV and 10 kV medium voltage grids and local low voltage networks, and supply of electricity to consumers.
With the reorganization of the power industry in 1991 the "distribution company" were brought under the responsibility of A.E.C. However the "distribution companies" are not merely departments under the A.E.C.'s Directorate for Distribution, but remain in fact fairly independent administrative units.
The "distribution company" still formally "buy" electricity from the A.E.C. (actually from the "production & transmission" administrative units), and have their own full financial accounts with an annual balance sheet and showing an annual profit.
They have also their own executive council(management).
On the other hand they use the services of a number of central units of A.E.C. such as workshops, central store, planning department, administration etc.
The distribution companies are funded by the A.E.C. in respect of their investment requirements.

[1] we will call the distribution enterprises "distribution company"

PART II

ECONOMIC PERFORMANCE OF THE A.E.C.

As we can check from the table showing the balance sheets of the A.E.C. in the Appendix, the company is showing a profit in the two years we are observing. The **rate of return on the assets is 21,4 %** for 1992 and 7,5% for 1993. The declining profits(in absolute and relative terms) are mainly related to the decrease of the exports in 1993 in confront with the previous year. The company's indebtment is negligible in the years we are considering, but there will be a tendency for its increment, if the company will keep going with the plan of investments in distribution and transmission.
Given the regime of regulated electricity prices (they are exogenous to the company) the economic performance of the company will highly depend on the total costs of production it faces (adding up all the costs in stages of production, transmission & distribution).

ELECTRICITY PRICE REGULATION

The price regime was changed in the last month, but I find it necessary to describe the price regime it existed previously and under which, these results, we described before, were achieved.
Electricity prices were regulated by a very simple tariff system, essentially comprising two tariff categories, domestic and non domestic.
The domestic tariff was a block type tariff, with two blocks. A flat rate applied to all domestic consumers until a limit of 250 kwh/per month and a higher rate applied to the second block i.e. to all consumption above the limit of 250 KWh/ per month.
The non-domestic tariff is a flat rate, applying to all non-domestic consumers, without making differences for their size(installed power) or voltage level at which they are connected.
Only two industrial big consumers , the petroleum industry and the steel industry have special tariffs with reduced rates. This was some kind of subsidy to these industries considered as of strategic importance from the former regime.
Last month the government in its way of reforms, declared that it was going to liberalize the prices of energy sources and bring them to the world market level. The government decision touched the prices for gasoline, kerosene for domestic uses, coal and electricity.
It was announced also that the final target for the electricity prices is around 6,5 Lek/KWh and will be reached within 1996.
Their first move was to put a flat tariff for all types of consumers at the level of 4,5 Lek/KWh.

ELECTRICITY PRICES		*1993*	*1994*
Domestic consumers			*4,5 lek/KWh*
Consumption in the first block (0-250KWh)		*0,8 lek/KWh*	
All consumption above this block		*3,0Lek/KWh*	
Non-domestic consumers			*4,5 lek/KWh*
All non-domestic		*2,0Lek/KWh*	
Petroleum companies		*1,45 Lek/KWh*	
Steel industry		*1,65 Lek/KWh*	

TABLE 7

AN APPROXIMATION OF THE COSTS FOR SEPARATED SUBSECTORS OF THE POWER INDUSTRY.

From the balance sheet of the power company namely the A.E.C.(You can see Page 4 and 5 in the Appendix) presenting the break-down of the assets of the power company we can make a approximation of the costs in the different subsectors of the industry beginning with generation and then with transmission and distribution. The calculation of the expenditure and the costs is presented in the Page 7 of the Appendix and the table presenting the results is still in the Appendix on the Page 6. In the Appendix is given also a schematic picture of costs formation process and sales for every stage of the power industry.

Let us go step by step and analyze the cost formation process beginning from the first stage, that is ***generation***.

In Albania there are, as already mentioned before, two sources of electricity generation, namely *thermo* and *hydro* power-generation.

Let us first consider hydro-generation.

Hydro power generation.

The total costs for the hydro-power plants are separated in the *capital costs* (fixed costs) and in *operating and maintenance costs* (or running costs).
In general for the hydro capacities, and especially in the case for the storage of water type of plants, the fixed costs are the determinant part of the total costs.
In the table and graph below are shown the running costs and capital costs for different type of plants in Austria. This table and graph is really build up for Austrian case in particular, but without much difference could be accepted as the table representing the values of the fixed costs, or capacity costs, and running costs for the types of the plants described in it. In other words, we can say it represents an approximation for the world market prices in 1988 for the new installed capacities, in the types of plants that are represented in it.

Also in this table we can figure out what will be the costs of the future hydro-power and thermo-power projects in Albania, which in the next years will approach offered in the world market.
We have to mention that regarding the hydro-power projects, a big role in determining the capacity costs will play the particular location of the plant, the question of the property rights (or reimbursements, question that has been risen very sharply these days in Albania) and the problems related to the environmental impact of these projects.
The latest seems to be undermined today but, even in the near future will be an important factor in costs determination.

It is quite evident from the table and the graph that, for the hydro storage water plants with yearly water regulation, the fixed costs are very high if confronted to the running costs.
This is true also for the hydro storage plants with daily regulation and for run of the river plant.

Type of plant	*Name of the plant*	*Capacity cost(ASS/kWh)*	*Running costs(ASS/kWh)*
Gasturbine	Energiebericht	0.08	0.702
Gas-plant	Simmering/4	0.12	0.467
Oil-plant	Simmering	0.12	0.421
Coal-plant	Durnrohr	0.17	0.395
Run of the river	Grafenhof	0.61	0.009
Run-of-the river(Danube)	Wien	0.67	0.006
Daily regulation lake	Koralpe	0.84	0.012
Yearly regulation lake	Dofertal	1.13	0.008

Capacity costs are annualised
It is assumed the life time of the thermo plants 30 years and 90 years for hydropower plants.
It is assumed yearly operation of 7000 hours.
* InAS$ of 1988; 1USD=10 AS$

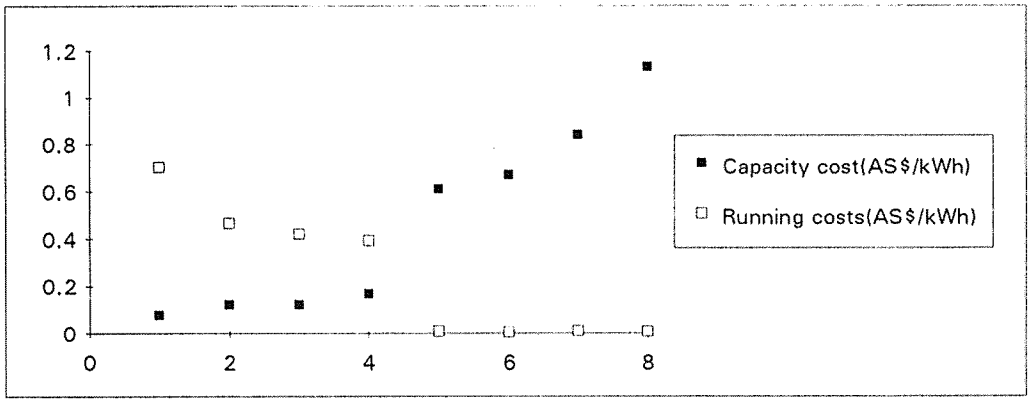


TABLE 8

Let us return to the discussion on the real costs in the Albanian hydro-power plants. From our analyses we find that the total costs of electricity produced in the Albanian Hydro power plant are extremely low.
This is due to the extremely low fixed costs. The running cost seem to be at the same level as in the Austrian plants of the same type.
Considering first the fixed costs, we could say that there are three main reasons for this low value of the capital costs in the case of the A.E.C.

1. The very low evaluation of the capital assets. Their evaluation is done in non-realistic prices of the period in which the plants were built, and their value it is not reevaluated for the coefficient indicating the devaluation of the Albanian currency from that time.
2. The still unclear situation regarding the property rights (e.g. water rights, irrigation rights, power production rights, land ownership, etc. Probably, when these problems will be settled they will contribute to the increase of the fixed costs component.
3. The very loose juridiction conserning the environmental impact of the hydro-projects.

COSTS OF HYDRO-GENERATION		
	Mio. Lek	%
Salaries & wages	28,65	12,50%
Material & other expenditure	68,1	29,70%
Administration & general expenditure	10,9	4,70%
MAINTENANCE & OPERATION COSTS	*109,65*	*46,90%*
CAPITAL COSTS (Depreciation)	*121,8*	*53,10%*
TOTAL	229,45	100%
Electricity output (GWh)	3250	-
Cost of KWh (Lek or US Cents)	*0,0706*	-

TABLE 9

Conserning the figure for the running costs, it comparable with the respective figure for the Austrian similar hydro plants.
This fact is due to the changes in technology between the two systems. In Albania they are using an older technology, which means that they use more labor for unit of power installed and have more problems during the operation of the same.
The advantages deriving from the relatively low costs of the labor force in Albania are partly shadowed from the lower productivity and the overemployment in the power industry [The coefficient of 2,1 MW of installed capacity/employee (1426 MW/682 employees) is low even if compared with thermo power plants in western standards.], but still the weight of the overall labor costs is well under the respective weight in western power industries.

Thermo-Power Generation

To make more comprehensive and more evident the situation of the thermo-power plants of the A.E.C., in the Table 10, we have compared the cost components in the Albanian thermo plants to the thermo plant of BRABANT in the Netherlands which, the uses the same kind of fuel (oil) as the Albanian plants, and produces electricity operating 6 units with a installed power of 2194 MW.

EXPENDITURE BREAK-DOWN OF ALBANIAN THERMO-PLANT AND BRABANT PLANT(NETHERLANDS)		
	ALBANIAN PLANT	BRABANT PLANT
Salaries & Wages	5.90%	12%
Fuel costs	87.50%	66%
Depreciation	4%	14.40%
Material & other exp.	2.30%	7.70%
Installed cap./employee(MW/empl)	0.371	3.3
Cost of unit of KWh (US cents)	4.033	3.4

TABLE 10

Let us consider first the *capital costs* component.
- Depreciation (capital costs or fixed costs) contributes to the total costs with only for 4% in the case of the Albanian plant. This low parameter can be explained with the very low evaluation of the capital assets, point which we already mentioned in analyzing the hydro case. In case of revaluation of the assets the costs of depreciation will rise sharply (is estimated that will increase approximately 15 times the present value), determining a sharp increase also in costs of the thermo-generated electricity, which even now is relatively high.
In considering the *running costs* we could say that :
- The weight of fuel costs are bigger in %-terms in the Albanian plant because, the weights of other factors are smaller if compared to the respective figures corresponding to the Dutch plant for the reasons we will consider later on.
- Material expenditure contribution, in cost formation, is also rather small due to low rates of material consumption applied by the A.E.C. for the unit of power installed, and also to the low evaluation of the capital assets.
- The parameter of the labor costs should be discussed together with the coefficient that measures the installed capacity for employee. Labor contribution to the cost formation is very low in the Albanian case, even the fact that the coefficient of efficiency is some 8,5 times lower from the Dutch case. That is due to the very low level of wages in Albania in confront with the Netherlands.
The actual figure of installed power for employee (0,371 MW/employee) will be a very critic point for the future of the thermo production because, if this parameter remains constant, as seems to be in the intentions of the A.E.C. administration, (The A.E.C. plans to employ the actual labor force for the years to came) and takes place the planned increase of wages in real terms of 20% per Year (it will double the real wage in 3,5 years), the labor costs will increase, contributing in the increase of the total costs of thermo generation.

The conclusion that can easily be derived in the case of the thermo-power generation is that the Albanian plants are running inefficiently even now that they have very low labor and capital costs. Their cost of production is larger compared with that of the Brambant plant. This fact shows once more the low efficiency of the technology installed.

Transmission

In the transmission stage is added some 10% of the total expenditure. Also during transmission is lost about 10,5% of the electricity transmitted from the previous stage.

The level of transmission losses should be considered a little bit high, and mainly is due to the already old-dated technology of the subsector.
The A.E.C. plans to invest in new technology in the transmission subsector with the goals of increasing the security of the system and reducing the transmission losses (planed to be reduced at the figure of 8% in 1998).
- The level of the labor contribution in transmission costs is also considered as high if comapred to other similar systems.
- The depreciation weight in cost formation will increase sharply as the investment will take place because, their value will be evaluated in current prices and will not be place for underevaluation, which is the case for the old assets in exploitation.

Administration and R & D

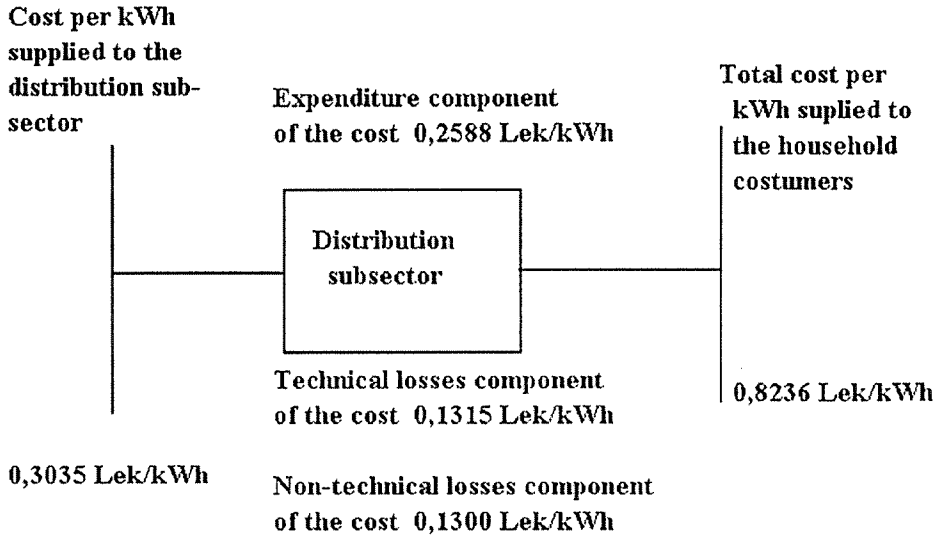
Administration and R&D contributes only for about 5% to the total costs of electricity to the end use consumers.
The costs of administration and the research & development activities are mainly determined by the labor costs. As mentioned before in the paper those costs will increase rapidly as the wage will increase and the number of the employees will stay constant.
It is difficult to evaluate the effectively of the people who works in this bureaucratic institutions but from the experience of public enterprises of Eastern countries which has been privatized we can say that the public enterprises, in these countries, are overstuffed in comparison with the private one.

Distribution

We realize that this subsector contributes for more than 60% of the total costs of electricity to the end user.
In analyzing the costs of the distribution stage we shall concentrate in two main problems which are evident.
1 - The overemloyment of the sector.
2 - The non-technical losses.
As one can see easily from the Table in the Appendix, the number of employee in the distribution subsector is 5090, which makes about 53,6% of the total labor force employed in the A.E.C.
Trying to judge for the ***efficiency*** of the labor force employed in the distribution subsector and the ***optimal level of emploeement***, we could calculate a coefficient measuring the ***electricity supplied/per employee*** in the distribution subsector of the power industry.
If calculated, the value of this coefficient for Albania will be 0,67 GWh/employee. If we compare it with the same figure calculated (with some approximations) for Romania, we will find it about 3.5 times lower (for Romania the figure should be around 2.3 GWh/employee).

This comparison shows us that even for Eastern European countries standard this level of overemployment is unacceptable.

What is even more strange, is the fact that the A.E.C. is not intended to proceed in reduction of the personnel in the subsector.



The picture of the cost formation process in the distribution subsector

FIGURE 1

Another parameter that depend partially in the efficiency of the subsector is *the **non-technical losses or unregistered consumption.***

This phenomena is due to the destruction and lack of metering devices. (There are figures speaking about a lack of metering devices at more than 25% of the household costumers.) That happened during the 1990 to 1992, that is, in the peak of transition period which was very charged with social problems, and a period during which in Albania was a lack of order and government.

Also, influenced here, what we said before about the effectiveness of the people working in the distribution sector. It is my opinion that if their engagement in their duty would had been correct (the company didn't provided incentives meaning to increase it), the damages wouldn't had been of this dimensions.

Now that the questions of government and order seems to be established, considerable investments are needed to bring the situation as it was before. Investments are urgently needed also to update the distribution network in order meet the increasing internal demand [shifted up due to a dramatic increase of 54% in 1992 in the households consumption and a even more dramatic 61% in 1993].

As a result of the above mentioned inefficiencies the costs of electricity more than doubles in the distribution subsector.

Conclusion about the costs of production faced by the A.E.C. in different stages of the industry.

The analysis we made about the costs faced by the A.E.C. in different stages of the industry gives us a picture of the cost formation process taking place.
The most striking things in this analysis are:
1. The extremely low fixed costs related to the hydro-power plants.
2. The fact that more than 60% of the total costs is formed in the
   stage of distribution.
3. The high overemployment in all stages of the industry.

PART III

WESTERN AND EASTERN EXPERIENCES IN RESTRUCTURING THE POWER MARKET.

In this chapter we would like to analyze the experience of the European most advanced situations in the field of the power industry.

The common tendency for the power industry in the world is to change the structure from vertically integrated form, run as public company, to a structure with separated subsectors, which are run as private companies or at least partially privatised.

The tendency is persistent, even that, there are some empirical studies that showing that vertically integrated firms producing the same sample mean in generating and distribution levels, shows costs some 12% lower than vertically disintegrated firms. (see Kaserman & Mayo in the references list)

But it seems that the advantages deriving from the competition in the different stages of the industry may lead to efficiency gains that could offset the efficiency losses from vertical divestiture.

The most interesting cases are England & Wales, Norway and Poland but, there are also other countries (Check Republic & Slovakia) that has already committed themselves to this kind organization of the power market.

Also there are other situations when the power industries will be privatized, but will conserve the present vertically integrated form. It seems that Italians could act this way.

Many of the countries that are deregulating their power industry, do face large budged deficits which make it difficult for their government to finance the especially costly energetic programs.

By introducing the market structure, the government intends to live to the market the solution of some important questions as the financement of the new projects, efficient use of resources, meeting the increasing demand, etc.

Anyway the government intends always to preserve a important role in the control and regulation of the market if not a direct share of the most important companies acting within the power market.

This form of organization of the market has shown to be easily suitable to the generation part of the power market, by introducing sometimes, quite big competition in generation markets betwen the old producers and new comers in the market, which usualy pushes toward a reduction in prices of electricity in the suply markets and to the creation of surplus capacity for generation.

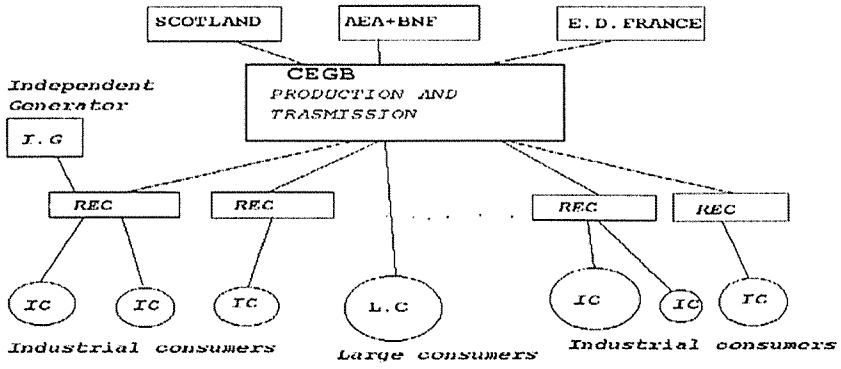
In transmission stage of the industry there is not so much difference from the integrated form, because this part of the industry remains in the state control, or with an ownership structure such that could create equal conditions for all market partecipants and fair competition conditions in generation and distribution markets.

As for the distribution side where the competition is a little difficult to be introduced, some reform programs plan to introduce market conditions in some steeps. We could say that the distribution market follows the generation markets in the way of reformations.

ENGLAND AND WALES.

Situation in England and Wales before the change in the structure of the power industry.

The situation in England and Wales before the deregulation of the market was similar to the actual situation in different western countries, that is a state owned monopoly carrying out all functions, from generation to transmission and distribution. There was a single company carrying out generation and transmission and 12 incorporated regional companies responsible for distribution in their region. Imports and exports were carried out from the CEGB company, and was the same CEGB to deal with the independent producers who were wishing to sell to the grid their surpluses of electricity production.



THE UK ELECTRICITY SUPLY INDUSTRY BEFORE 31 MARCH, 1990

FIGURE 2

- The state owned CEGB company was responsible for generation and transmission.
- Electricity sold at Bulk Supply Tariff.
- 12 Area boards responsible for distribution and for sales.

THE NEW ORGANIZATION OF THE MARKET

In 1989 the power market in the England nad Wales were deregulated and the picture of the market that resulted after the deregulation was quite different from the previous one. Let us make a short description of the situation.

- 3 generating companies ; not only to sell to the REC^{S} but also to industrial consumers of a certain size (the size of

the companies able to shop electricity directly from the producers was firs setted at the limit of 1 MW instaled power and succesively reduced to 0,1 MW).

- National Grid Company; transmission and runs the nuclear capacities of the former CEGB, which are organized as a separate company named Nuclear Electric Company.
- 12 Regional Electricity Companies; primarily responsible for electricity distribution; The RECs are allowed to produce up to 15% of the electricity delivered to the consumers, limit that will be removed in the same time with the limit for generation companies to supply directly consumers below a certain size. The RECs are in fact the owners of the NGC because, the NGC is a settled as a stock company and the RECs are allowed to own shares of the same company; This fact is very important because it creates the conditions for a open market in the generation side. In fact the RECs are very interesed to have competition in geneation because this will pull the prices down. Being the owners of the NGC alows them to offer the same conditions to all the probable new comers in the market, fact that is very important given the natural monopoly form of the high voltage grid.
- Independent Power Producers; They are allowed to enter the market at the same conditions as the other producers and it is evidence that their weight in the market will be increased for the years to came.

THE POOL

The creation of the POOL is the most inovative element of the whole deregulation procces. The POOL is acting as a broker between the producers and the distributors and also acts as a clearing house for the payment procedure.

- Heart of the new structure ; where the electricity is bought and sold.
- Generators bid price and availability for each generating set.
- Market price calculated daily for each half-hour of the following day.
- Price signalizing for the power station construction.

REGULATION

On the top of the structure in ther newly deregulated industry is the
Office of Electricity Regulation which is in charge as a monitoring authority over the whole market, from generation to distribution.

FEATURES OF THE NEW STRUCTURE

The deregulation of the power industry brought a lot of changes in the market and a considerable part of them should be considered as positive features of the new sytstem. Let us mention some of the most important ones.

- Competition on the supply markets.

Controlled expansion of the unregulated (non-franchisee) market.

- Competition in generation.
- Competition in distribution to be introduced in different stages.

  Consumers with a certain installed power will be allowed to purchase electricity

  from other RECs or directly from producers beginning from March 1994, and

  from 1997 theoretically anyone would be able to shop around for electricity.
- New power stations build from new entrants in the market.
- The increased capacity and the more efficient use of the existing capacities from the new private owners will create excess of capacity and when market conditions will be stabilized in the distribution side also will lead to lower prices for consumers.

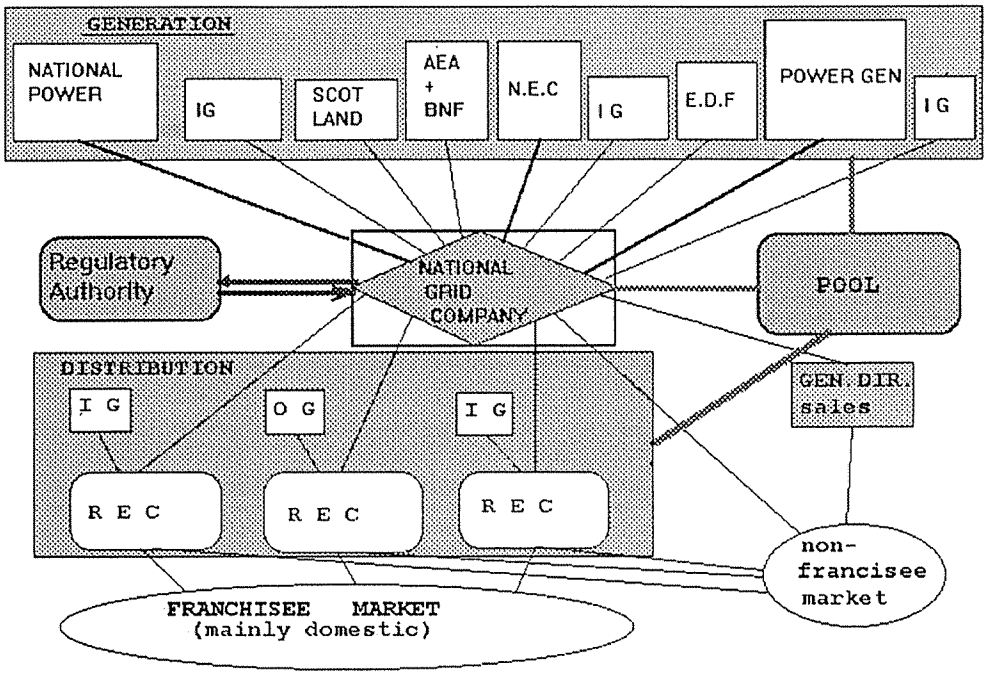


FIGURE 3

NORWAY

The Norwegian case has some similarities with the Albanian one, mainly for the structure of the power production industry.(is 100% hydro-generation in Norway and approximately 95% of hyrdo-generation in Albania.)

Since January 1991 the Norwegian electricity supply industry has been deregulated and restructured. The energy act will dismantle the vertical integration of the electric power system by separating production companies from distribution companies.Production comapnies will operate in a competitive wholesale power suply market. The transmission network will be established as a separate company with a common carrier status. Pricing in the wholesale market will be based in the market conditions.

This restructuring abolished the utilities former right to supply a consumer within its supply area, by that introducing the supply side competition. Consumers theoretically of any size, can now shop around for the best supply deal with an utility.

However the transmission and distribution networks will still remain monopolies while the sale of the electricity among producers, distributors and consumers will lead itself to market conditions.

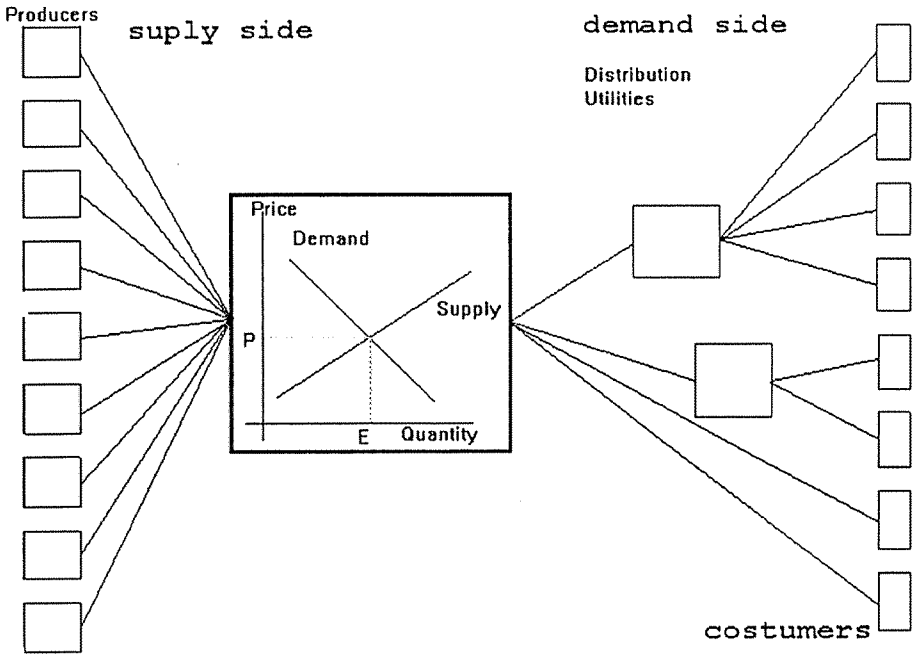
The deregulation has so far created a supply side competition where a large number of consumers have made use of their possibilities to choose a new, more competitive producer. The organizational structure of this system is shown in the figure.

The production, transmission and distribution of electricity in Norway are presently run by some 70 primary producers and 230 utilities. They are owned mainly by municipalities, counties and the central government. The organizational structure is complex with a mixture of vertically integrated firms, wholesale and production companies and utilities engaged only in distribution.

The situation is significantly different from the situation created in England after the deregulation, where the supply side competition was initially restricted to only three big producers.

The number of utilities in the supply market is not the only difference between the Norwegian deregulation and the British one.

Prices in the wholesale market are figured out by a supply and demand mechanism. In contrast to the British system no correction (capacity credit) is imposed by a market coordinator. This correction has been introduced in England to give an incentive to invest in new capacities. In a hydroelectric system as the Norwegian, the production capacity in terms of MW is not a critical point as in the thermal system. It is the annual production capability in terms of Twh/year that is a critical parameter. The shortage of the capacity will be caused by lack of precipitation. But this will not happen over night. Prices will rise and the consumption will decrease in any other market.



Organizational structure of the Norwegian system

FIGURE 4

Deregulation has caused a significant impact on how to organize the transport of electricity. The primary goal is that this transportation will take place in a common carrier facility, and with cost-based transportation tariffs. Transportation tariffs for all network levels shall include the total costs of transportation in all higher network levels. This implies that the charge a consumer connected to a regional network has to pay, will reflect what the regional network owner has paid to the national grid and what the network-owner's revenue requirements operating the regional network.

From the consumers point of view, deregulation has given the opportnity to shop around for the best electricity supply. In principle these apply to all kind of consumers independently from their size, however due to initial costs and information barriers, so far, primarily large consumers have been active in the market. (for large consumers here is understood to be consumers with a yearly consumption greater than 250 MWh)

After two years from the deregulation the market has not reached the stable state either from the utility industry or from the consumers point of view. The utilities are still working with the process to obtain the separation between the activities that are natural monopolies and those parts that compete in a competitive market. This process includes also the running of the distribution utilities more efficient. There has been also a reduction in the number of the utilities. Market makers and brokers have contributed to the creation and developement of the power market as the consumers are not used to use the market for purchasing electric power. New systems of tariffs of both transportation and power are worked out.

POLAND

The Polish case is very interesting experience for the restructuring of the power industries in all the East European countries, because Poland was the first country from the former Eastern block to implement the reforms in power industry.

In general terms the situation that the Eastern countries inherited from the former regimes was very similar in all of them.

The state owned monopoly organized in the form of the vertically integrated firm was common to all these economies, but also every country had its peculiar differences mainly due to the different base of resources available in each of these countries.

Very similar to the Polish experience seems to be the Hungarian one and in the same direction seems to move the Checks also.

The construction and development of the Polish power industry was conducted under circumstances of fully centralized economy. As a result the electrical power industry was rather significantly developed and managed to meet industry demand for energy (especially metallurgy, mining and chemistry).In the years of relative stabilization of the economy , the participation of the industry in electric energy consumption exceeded 80%

The whole industry comprising production, transmission and distribution was state controlled, investment were financed through budgetary channels and there was little relation between prices of electric energy covered by the consumers and the real cost of its production. Many economical decisions concerning the development of the electrical power industry caused unacceptable social consequences such as poisoning and environmental pollution, resulting in threat to society health.

The above mentioned disadvantageous outputs, generally existing waste and ineffective usage of the electric energy, lead to series of organizational changes which proved to be ineffective. The changes resulted to the creation of the Power Engineering and Brown Coal Community in 1987 which grouped over 100 state-fun enterprises.

These enterprises were as follows: electric power stations, heat and power generating plants, energetic works , brown coal mines , repair and production-repair works, power grid performing works , surface mining devices producing factories and electrical power engineering construction enterprises.

The whole country's energy users were An other reason for looking to the polish experience is that Poland is the East European country that has gone forward more than any other in the reorganization of power industry.)

included into a uniform tariff system.

An arbitrary system of interior prices existed within the Power Engineering and Brown Coal Community which acted for ineffective enterprises (electric power stations and energetic works) advantage, at the cost of the best ones. By the end of the 1989 these arbitrary activities were strengthened by an immense scope of budgetary subsidies for statutory undertaking of electrical power engineering.

- As a result of the above relatively low prices of electric energy it was impossible to define economically justifiable demand for it [the cost of using electricity was cheap as

compared to other sources of energy and this brings to overconsumption of electricity and switches consumption from other sources of energy (as their prices increase in time) to cheap electricity consumption.]. With low energy prices, tariff solutions, intended to level a day energy load and reduce production costs, were ineffective.

- On the way to the market economy Poland has started deep structural changes within the polish Power Sector:

Power and Brown Coal Board , fully centralized organization was finally dissolved on September 1990.
By this time a plan of reform was sat to place and the work implement to implement it begun. The main purposes of the process of restructuring consist in:
- Securing an efficient and reliable way of satisfying a demand for energy and electric power.
- Securing and effective usage of energy carriers mainly by introducing efficient price mechanisms.
- Establishing independent and energetic firms acting on market rules, relieved from the state control and not being state property.
- Suitable social costs of energy production and utilization

In this connection, the basic was to establish structures creating effective impulses for an internal efficiency and price supervision. It was possible either by the introduction of feasible competition or economical regulation.
At present Polish Power Sector is divided into three economically and operationally interrelated which are as follows:

- **Generation -**

Power and CHP plants in number of 33 representing 29000 MW of total 32000 MW installed generating as of lignite fired and CHP plants.
The reform will provide for the creation of four to five separate firms including power stations characterized by low and high extreme costs. It is foreseen this way that the individual electric power plants entering the company will loose their identity in the benefit of the company.

- **transmission**

system of total length 12.150 km consists of 750,400, and 220 kv lines, and substations operating at these voltages.The responsibility for operation of transmission system and power system control has been given to the Polish Power Grid Company - PPGC.
PPGC which is the heart of the Polish Power Sector (similar to the England's NGC , or to the Norwegian Pool), it is responsible for transmission lines, bulk electricity purchases, international electricity contracting and maintaining electricity pool for selling energy to distribution companies, which by their turn are supplying electricity to consumers.
The company is to secure an efficiency of work of domestic energetic system by taking in consideration the costs of production at different domestic producers, costs of transmission and international exchange.

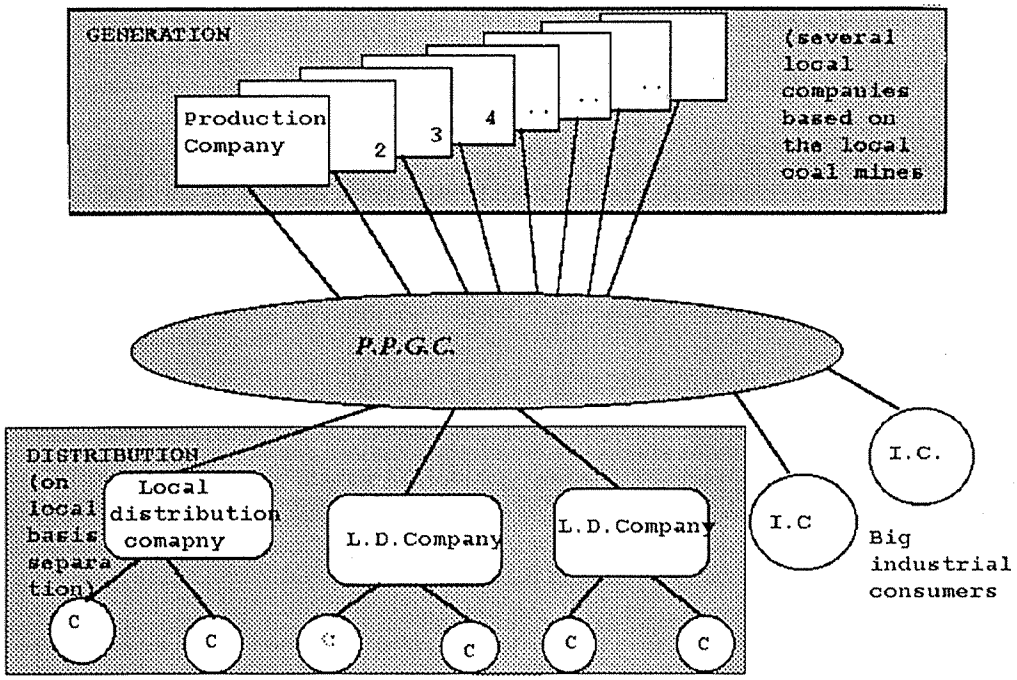


FIGURE 5

- **Distribution**

Independent distribution companies (33 of them) , spread in the whole country area , operating transmission and distribution networks of 110 Kv and downwards supplying electricity to the final consumers.

At the first phase all enterprises would be independent from each other and directly subjected to Ministry of Industry.

During the period of the realization of the reforms (it would take more than 4 years to be implemented) all the enterprises within the Polish Power Sector are going to be transformed to State stock Companies, and mainly privatized by sales of the state stakes to the stock market.

As a first steep in the way of reforms the PPGC was established on August 1990 as a State Stock Company fully owned by the State Treasury.

Further steps had followed that first one and now there are companies from the Polish power system that are quoted to the Warsaw Stock Exchange.

PART IV

The actual government has committed itself to the way of market reforms. From recent declarations by high ranked government officials one can easily deduct that the reform and privatization will go through the power sector as well.
Several options will be present to the government, when it will consider the organization of the power market in Albania.
At least theoretically, the decision will be taken considering the structure that will provide the best solution to the questions of creating incentives to invest in new capacity (stability of the system, reserve capacity), low costs of production, price control, money collection, etc.

1. As **first option** should be considered the version of the **vertically integrated form of utility.**

But even within the same vertically integrated form of the market, the differences in ownership structure will bring differences in the performance of the company.
Assuming a ***state owned vertically integrated monopoly***, which is the case of the existing situation, very few things will change. The A.E.C. will remain vertically integrated as it is now, playing the role of the monopoly.
The A.E.C. management has already considered the case and assuming this form of organization of the power market, they have made some projections for the years to come.
Let us make some consideration on these projections and plans for the future of the A.E.C.
They base all these projections in assuming a rate of growth, for the total internal demand of only 3% per year.(we will consider later this figure)
- 1 - Till now there are no agreements with any company about upgrading the existing capacities. In the future, a loan from the EBRD and some other financial institutions will be provided for this purpose, but probably its effects will be visible only after some years.
- 2 - With a great probability the A.E.C. will not be able to install any new capacity till that time, [there are many chances that the Banja project, (60 MW and 250 GWh /year), commissioned for the 1997 will not be ready until then], but even in the eventuality that this project will be operative by 1997, it will just postpone the problem for the next year, because there are not other new capacities commissioned nor for 1997 or for any later period.
- 3 - By the year 1997 the Albanian power industry will be able to fulfill only the domestic market demand, consequently, will not be able to export any quantity of electricity. (we remind you that electricity makes actually about 10 % of the total exports of the country and that the country runs a huge deficit in the trade balance, deficit financed at the moment from the IMF)
- 4 - This observation could be derived as a consequence of the second and third observations. By 1997 the A.E.C. will be obliged to operate as base load the thermo capacity it possesses. That means that, the short run marginal cost of the KWh produced in the Albanian power system (approximately 5 US cents/per KWh)will be greater than the respective figure for different European countries, and will exceed the opportunity cost(the price agreed with Greece for import/export activities

approximately 3 US cents). This will bring the A.E.C. to the situation that, it will probably be cheaper to import electricity than produce in its inefficient thermo-power plants.
- 5 - By 1996 the price that the company plan to charge to the customers is around 6,5 US cents/kWh. This would be in fact what their marginal running costs will be by that time, because of what we mentioned above, they will be using the thermo plants as base load plants.
This will be the price that the consumers will have to pay, and that is perfectly in line with the government intention to liberalize the prices of the energy sources electricity comprised. The government moved its first step in this direction early this year by introducing electricity prices at the level of 4,5 Lek(or Us cents)/KWh. This move seems to be motivated more from budgetary needs than a sincere desire to bring prices in line with world market prices, in order to bring in investments in power industry or to create more possibilities to the company to invest by itself in new capacities.
- 6 - The company does not plan to cut its labor force in the years to come. Also the wage bill is planed to increase, in real terms, at the rate of 20%/per year.
Considering what we said till now, this option does not seem to provide the best performance the government is expecting from the power industry to perform. So it will be difficult that the choice would fall on this form of market organization.

Let us add some other reasons that work against this choice.

- If the A.E.C. is run as a public enterprise it will be little hope that it will improve it's efficiency (let me remind that the record of 5,6 *workers/per kWh* is "bad" even for Eastern standards (the respective figure for Romania is 5,1 but the Romanian system is mainly thermo oriented, with a share of 74 % of thermo power in the total installed capacity) not to mention here Western standards.

- One could be doubtful in the ability of the A.E.C. to control efficiently the huge amount of money that will be invested in the power sector in Albania in the following years. The company has never by itself invested in new capacities, because all the projects, realized till now, were financed directly by the budged and supervised from the Ministry of Public Works, with no control of the company over the project financing. So, saying it in few words, the level of "know how" could be low.
- From the point of view of exploitation of the national recourses this option should be considered not optimal because at some point in time it will be obliged to make an inefficient use of the natural resources of the country(through the use as base load of the thermo power plants).
- But the main argument against this form of organization is that it doesn't provide a efficient solution to the rising demand, which is rising much more than the 3% assumed from the A.E.C.

BREAK-DOWN OF THE DOMESTIC CONSUMPTION						
	1988	1989	1990	1991	1992	1993***
TOTAL OF ELECTTRICITY SUPPLIED IN ALBANIA(GWh)	3232	3399,7	3300,4	2853,5	2745,6	3208
TOTAL MAXIMUM DEMAND (MW)	546	585	580	575	586	700
TRANSMISSION SYSTEM LOSSES(GWh)	325	306	315	285	323	350
DISTRIBUTION LOSSES(GWh) **	147	161	220	399	768	968
TOTAL ELECTRICITY SALES (GWh)	2760	2932	2764	2169	1654	1900
LARGE NON-DOMESTIC (GWh) *	875	954	882,2	656,5	294,8	490
OTHER NON-DOMESTIC(GWh)	1635,3	1708,3	1590,6	1200,8	880,1	640
HOUSEHOLD(GWh)	250	270,3	292	311,8	479,1	770
HOUSEHOLD CONSUMPTION CORRECTED FOR THE NON-TECHNICAL LOSS	251	275	310	460	864,1	1250
HOUSEHOLD CONSUMPTION IN % OFF TTHE TOTAL SALES	9%	9,20%	10,50%	14,30%	29%	40,50%
INCREASE OF HOUSHOLD CONSUMPTION IN CONFRONT OF THE PREVIOUS YEAR	-	8,00%	8,00%	6,50%	54%	61,00%

* - suplied directly by the production companies
** - include technical and non-technical losses assumed tto contribute for 50% each in the quantity off distribution losses
*** - estimations based on the data for first six months of the year.

TABLE 11

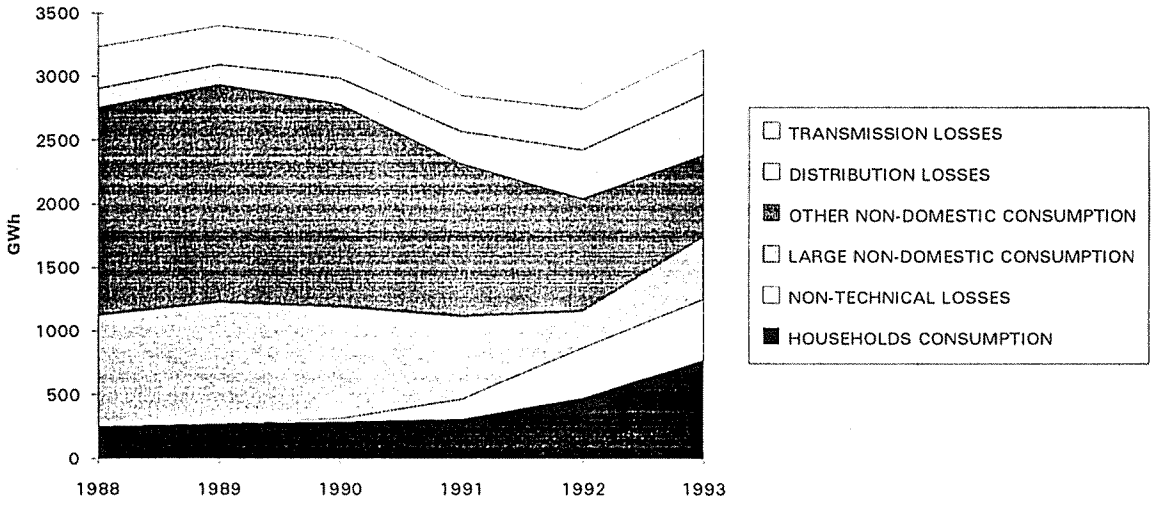
Let us consider more in detail the rate of growth of the demand for electricity. It is a key element if one would like to consider the future performance of the power market.

The government and IMF projections foresee, for Albania, a growth rate of the GDP about 5% per year. The rise in electrical production should be at least equal to this figure but not lower.

But we should consider another important fact.

Considering the fact that Albania starts from a very low per capita electricity consumption, it may be that the growth rate could exceed the growth rate of the GDP.

The household consumption, neglected during several decades of communist rule, will increase at rates that will probably exceed the rates of the growth of the GDP.



. FIGURE 6

As one can see from the Table 11 and from the Figure 6, beginning from 1989 there is a decline in the electricity consumption in Albania, which bottoms in 1992, to increase than steadily in the following year. We have already mentioned the reasons for which the consumption from large consumers or other

non-domestic consumers has declined (economic and political crisis). But it is quite visible that, in the same years there is not a fall in domestic consumption, all the contrary the household consumption has more than tripled from 1988 to 1993, or in terms of total sales, accounts now, if corrected for the non technical losses, for more than 40,5% in comparison with just 10% in 1988. The figure in percentage is influenced from the sharp decrease of industrial consumption, but the increase in GWh terms is more than evident, even without taking in account the non-technical losses, which for the greatest part should to be attributed to the household consumption.
We have to consider also that the industrial production has bottomed and there are signs that it could pick up again. It will not probably reach the level of 1989 but it will contribute consider by to the increase in the demand for electricity.
It is hard to believe that, given the arising GDP, the extraordinary high rates of growth of the domestic consumption and the recovery in the industrial production, the total internal demand will rise at the rate of 3% per year. So, it is very probable that the level of consumption of 1989 will be reached not as the A.E.C. projections assume, at 2000 but at 1994 or 1995.
By this terms it will be very probable that in 1998 Albania not only will not be able to export any kWh of electricity but, all the contrary will be importing electricity, in order to fulfill the internal demand.
- It is evident from this analysis of the growth of the internal demand that there is urgent need for investment in new capacities, to prevent using the old and inefficient thermo-power plants or to import electricity given the shortage of foreign currency the country actually faces and probably will continue to face in the following years.
- The only sure advantage, from the point of view of the government, of the state owned monopoly is that it offers the simplest way to subsidize the electricity prices, if this was intentioned by the government (but it doesn't), or to use the electricity prices as a mean to improve the budged result.

An other possibility of organization for the Vertically integrated company is the creation of a ***private monopoly running the power market.***
This situation could be created easily if the government proceeds to the privatization of the A.E.C. without first deregulating the market and separating the A.E.C. in different companies.
As we said at the beginning of this discussion the different structures of ownership of the company will result in different performances from the company itself. But, whatever the share of the private investors in the monopolistic company, their presence will bias the company's management decisions towards the profits and not towards the social welfare, as one could argue in the case of a public monopoly.
If a private monopoly is to take over, the state will loose the advantage that had in the case of a public monopoly, to subsidize the prices of electricity to the end user. It could still do it, if in its intentions, but not through the power company.
- Privatization could also mean the sale of the shares to foreign companies with interests in the field. Participation of

the foreign capital (if realized in the form of an addition of the company's assets) to the privatization process should be preferred to the privatization by vouchers, because, it will bring new capital or technology(depends on the probable arrangements)to the company, contributing this way to the improvement of its situation and of that of the whole power market.
The idea would be difficult to realize, due to very little incentive for foreign private capital to invest on the A.E.C. shares(this consideration is highly dependent on the price that the assets of the company will be charged, and the way the price of electricity will be regulated), mainly for two reasons.
a - the high level of non-technical losses and the degradation of the distribution network. This means for the private investor difficulty to collect the revenue for the sales realized.
b - the relatively high amount of investment needed to bring the technical operation under acceptable levels, specially in distribution.

It seems from this analysis that ***the Vertically Integrated Form of the market*** (in booth its forms of organization) doesn't provide sufficient incentives to invest in new capacities, because the A.E.C. being in a monopoly position, is sure it could charge the price it finds optimal to the consumers, and will be able to be profitable even by running the inefficient thermo power plants. Investing in technologies which could produce cheaper electricity will be nonsense for the A.E.C., which this way it will leave unused a part of its capital stock. From a consumer point of view, using the same arguments, will not be the best solution, because using expensive sources from the producer means high prices for the consumer.
Also, having a monopoly position as regarding the grid, it will be very easy for the A.E.C.(private or public) to prevent the entrance of new independent producers in the system through high barriers of entrance and high prices for the transmission of the electricity. The new comers also will be obliged to unveil in advance their plans to their future competitor, making it very easy for the A.E.C. to prevent them in their actions.
Also is important the fact that the A.E.C. will be the only source of information about costs of production, transmission and distribution. So it is real the risk that it will provide biased information to the probable future competitors, so that to prevent their entrance to the power market.
The problem of the monopoly of information (especially that regarding costs) becomes even more important in the case of a private monopoly, because the regulatory board that will exist in that case (being in charge so that to avoid surcharges to electricity prices and to insure fair rates of return for the private company running the power market) will be forced to use the their probably biased information, in forming the prices of electricity to the end user.

2. As **second option**, in regulating the power market, should be considered the version of **a split of the market in his three natural parts that is generation, transmission and distribution and subsequently the deregulation and privatization of separate parts of it.**
The idea for this kind of organization comes from the last years reorganizations of power industry in various European countries.

There are three main reasons for such restructuring:
1. to create competitive market for power producers, trying this way to introduce price competition and incentives to invest in new installed capacity able to produce relatively cheap electricity.
2. To keep the Power Grid under more efficient control and management. By operating the Power Grid by a separate specialized company should result in a more efficient operation compared with the present situation. Centralized maintenance and planing added to a closer control of investments could bring to lower cost for operation and maintenance.
3. To improve the collection of payments and reduce the non-paid consumption of electricity by introducing measures that could monitor consumers more closely and in a tougher way.
It is evident that many countries have done steps toward a market oriented reform. But analysing the Albanian case one has to put the question.
Could, this form of organization, be successfully implemented to the Albanian power market ?
- It will depend at first from electricity prices and the way they are going to be regulated. As we already mentioned, the government is intended to liberalize the electricity prices by 1996. The company will be allowed to charge prices based on their costs of production and a regulatory body will guarantee this. Taking this for granted, some private investors could invest in new cheap capacities and compete successfully with the inefficient thermo capacities that already exist in the system.
- In the case of the Albanian power system one could argue that being a relatively small market and with a particular concentration of the power production (about 80 % of the total generation comes from 3 H.P.plants situated in the river Drin) will be difficult to introduce the competition in the generation market. The company owning these three plants will be given a certain market power and it could be able to influence the price.
- It could be argued that this form of organization will need some time before implementation, because of the need for some legal framework and institutions that simply doesn't exist at the moment in Albania and therefore should be developed.

The resulting figure of the power market in Albania after a possible implementation of the above mentioned program of reforms, could be as shown in the Figure 2. This should be considered as the figure that will result when the whole reform had taken place and not necessarily the day after its proclaim from the government. Many countries had undertaken the reform gradually, by making several steeps in the direction they find optimal. These steps that could be undertaken before a reform that goes in the direction of the deregulation of the market are:
- **Build, Own, Operate** (when the government gives possibility for other competitors to build their own power plants and operate them within the system)
- **Competitive access for non-Utility Generation.** (Terms for sale of the power published from the utility. The utility offering the same prices for all the probable new participants)

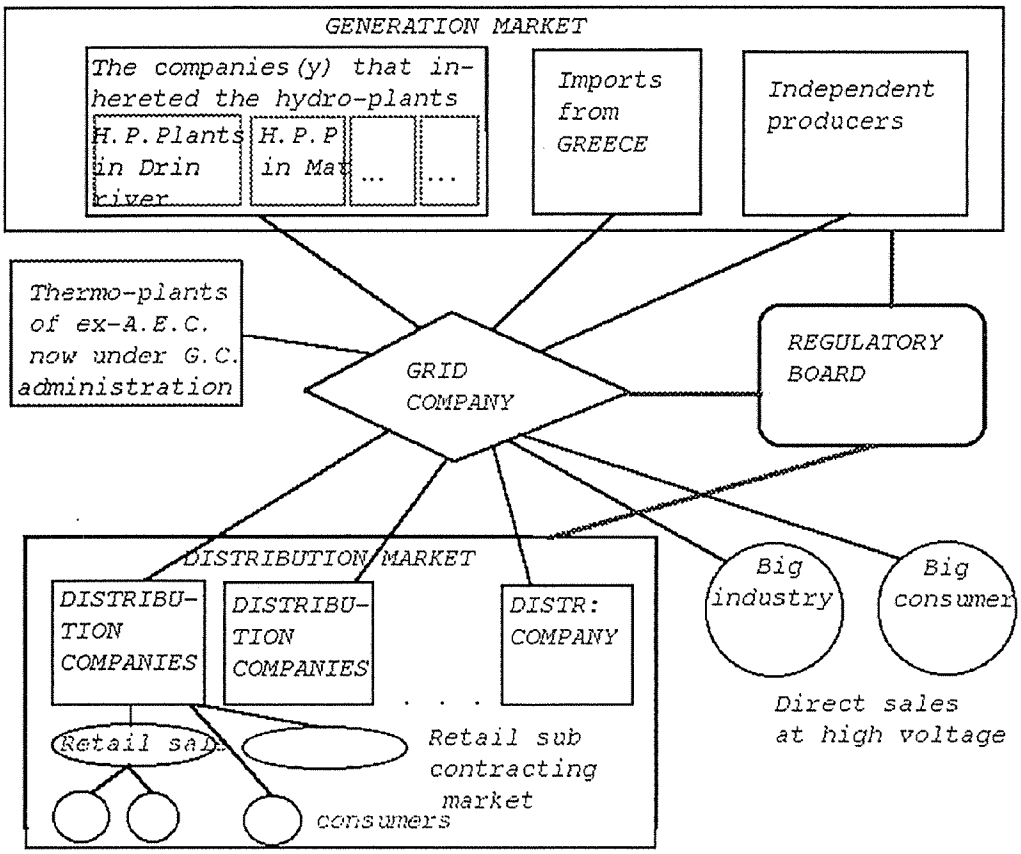


Figure 7
The probable figure resulting after the reforms.

As it could be seen from the picture, in the structure resulting from the reform will be a clear cut separation between the different functions in the market. Transmission, production and distribution will be run by different companies and in some parts of the market (generation) the same function could be provided by several companies competing with each other.
The resulting figure is mostly inspired to the British reform.
The ***transmission*** functions, despatching, operation and maintenance of the national high voltage grid and planning functions should be played by a national grid company which must be a 100 % state owned company or with such a structure that will favor competition in the generation part of the market.
Being a public company for the Grid Company will be essential, because only this way it could create the same conditions for all probable participants of the generation market and will provide the necessary information for the newcomers.
The public ownership of the grid company also makes possible, a simultaneous, subsidizing of the electricity prices at the end-user and competition at the generation level.
The Grid Company could operate as a non-profit company, but it could use different methods to influence the development of the system in the desired direction. For example it could use overcharges for prices at peak hours, and price bonuses for

distribution companies that show interest in reducing peak demand and invest in increasing the efficiency of use from the end-use consumer. Also could introduce the Yardstick competition in the demand side between distribution companies by introducing schemes for comparing performance of different utilities, associating them with rewards or penalties in tariff increases.
Some of the inefficient thermo power plants could be incorporated to the Grid Company, as it is the case in England with the similar nuclear capacities. In this case they could be considered as a cool or strategic reserve for the system, a cost that should be beard by all the participants in the market. This could be the case of the thermo-power plant of Fieri (which makes 75% of the total installed capacity of thermal origin).
The other thermo power plant (Ballshi, 24 MW, 36 GWh/year) could be sold to the refinery in which is almost incorporated (it supplies steam) The same could happen to the other thermo-power plants. In fact most of them have close links with the nearby industries, which in fact determine their daily load curve based on their demand for steam or heat.
Subsequently they could enter to the power market as independent producers and supply their excess production of power.
With this kind of organization of the market it exists the possibility to subsidize the prices at the consumer, if this will be the intention of the government, but live the generation part at market condition.

Let see what happens to the **generation market** and try to explain what I said before about subsidizing the price in the level of transmission and distribution.
- What for sure we will have in the generation market is the company that inherited the hydro-capacity from the A.E.C.. If this will be a public or a private company is another story, but what we can say for sure is that their operating average cost (at the moment the costs of electricity produced from the hydro capacity of the A.E.C. is of about 0.077 ct/kWh.)
With this costs and with the market price that should be around 3 ct/kwh the level of taxation that the regulatory board must impose to this company must be very high so that the company will not exaggerate the profit, but generate the normal rate of return plus some variable factor X which should be connected to the efficiency factor. This could be arranged through the levels of the excise tax, through the rent or the tax of the property of the hydro-power capacities, or in other ways.
But we said that by 1997 or 1998 the hydro-capacity alone could not cover the whole demand of the internal market, this way in the market there must be some other sources to fill the gap.
The probable sources can be the following :

a - the existing thermo capacities of the public company charged with the grid administration.(but I already mentioned before that their cost of production is relatively high and their functioning as base load plants would be unwished for economic reasons.)

b - the second source can be the import from Greece (because for Yugoslavia at this moment nobody can tell for sure what is going to happen and when).
This source is not very reliable from the technical point of view , consisting in only one line, which fact creates some

concern about the stability of the system, because we are talking here for imports that will be regular, big quantities and for relatively long periods of time.
Also is uncertain, because of the fact that Greece is not a net exporter of the electricity.
There is a third reason for considering this source a non reliable one and is a political reason. Greece has used in the past economical means to make pressure to the neighbors(take the case of Macedonia).

c - the third source could be the newcomers in the market.
Probably with the price established in the generating market some private investors may be supported by foreign investors could build new competitive capacities which could enter the market now or at the moment the price of the electricity willbe liberalized.

What is essential for this form of the market is the institution of a **regulatory board** which must be independent from all the participants in the market and also from the government, and other institutions of this kind.
The regulatory board must have the right to control the rate of return of the all participants of the market, having for this all the necessarily information from the enterprises. It must be the government adviser about costs at the generation level, and about the efficiency component of the price paid to the generation companies.
This regulatory board must have functions of supervisor also in the distribution side, in the case, the latest will be devised from the transmission and privatized or partially privatized.

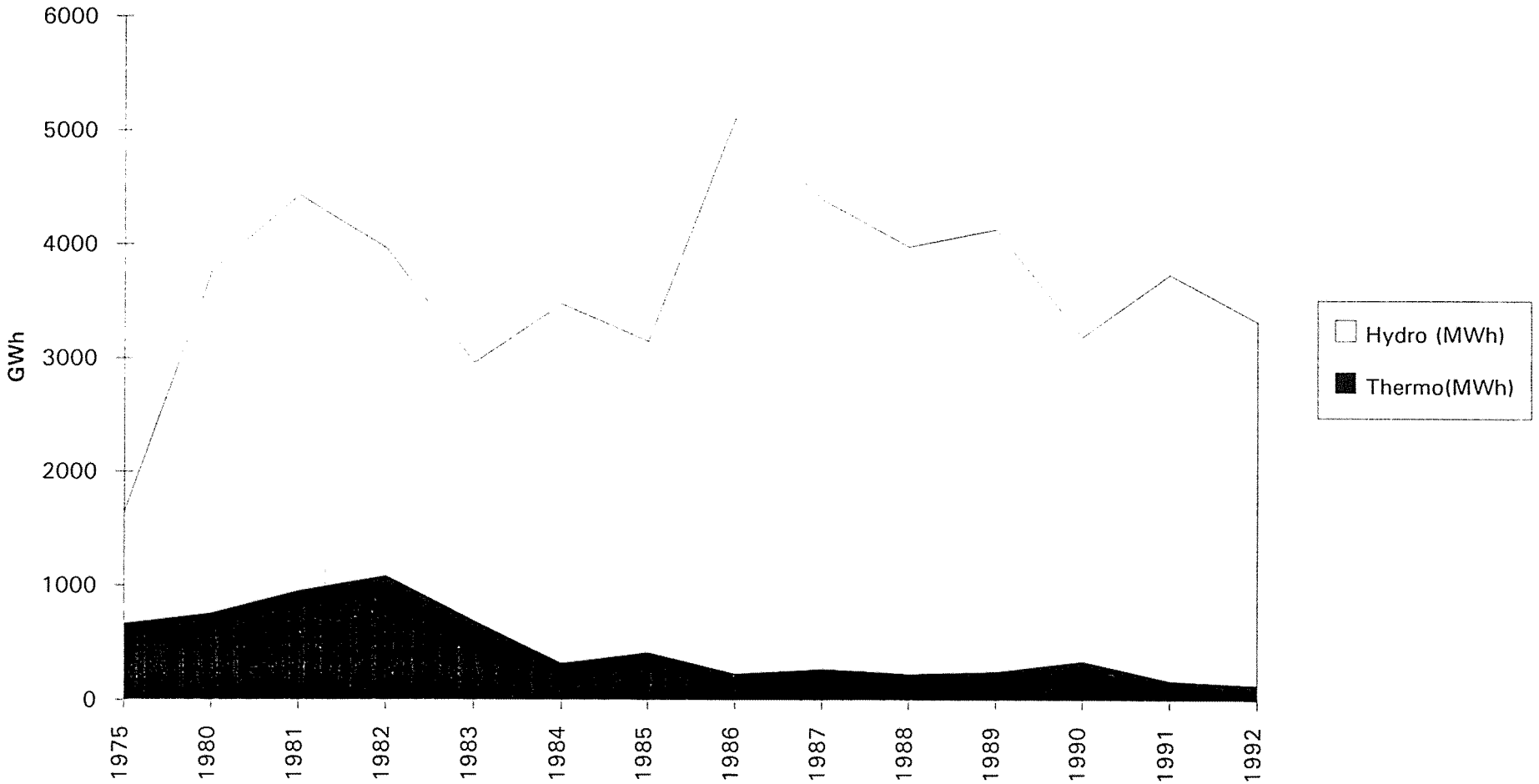
The main feature of this form of organization is that, at least theoretically, creates the bases for market competition in the generation side and also the possibility to introduce a price structure such that push the companies participating in the market to rise their efficiency.
The reform is going to touch also the **distribution sector of the market.** Forming separate distribution companies in different regions will be relatively easy because they exist in some similar form.
The situation of the sector at the moment is really poor.
The distribution companies have billed a very poor 50% of the electricity they supply and collecting money for even less of the total electricity supplied. This, as already explained before is due to the lack of metering devices to a considerable part of their costumers.
Also, the technical situation of the distribution network is really bad. This is due to the boom of the households consumption and the total absence of investments to upgrade the distribution network to this increased demand.
Both the problems touched in the previous paragraphs could be solved only with considerable amounts of investments in the networks and in metering devices to the consumer.
The A.E.C. is negotiating with the World Bank about a loan that will be used to solve the problems of the distribution companies.
Probably a distribution sector under a vertically integrated A.E.C. will give more guaranties to the World Bank if

confronted with the situation of a big number of separated distribution companies.
But on the other side, these separated distribution companies, if given the proper incentives could act very effectively in reducing the non-technical losses.(the grid company could apply different bonuses or penalties related to the performance of the distribution company regarding the level of non-technical losses). The results in this direction could be even greater if the companies will be privatized totally or partially.
There exists a way in between the two already mentioned before. The distribution companies could remain as they are under the jurisdiction of the A.E.C. and in the same time they could subcontract the electricity sale to some small retail sale companies privately owned. To these retail companies should be applied the same schemes of tariffs so that, they could have incentives to improve their financial result through the improvement of the technical result(the reduction of the non-technical losses should be accompanied by some bonuses in the tariffs applied by the distribution company to the retail company).

A P P E N D I X

	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Thermo(MWh)	672	763	957	1085	696	321	416	233	273	231	250	341	168.5	130.2
	(40,7%)	(20,2%)	(21,6%)	(27,4%)	(23,5%)	(9,2%)	(13,1%)	(4,6%)	(6,2%)	(5,8%)	(6,4%)	(10,7%)	(4,5%)	(3,9%)
Hydro (MWh)	976	3004	3477	2880	2266	3156	2731	4874	4120	3751	3885	2848	3567	3191
	(59,3%)	(79,8%)	(78,4%)	(72,6%)	(76,5%)	(90,8%)	(86,9%)	(95,4%)	(93,8%)	(94,2%)	(93,6%)	(89,3%)	(95,5%)	(96,1%)
Total Generation(MWh)	1648	3767	4434	3965	2962	3477	3157	5107	4393	3982	4135	3190	3735	3321
Self Consumption(MWh)	n.a.	n.a.	103,1	111,8	87,7	67,9	73	62,8	68,2	69,8	74	79,6	55,3	43,9
Transmission losses(MWh)	n.a.	n.a.	251,4	200,5	184,6	217	217	331,2	299,4	325,1	306,3	315,1	285,4	327,3
Distribution Losses(MWh)	n.a.	n.a.	84,4	92,1	101,2	111,2	111,2	123,7	142,1	148,9	162,7	217,9	400,6	768,6
Export (MWh)	366	1223	1783	1256	430	758	652	2093	1423	736	629	118	567,9	560
Import(MWh)	0	0	0	0	0	0	112,4	0	166,6	182,9	147	559,1	157,2	0
Total domestic consumption	1031	2161	2200	2291	2163	2325	2108	2501	2629	2885	3002	2828	2169	1621
Agricultural consumption(MWh)	68	160	188	213	171	226	222	262	304	333	325	333	n.a.	n.a.
	(6,8%)	(7,4%)	(8,5%)	(9,3%)	(7,9%)	(9,7%)	(10,5%)	(10,4%)	((11,6%)	(11,5%)	(10,8%)	(11,3%)		
Households consumption(MWh)	110	136	151	161	165	187	193	215	233	250	271	280	n.a.	n.a.
	(10,7%)	(6,3%)	(6,8%)	(7,0%)	(7,6%)	(8,0%)	(9,1%)	(8,6%)	(8,6%)	(8,7%)	(9,3%)	(9,9%)		
Industrial consumption(MWh)	740	1679	1675	1735	1648	1727	1552	1815	1854	2034	2149	1944	n.a.	n.a.
	(71,8%)	(77,7%)	(76,0%)	(75,0%)	(76,0%)	(74,0%)	(73,6%)	(72,5%)	(70,5%)	(70,5%)	(71,6%)	(68,7%)		
Other consumption(MWh)	113	196	176	182	169	185	141	209	230	268	257	271	n.a.	n.a.
	(10,9%)	(9,0%)	(8,0%)	(7,9%)	(7,8%)	(7,9%)	(6,6%)	(8,3%)	(8,7%)	(9,2%)	(8,6%)	(9,5%)		

Chart showing the sources of electricity production in Albania during the period 1975-1992



NAME OF THE ENTITY	Power suplied to the entity GWh	Sold to consumers Domestic GWh	Non-Domestic GWh	Total GWh	Distribution losses %	Number of consumers Domestic units	Non-Domestic units	Total units	Ave per Dom Consumer Supplied	Billed	Number of Personel units
TROPOJE	24.3	4.1	13.2	17.2	29.1	7946	100	8046	723	513	150
KUKES	36	8.3	19.8	28.2	21.8	11990	400	12390	1024	696	155
KOPLIK						8450	440	8890			100
KRUME						3370	64	3434			45
SHKODER	214.2	33.7	41.4	75.1	65	35180	1820	37000	3398	957	300
PUKE	23.6	3.7	13.9	17.6	25.3	7840	370	8210	710	470	120
NORTH	**298.1**	**49.8**	**88.3**	**138.1**		**74776**	**3194**	**77970**			**870**
BULQIZE						9350	750	10100			120
DIBER	64.3	14.4	39.3	53.7	16.6	17848	1200	19048	1112	807	210
MIRDITE	38.7	4.6	25.6	30.1	22.1	8179	203	8382	985	558	100
MAT	106.6	7.6	89.5	97.1	8.9	12405	220	12625	795	613	160
NORTH EAST	**209.6**	**26.6**	**154.4**	**180.9**		**47782**	**2373**	**50155**			**590**
TIRANE Fshat	82.6	12.2	56.1	68.3	17.3	19232	305	19537	842	636	175
TIRANE Qytet	299.7	87	83.2	170.2	43.2	67400	11200	78600	2370	1291	470
KRUJE	44.7	6.9	20.2	27.1	39.4	9532	408	9940	1599	726	90
LAC	37.6	5.6	17.8	23.4	37.7	10365	235	10600	951	540	100
LEZHE	43.8	7.3	20.7	28	36	11433	320	11753	1015	641	135
DURRES	171.5	31.2	84.4	115.6	32.6	36000	810	36810	1608	867	200
KAVAJE	54.8	11.2	17.7	28.9	47.3	14190	180	14370	1550	791	115
WEST CENTRAL	**734.7**	**161.4**	**300.1**	**461.5**		**168152**	**13458**	**181610**			**1285**
ELBASAN	159.6	30.1	66.9	97	39.2	49380	2630	52010	1129	609	305
LIBRAZHD	20.6	5.5	11.2	16.7	18.8	11713	275	11988	605	472	135
GRAMSH	10	4.1	4.9	9	9.7	7455	367	7822	611	550	80
EASTERN CENTRAL	**190.2**	**39.7**	**83**	**122.7**		**68548**	**3272**	**71820**			**520**
LUSHNJE	76	19.3	27.6	46.9	38.3	30969	713	31682	1027	622	155
FIER	115.3	40	44	84	27.1	53146	2482	55628	1133	753	260
VLORE	130.4	29	39.3	68.3	47.6	35260	1075	36355	1932	822	230
TEPELENE	24.7	6.3	12	18.3	25.9	8545	470	9015	991	735	90
SOUTH WEST	**346.4**	**94.6**	**122.9**	**217.5**		**127920**	**4740**	**132680**			**735**
POGRADEC	35	8.7	17.2	25.9	25.9	15900	555	16455	824	547	100
KORCE	116.3	31.3	38.2	69.5	40.3	43005	1440	44445	1276	727	260
KOLÖNJE	8.4	3.3	3.2	6.5	22.6	4831	211	5042	910	689	70
SOUTH EAST	**159.7**	**43.3**	**58.6**	**101.9**		**63736**	**2206**	**65942**			**430**
SKRAPAR	16.4	5.4	7.8	13.3	19	9434	308	9742	742	577	95
GJIROKASTER	34.8	15.1	12.2	27.4	21.3	13827	761	14588	1391	1095	130
SARANDE	37.5	16.5	13.4	29.9	20.1	21150	640	21790	980	782	155
KUCOVE						7515	290	7805			
BERAT	88.8	21.9	34.4	56.3	36.6	27885	900	28785	1404	787	205
PERMET	12.7	4.6	5.2	9.8	22.8	7796	401	8197	771	596	75
SOUTH	**190.2**	**63.5**	**73**	**136.7**		**87607**	**3300**	**90907**			**660**
TOTAL	***2128.9***	***479.2***	***880.2***	***1359***	***36.1***	***638521***	***32543***	***671064***	***1331***	***750***	***5090***

Table with the data regarding the distribution part of the market

ASSETS & EMPLOYMENT IN EACH BRANCH OF THE POWER INDUSTRY				
	ASSETS(MIO Lek)		*EMPLOYMENT*	
STEAM PRODUCTION	1000	12.60%	1482	15.60%
HYDRO *	3659	53.20%	682	8.50%
THERMO *	650	9.30%	747	9.30%
GENERATION(hydro + thermo) *	4309	62.50%	1429	17.80%
TRANSMISSION *	830	11.50%	959	11.45%
DISTRIBUTION *	1302	18.60%	5090	64.20%
ADMINISTRATION & R&D *	522	7.40%	540	6.55%
ELECTRICITY PRODUCTION	6963	87.40%	8018	84.40%
Total A.E.C.	7963		9500	
* -percentage to the total of electricity production				

REVENUE (in MIO of LEK)	1992		1993*	
Revenue from Retail sale of Electricity	1496	41.50%	2520	60.90%
Revenue from Export of Electricity	1384	38.40%	560	13.50%
Revenue from Sale of Steam	650	18.00%	947	22.90%
	72	2.00%	108	2.60%
TOTAL REVENUE	3602		4135	
EXPENDITURE (in MIO of LEK)				
PRODUCTION AND SUPPLY OF ELECTRICITY				
Salaries and Wages	211	28.20%	337	26.20%
Purchase of Electricity	0	0%	0	0%
Fuel costs	238	31.80%	464	36.00%
Material and other expenditure	160	21.40%	128	10.00%
Administration and General expenditure	0	0%	128	10.00%
Depreciation	140	18.70%	229	17.80%
TOTAL PRODUCTION AND SUPPLY OF ELECTRICITY	748		1286	
Salaries and Wages	40	6.30%	63	5%
Fuel costs	518	77.30%	1002	80.80%
Material and other expenditure	91	13.60%	73	5.90%
Administration and General expenditure	0	0%	73	5.90%
Depreciation	19	2.80%	30	2.30%
TOTAL PRODUCTION OF STEAM AND OTHER OPER	668		1241	
OPERATING EXPENDITURE	1416		2528	
Export Tax	62		112	
Excise Tax on sale of Electricity	643		910	
Excise Tax on sale of Steam	0		0	
TOTAL TAXES	706		1022	
TOTAL EXPENDITURE BEFORE INTEREST	2121		3550	
OPERATING INCOME	1481		585	
Interest charge to operations	0		0	
PROFIT BEFORE TAX	1481		585	
# The figures for 1993 are A.E.C. estimates				

Some comments on the balance sheet for 1992

On the revenue sides shown as gross revenue including the export and excise taxes respectively on export and non-domestic sales. Furthermore the figures shown are revenue "billed" rather than revenue "collected".(The revenue collected was about 84% of the revenue billed in 1992 , the difference adding to the balance of debtors)
Based on a total electricity export of 560 GWh in 1992 , the average gross revenue from energy was 2,5 Lek per kWh exported. Average gross revenue from electricity sales in Albania (1654 GWh , excluding export) was 0.9 Lek per kWh sold .
The big rise in 1993 in the revenue from the sale of electricity in Albania is due partially to the rise in price from 0.5 to 0.8 Lek / kWh for domestic consumers (with higher rates for consumers exceeding the monthly consumption of 250 kWh) and from 1.8 to 2 Lek/kWh for non-domestic consumers, and partially to the increased internal consumption.
Revenue from the sales of steam was 650 MIO Lek i.e. 18% of KESH's gross revenue or 22% of the net revenue (after export and excise tax.)
What one can depict easy on the expenditure side of the Balance sheet of KESH is the very low capital charges(no interest charges, low level of depreciation charges based on undervalued assets) and the low level of personnel and maintenance expenditure. The expenditure is thus dominated by the fuel costs (which prices reflect the international price levels)So the fuel cost - 756 Mio Lek in 1992- thus account for 52% of the total operating expenditure in that year .The 238 Mio Lek in 1992 and 464 Mio Lek in 1993 i.e. the fuel cost for the production and supply of the electricity in the respective years account respectively for 32% and 36% in the total of costs for production and distribution.
According to the balance sheet the steam production made a small profit in 1992 (a revenue of 722 Mio Lek against operating expenditure of 668 Mio Lek).
On the othe hand , electricity production - in spite of the high level of taxation and in spite of the high level of energy losses- shows considerable profit(net revenue after export and excise tax of 2174 Mio Lek against an operating expenditure of 748 Mio Lek i.e. a gross profit of the electricity sector of 1426 Mio Lek)
Furthermore in explaining the Balance Sheet should be noted that in 1992 the revenue from exports was 60% of the total revenue while in terms of energy exports accounted only for 25%.

Let us now make some calculation of costs of electricity produced in the two kinds of plants the A.E.C. possesses, using data from the A.E.C. projections for the balance sheet for 1993.

APROXIMATION OF COSTS OF THERMO-GENERATED ELECTRICITY						
		total		*hydro*		*thermo*
Operating expenditure						
salaries and wages	MIO Lek	60	*x Kh1*	28,65	*x Kt1*	31,34
purchase of energy	MIO Lek	0	*x Kh2*	0	*x Kt2*	0
Fuel costs	MIO Lek	464	*x Kh3*	0	*x Kt3*	464
Material and other expenditure	MIO Lek	80	*x Kh4*	68,1	*x Kt4*	11,9
administration and general expenditure	MIO Lek	22,8	*x Kh5*	10,9	*x Kt5*	11,9
Depreciation	MIO Lek	143	*x Kh6*	121,8	*x Kt6*	21,3
Total operating expenditure	MIO Lek	769,8		229,45		540,44
Electricity generated by each source	GWh	3384		3250		134 #
Costs of electricity in thermo & hydro plants	Lek/kWh	0,2275		0,706		4,033

- we compute the net electricity produced that is we subtract from the electricity produced by the thermo- plants the internal consumption. So from a total production of **180 GWh** we subtract the internal consumption of **40GWh** and we get the **net output electricity of 140 GWh.**

- Where coefficients Kh_1 to Kh_6 are the weights of the hydro capacities and kt_1 to kt_6 are weights of the thermo capacities to the general expenditure of the A.E.C. dedicated to production transmission and distribution of electricity and are calculated as follows:

$$kh_1 \equiv \frac{number \cdot of \cdot staf \cdot in \cdot hydropowerplants}{total \cdot number \cdot of \cdot employes} \equiv \frac{682}{8018} \equiv 0,085$$

$$kh_2 \equiv 0$$

$$kh_3 \equiv 0$$

$$kh_4 \equiv \frac{Total \cdot of \cdot hydro \cdot assets}{total \cdot of \cdot fixed \cdot assets \cdot in \cdot operation} \equiv \frac{3659 MIO \cdot Lek}{6963 MIO \cdot lek} \equiv 0,532$$

$$kh_5 \equiv kh_1$$

$$kh_6 \equiv kh_4$$

$$kt_1 \equiv \frac{number \cdot of \cdot staff \cdot in \cdot thermopowerplants}{total \cdot number \cdot of \cdot employes \cdot in \cdot electricity \cdot sector} \equiv \frac{747}{8018} \equiv ,093$$

$$kt_2 \equiv 0$$

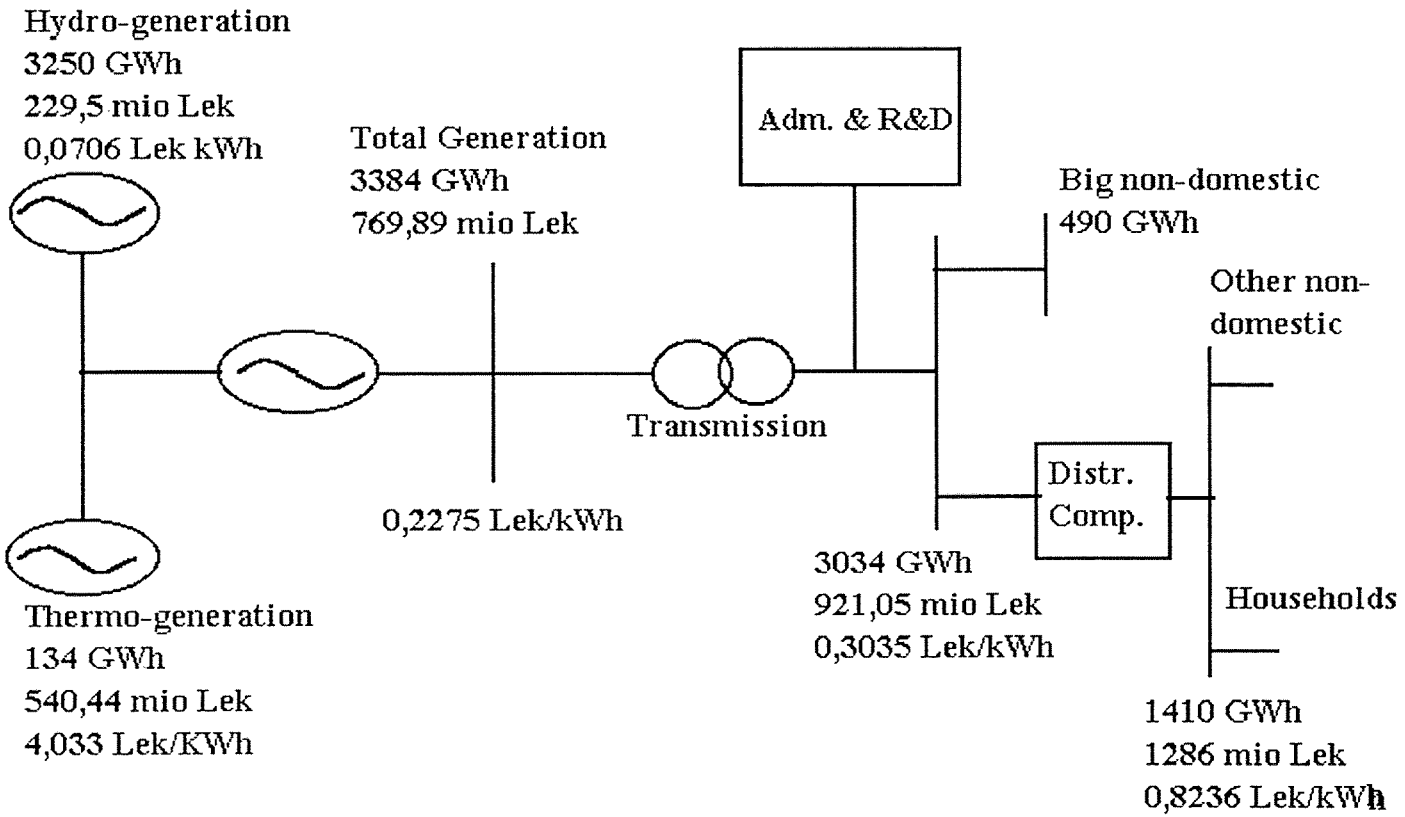
$$kt_3 \equiv 1$$

$$kt_4 \equiv \frac{thermo \cdot assets \cdot used \cdot for \cdot elesticity \cdot production}{total \cdot of \cdot fixed \cdot assets \cdot in \cdot operation} \equiv \frac{650}{6933} = ,093$$

$$kt_5 = kt_1$$

$$kt_6 = kt_4$$

A BREAK DOWN OF THE EXPENDITURE IN THE BRANCHES OF THE POWER INDUSTRY							
(MIO Leks)	*HYDRO*	*THERMO*	*GENERATION*	*TRANSM*	*ADM. & R & D*	*DISTRIB.*	*TOTAL*
Salaries & Wages	28,65(12,5%)	31,34(5,7%)	60(7,8%)	38,6(40,9)	22,06(38,7%)	216,35(59,3%)	337(26,2%)
Net Imports	0	0	0	0	0	0	0
Fuel Costs	0	464(86%)	464(60,3%)	0	0	0	464(36,1%)
Material & other expenditure	68,1(29,7%)	11,9(2,2%)	80(10,3%)	14,7(15,6%)	9,5(15,6%)	23,8(6,3%)	128(9,8%)
Administration & general expenditure	10,9(4,7%)	11,9(2,,2%)	22,8(2,9%)	14,6(15,4%)	8,4(144,7%)	82,2(22,5%)	128(9,8%)
Depreciation	121,8(53,,1%)	21,3(21,3%)	143,1(18,6%)	26,36(18%)	16,94(29,8%)	42,6(11,7%)	128(9,8%)
TOTAL	229.45	540.44	769.89	94.26	56.9	364.95	1286
Electricity output for each stage(GWh)	3250	134	3384	3034	3034	1410 **	1900
Losses expresed in monetary terms(MioLek)	-	-	-	79.6	-	368.45	
Losses component of costs in every stage(Lek/KWh)	-	-	-	0.0262	-	0.2613	
Expenditure component of costs(Lek/KWh)	0.0706	4.033	0.2275	0.0311	0.0187	0.2588	
Costs in every stage of the industry(Lek/kWh)	0.0706	4.033	0.2275	0.2848	0.3035	0.8236	0.6768
*** - 490 MWh are sold directly in high voltage level by the production companies*							



PICTURE OF THE COST FORMATION PROCES IN THE POWER INDUSTRY

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