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CURRENT STATE OF ESTONIAN INDUSTRY

**The basic material prepared in autumn 1993
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"The Future of Estonian industry"**

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I. INTRODUCTION

This paper contains the bulk of the material prepared by the representatives of the Institute of Economics of the Estonian Academy of Sciences for a study on "The Future of the Estonian Industry". The project was carried out jointly by the Institute of Economics and Etlatieto OY from Finland. Most of the material has been written by Kaarel Kilvits. Information compiled in this paper was used as background material when writing the above-mentioned study published under the title "Emerging Estonian Industrial Transformation - Towards a Dual Strategy" in May 1994. The separate publishing of this material have been regarded as appropriate because it contains a lot of valuable information and assessments that have been impossible to include in the final report of the study. In general this paper contains information and evaluations of the state of the Estonian industry by branches from the end of the Soviet era to mid-1993. In addition some other more general aspects of the Estonian economy are also covered.

II. STRUCTURE AND ORGANIZATION OF PRODUCTION

II.1. Roots of inappropriate structure of industry

Before the Second World War the Estonian industry satisfied by its structure the needs of a small independent country and was quite competitive in international trade. The Estonian and Finnish industries were more or less on the same level.

After the incorporation of Estonia into the Soviet Union in 1940 the industry was nationalized and a planned economy introduced. The war that broke out shortly after that caused great destructions to the Estonian industry. Many enterprises were destroyed completely or partly.

The extensive development of the Estonian industry that started after the Second World War was obviously caused by various intertwined goals, reasons and circumstances.

1. Creation of new industrial enterprises and extension of the existing ones enabled to create new jobs and thus had a share in carrying out the most important strategic goal of Moscow - russification - by way of organized importation of labour. The changing of the economic structure and national composition of the employees enabled to create the so-called civil garrisons and ensure with that the annexation of Estonia to Russia. For the sake of this goal the Estonian industry was integrated into "the unitary economic complex of the Soviet Union" and made dependent on it.

2. However, it is necessary to take into consideration that the forced development of the Estonian industry was not a unique undertaking in the Soviet Union then. An industrialization campaign was in progress (continued) in the whole country. A solemn belief in the rightness of the priority development of the production of means of production (heavy industry) was predominating. New manufacturing enterprises were set up and the existing ones extended all over the Soviet Union. Therefore many of the direct executors of the Soviet Union industrial policy in the Central Committee of the Estonian Communist Party, in the Estonian SSR government and

elsewhere may not have been conscious of all political and strategic goals and consequences at all.

3. In Estonia it was possible to make investments much more effectively than in most other regions of the Soviet Union. In Estonia, there was an industry of quite satisfactory level and relatively educated working class, historical traditions, infrastructure that could be made use of, thanks to the Estonian agriculture (where the production had, however, considerably declined by that time as compared with the pre-war period) foodstuffs sufficed for feeding industrial workers, etc.

4. Estonia had an important energy resource - oil shale. The forced development of industry was also fostered by the availability of forest resources and a possibility to produce building materials (there were both natural building materials and brickyards, production of cement, etc.).

5. Favorable economic-geographical position made it possible to develop so-called maritime branches of economy in Estonia: sea transport, fish industry, ship repair industry.

6. The majority of the German equipment dismantled for the reparations were transported to the Soviet Union by sea through the port of Tallinn. Since the transport worked very badly and equipment tended to accumulate in the port, it was often easier to make use of them in Estonia.

Mostly just for the above-mentioned reasons extensive investments were made in the Estonian industry in the post-war period (during 1945-1989 over 7.8 billion roubles at comparable prices of 1989). But it doesn't mean that these investments were made at the expense of other Union republics or some mystical "center". Most of the post-war investments into Estonian industry were made clearly from the reparation payments. Approximate calculations allow to state that the amortization of the fixed assets for renovation and investments in the Estonian industry were about equal in this period. It should be taken into consideration that the profit (as well as other monetary resources) was taken into the centralized funds and only part of it was returned. Selective analysis allows one to say that the Estonian industry received in most of the post-war years less from the budget than contributed there.

Industrialization in Estonia was carried out according to the previous practice of the Soviet Union, which meant the demolition of most of the existing structures and disruption of natural self-regulation in the economy. It was accompanied by structural shifts, social, demographic and ecological consequences. It is conspicuous that investments were made primarily in branches oriented to the consumers outside the republic (Soviet Union market).

The central power in Moscow tried in every way to reduce the significance of a Union republic as a whole. Everybody were made dependent on others by downright nonsensical specialization, extension of cooperation relations, location of production, procurement of raw materials, etc.. For instance, Uzbekistan, the biggest cotton producer, who had a lot of free labour power, was hindered in every way from extending its cotton industry. Instead the cotton industry was extended in Estonia, who was suffering from the shortage of labour power. Since nobody had heard anything about direct contacts between Union republics, this kind of industrial policy of the Soviet Union enabled to increase the dependence of both republics on Moscow.

Uzbekistan could realize its cotton only to Moscow and Estonia could buy (request for the allocation) only from Moscow. This enabled the Moscow central authorities to have full control over the industry in Union republics and frame it according to its own interests.

For the above-mentioned reasons and also due to the absurd, artificial price formation principally different from that of the rest of the world a rather peculiar structure of industry was formed in Estonia (as well as in the whole Soviet Union).

Since the prices of raw materials and energy carriers were artificially low in the Soviet Union at that time, the whole industrial production was highly raw material, energy and transport intensive. Thanks to the enormous market of the Soviet Union as a relatively closed system this kind of industrial production did not have to consider the world market competition.

The structure of Estonian industry was not based on inner development logic but rather on the policy "distribute and rule" by Moscow. The Estonian industry was in essence only the complex of individual manufacturing enterprises located on the territory of Estonia, among whom many were factually departments-subsidiaries of Russian firms. This kind of industrial structure quite satisfied the interests of Moscow and in the economic environment of that time could be considered even logical and effective.

The industrial structure resulted from the post-war development reached its hey-day (maximum volume of production) in 1989. But it must be taken into consideration here that in the case of many individual kinds of products this year was anything but peak year. For example, oil shale production had declined from 32.8 to 23.3 million tons, output of electric motors from 309.6 to 215.3 thous. pieces, production of mineral fertilizers from 267.9 to 214.0 thous. tons, etc.. But industrial output as a whole was in this year really bigger than in the previous years.

11.2. The structure of Estonian industry in 1989

It is obviously expedient to discuss the industrial structure in Estonia in the year of maximum volume of production to find out production capacities, potentials, etc.

In this section we try to give a survey of the industrial structure of the peak year of the old economic system without large tables and detailed statistics, drawing attention only to the most essential problems. This kind of discussion may be explained by two facts. First, the year 1989 is the economic history in our rapidly changing situation and does not need to be discussed so thoroughly from the viewpoint of planning the future of the Estonian industry. Secondly, many statistical data on 1989 will be produced in the sections below with a view to showing the dynamics, trends and potentials of the current processes.

To characterize the industrial structure of Estonia in 1989, we have only the statistics of that time at our disposal, which did not include many big defense industry enterprises: Dvigatel, Baltijets, Sillamäe Chemical-Metallurgical Combine, Factory No 7, etc. Obtaining information on these enterprises was extremely difficult or quite impossible.

In 1989 manufacturing was clearly the most important branch of economy in Estonia. 60.2% of the GDP and 44.2% of the national income was created there. In Estonian industry there were 3567 enterprises in all, who employed 245755 people and productive fixed assets for 5540900 thous. roubles. Commodity production was 6678431 thous. roubles in this year. Main production capacities were, however, accumulated in 284 large enterprises, which employed 78.9% of the working population and 82.9% of the productive fixed assets and which produced 84.7% of the commodity production.

Unfortunately accounting, data processing and generalization were incomplete also as regards industrial cooperatives and small enterprises created in 1985-1989. It is only known that at the end of 1989 471 cooperatives and 62 small enterprises said to be engaged in manufacturing in Estonia. They had respectively 9449 (4632 in their second employment) and 1717 employees (32.2% of the wages received for second employment). Productive fixed assets of cooperatives were mostly leased, those of small enterprises cost 23486.4 thous. roubles at the end of 1989. Commodity production by cooperatives and small enterprises was 31773.4 and 35787.7 thous. roubles respectively in 1989. As you can see, cooperatives and small enterprises accounted for about 1% of the Estonian industrial production in 1989.

In 1989 the management of the Estonian industry was within the competence of both the Soviet Union central government and the Estonian SSR government. Manufacturing was planned and managed by all-Union, Union-republican and republican ministries and institutions formed by the branch principle.

Based on that the Estonian industry may be discussed as consisting from Union subordinated, Union-republican subordinated and republican subordinated industry (Table 1). As you can see from Table, 58 major industrial enterprises were under the direct administration of Moscow. These enterprises employed 59.2% of the productive fixed assets of the Estonian industry.

As for the branch division of industry, almost a quarter of the industrial fixed assets were thanks to the high cost of the Baltic and Estonian Thermal Power Plants employed in power engineering. The number of employees was the biggest in engineering and metal industry. The role of chemical industry was also remarkable in the industrial structure - it occupied the third place by the cost of fixed assets after power engineering and metal industry.

In 1989 the production of means of production (A-group) accounted for 56.2% of the Estonian industrial production.

The industrial structure formed as a result of the whole post-war development was not favorable from the territorial aspect either. In 1989 about two third of the Estonian industry was concentrated in three North-Estonian towns: Tallinn, Kohtla-Järve and Narva (71.5% of the productive fixed assets, 66.8% of the industrial employees and 64.7% of the commodity production).

Narva contributed the biggest part - 81.2% - of the energy production (thanks to the Baltic and Estonian Thermal Power Plants), Kohtla-Järve of the fuel production - 86.1% (thanks to oil shale mining). Kohtla-Järve also contributed a big part of the chemical industry production - 49.7%. In engineering and metal industry the leading position was occupied by Tallinn - 66.0%. In other industries the territorial division was more even.

Table 1. Subordination of Estonian main industries in 1989

	Number of enterprises	Productive fixed assets, thous. roubles (%)	Number of employees, (%)	Commodity production thous. roubles (%)
Total industry	284	4595484 (100.0)	193927 (100.0)	5658606 (100.0)
among this				
Union subordinated industry	58	2720435 (59.2)	65867 (34.0)	1650080 (29.2)
Union-republica subordinated industry	137	1046637 (22.8)	58570 (30.2)	2019895 (35.7)
Republican subordinated industry	89	828412 (18.0)	69490 (35.8)	1988631 (35.1)

The technical level of the Estonian industry was clearly unsatisfactory in 1989. Unfortunately detailed results are available only for 1985, when the depreciation of productive fixed assets was 47.3% (in building materials industry 53.8% even). Indirect calculations show that in 1989 the depreciation of productive fixed assets was about 52.3% in Estonian industry. In 1985 27.6% and in 1989 about 25.0% of the industrial workers were occupied with primitive manual labour.

On the strength of the facts above we can draw a conclusion that in 1989 Estonian industry reached its maximum volume of production, but its structure and technical level evidenced serious internal tensions and development problems. It was obvious that the existing system had exhausted itself in every respect. Further evolutionary development was impossible. Revolutionary changes were imperative.

II.3. Structural crisis in Estonian industry

The structure of Estonian industry described shortly above (which was formed by 1989) could in itself be quite logical and acceptable system for Moscow central power under the conditions of the economic system in the Soviet Union at that time. But such structure of industry did in no way serve the needs of the newly independent Republic of Estonia, who started to return from planned economy to a market economy. Enormous amount of investments were made for creating existing production capacities, but their structure and technical level were such as in many cases it would have been more correct to speak about the cost of liquidation.

And the year 1989 remained the peak year of the old economic system. During the next two years (1990, 1991) a considerable decline in output level occurred and a real structural crisis in the Estonian industry started in 1992.

This structural crisis in the Estonian industry can be regarded as an objective phenomenon. Several factors changing the structure worked in parallel (many-fold rise in the prices of fuels

and raw materials, disorder in banking transactions, decline in the purchasing power of the domestic market after the monetary reform, etc.).

Sharp decline in the Estonian industry in 1992 was greatly due to its openness towards east. Since the Estonian industry was (and still is) energy and raw material intensive, the decline in their import from the east caused both directly and indirectly a considerable decline. The effect of the collapse of eastern trade was expressed sharply in the second quarter of 1992 - when the previously obtained raw materials run short.

The Estonian industry, which had previously produced for the Eastern market based on the plans confirmed by Moscow, found itself in quite new conditions. If previously the management of enterprises had to solve mainly production-technical and supply problems, then now the main issue was: what to produce and for which market. After the considerable decline in orders from Russia the Estonian engineering and metal industry fulfills suborders of Western firms, chemical industry enterprises work only at half load, practically all industries and individual enterprises have some difficulties.

The operation of many enterprises has been restricted by the shortage of circulating media.

The production of building materials industry (excl. cement) is realized mainly in the local market. Since the construction volumes have considerably declined, its logical result is also the decline in the production of building materials industry.

The decline in the production of food industry is due to the competition from imported food and lessening of the raw materials procured from agriculture (decline in agricultural production). Due to the high processing costs in meat processing and dairy plants and the monopolistic price formation, high taxes and mark-up prices most of the agricultural production is sold directly by agricultural producers in the market-place or behind the doors of the shops, either in prefabricated form or raw.

The decline in the output level of concentrated fodder industry is resulted from the decline in the number of livestock, high prices of concentrated fodder and the fact that farmers produce fodder themselves from left-over grain.

The sewing industry is the only industry which has, thanks to the Western orders, managed to become stabilized.

In the initial period of the structural crisis, until the middle of 1992, there were mainly declines in output levels. Since the number of employees dropped as compared with production three times slower, the labor productivity declined. It was obvious that such development cannot last. Then started the termination or suspension of productions (along with sending employees on compulsory leave). Based on the enacted bankrupt law the first bankruptcies occurred.

The structural crisis in Estonian industry continues also in 1993. In January-June the output of industry was 6890.1 million kroons at current selling prices (excluding sale and excise tax). State and municipal enterprises contributed from this 4397.5 million kroons or 64%. As compared with the same period in previous year the industrial output decreased 34.7%, from

this that of state and municipal enterprises 36.3%. From these 167 enterprises 137 (82.0%) reduced their output.

The author considers it necessary to emphasize once more that it is a quite objective process. For example, in Latvia and Lithuania the decline is even bigger (output level in January-June, 1993 55.4% and 48.2% respectively compared with January-June, 1992). Other post-socialist countries also experience great decline in industrial production.

It is bad that means of production of many manufacturing enterprises of Estonia are not renewed while they continue to drop out. Since the price of productive fixed assets is artificially low the amortization is also small and does not cover actual costs. And even these unreasonably low sums are not often used purposefully. Many industrial enterprises have not made investments for a long time. Their activity has been aimed at postponing bankruptcy. They sell their fixed and current assets and lease production space in order to pay debts, (excessively high) wages, costs of (frequent and unreasonable) business trips (of the administration) abroad. The firms are eating themselves away.

The decline of the Estonian industry is, of course, enormous, per capita output has decreased (Table 1) and there are many problems. But the situation should not be overdramatized. While comparing the present production volumes with the previous years it should be considered that then the production indicators were greatly increased artificially by means of iterative accounting, price manipulations, etc. Today there simply is no reason for such operations.

The development in recent months shows that the Estonian industry starts gradually to be stabilized. At the same time, under stabilization should not be meant the restoration of previous output level destined for the Eastern market but stopping the decline of production and formation of the industrial structure suitable for the Republic of Estonia.

Table 1. Industrial output per capita in 1989-1992

	1989	1990	1991	1992
Electric energy, kwh	11163	10858	9339	7547
Mineral fertilizers (recalculated to the 100 % content of agent), kg	135.6	136.2	115.2	38.2
Paper, kg	58.2	48.9	49.5	21.9
Cement, kg	715.9	592.8	577.8	308.3
Cotton cloth, m ²	118.8	106.9	106.9	70.6
Linen cloth, m ²	7.2	6.6	6.5	3.1
Knitwear, pcs	15.0	14.5	14.3	10.0
Leather footwear, pairs	4.5	4.6	4.0	
Preserves, standard tins	225.3	205.0	167.9	77.2
Meat (including subproducts of 1 category), kg	118.3	101.0	81.9	51.8
Whole milk products (recalculated into milk), kg	263.9	260.4	189.1	94.5
Butter, kg	19.8	18.6	18.1	16.8
Fish and other sea products, kg	254.6	233.9	202.7	

After the decline in industrial output by 17.2% in February 1993 (partly on account of the short month) the Estonian industrial output increased four months running. In March the growth was 26.5% (it can be partly ascribed to the long month), in April 5.8%, in May 7.0% and in June 4.9%. In July the industrial output decreased by 6.9%, but this was a usual yearly decline in the period of vacations. Since the statistics does not include about 3700 small-scale productions, among whom many are developing quite fast, the actual growth may be even bigger.

And after all, a considerable part of the economic activity of both Estonia and many other countries takes place in "black market". For instance, Greek economists estimate the turnover of illegal economy at 37% of the official GDP. Approximately half of the employed population have a second, illegal job. The share of illegal production is 20% in Italy, 22% in Portugal, 25% in Spain, 13% in Sweden. The reason is high taxes and short (40 hours) working week, which leaves time for extra work.

The fact that the state is deprived of taxes and the Statistical Office of data is, of course, bad. It is also bad that the enterprises who pay taxes have to compete with those who do not pay taxes. But illegal economy reduces unemployment and stimulates the growth of production.

Since the official statistics does not reflect black market, it provides incorrect picture of the actual development. But opponents of the reforms use these data to compromise innovations and restrain reforms.

Within the first seven months of the year 87.7% of the company income tax planned for 1993 came in to the state budget. Besides, it should be considered that enterprises can show their profit smaller by way of revaluating the fixed assets and increasing depreciation. It is clear that the payment of company income tax gives evidence of the growth of economic activity.

According to the Employment Office, there were officially registered 18646 unemployed persons in Estonia as of August 1. The unemployment level was 2.12% of the population in working age. Within three months (May, June, July) the unemployment level has dropped to 1.64%. In case of good will one can discover from these data first signs of improvement of the economic situation. But it is understandable that in summer the number of jobseekers declines on account of those who have found employment in seasonal jobs, in one's own household or who are on leave. But when autumn comes a rise may be expected in unemployment, because many graduates from secondary and higher schools who were not admitted to schools and have not found a job either, start actively to look for a job through employment offices.

The Estonian industry has unexpectedly fast been able to reorient to the Western market. Only a couple of years ago about 97% of the Estonian trade was with the Soviet Union republics, but in 1992 the CIS states accounted for 35% of the Estonian exports and 40% of imports. In the first half-year of 1993 the share of the CIS countries had dropped to 27% both in exports and imports.

Based on the total foreign trade turnover (sum of exports and imports) the major trade partners of Estonia (by the total foreign trade turnover) in the first half year of 1993 were as follows:

Finland	- EEK 2103.7 million (24.1%)
Russia	- EEK 1743.3 million (19.9%)
Sweden	- EEK 880.0 million (10.1%)
Germany	- EEK 771.8 million (8.8%)
Latvia	- EEK 409.9 million (4.7%)
Netherlands	- EEK 382.6 million (4.4%)
Lithuania	- EEK 235.3 million (2.7%)
Ukraine	- EEK 216.7 million (2.5%)
Denmark	- EEK 209.8 million (2.4%)
Japan	- EEK 208.0 million (2.4%)
USA	- EEK 179.0 million (2.0%)
UK	- EEK 111.3 million (1.3%)

In 1992 and the first quarter of 1993 the trade balance of Estonia with foreign countries was positive (exports exceeded imports by EEK 420.9 million in 1992 and by EEK 60.2 million in the 1 quarter of 1993). But in the second quarter of 1993 the situation changed, and in the first half of 1993 the trade balance was negative (EEK -156.6 million). There is no reason for panic, since according to the methodology, imports include also EEK 141.0 million worth of humanitarian and economic aid to Estonia.

Table 2. Enterprises with foreign capital as of July 1, 1993

	Foreign capital (EEK million.)	Number of enterprises with foreign capital
Total	2241.3	4052
among this		
Sweden	852.1	549
Finland	626.2	1898
CIS	240.3	861
USA	114.1	142
Netherlands	76.8	29
former Yugoslavia	60.1	4
Germany	55.4	170
China	25.2	59
UK	22.0	65
Denmark	17.4	44
Austria	16.3	27
Canada	15.5	26
Switzerland	15.3	28
Italy	15.0	12
Ireland	14.1	15
India	12.0	13
Cyprus	11.3	10
Poland	10.1	35
Norway	6.7	36
France	3.3	15

During a short period of time the Estonian industry has attracted a lot of foreign capital and received foreign aid.

As of July 1993, there were 4052 enterprises with foreign capital participation in Estonia. The total sum of capital invested in them was 6.93 billion kroons, from this foreign capital 2.24 billion kroons (Table 2). Major investors in Estonia are Sweden (38.0%), Finland (27.9%), CIS (10.7%), USA (5.1%), Netherlands (3.4%), former Yugoslavia (2.7%), Germany (2.5%). Major part of the foreign investments are concentrated in Tallinn and Harju county.

So far the most attractive branch for foreign investors has been just industry. Investments there exceed those in wholesale and retail trade as well as transport. In the first half-year of 1993 foreign countries invested in the Estonian industry 194.519 million kroons and 190 enterprises were set up with the help of foreign countries.

Many small enterprises develop quite fast. As of July 15, 1993, there were registered 6975 manufacturing enterprises and 69 enterprises in mining. Only about 4000 enterprises are actually working, from them 2000 with over 20 employees and 2000 with up to 20 employees.

From 297 large-scale enterprises a fifth had found their place under new economic and political conditions. They have not reduced the production compared with the previous year. Let's hope that most of the enterprises presently suffering from economic difficulties will find their place in the new economic system. Some industrial enterprises will inevitably go bankrupt, be liquidated, reorganized, reconstructed. All production capacities created for aiding migration, providing for the Eastern market or simply in megalomania cannot be maintained even in the case of the biggest wish and ingenious industrial policy.

The industrial structure of Estonia should be changed by creating new enterprises on the one hand, and on the other hand, by reprofiling the existing large-scale enterprises - or if it turns out impossible - by liquidating them.

The use of state budget means of the Republic of Estonia for structural political purposes is limited. Therefore the majority of industry is meant to be privatized. At the end of the last year 38 state-owned enterprises were put on international tender. From them 25 are expected to be sold. In May 1993 the next 52 enterprises to be sold were announced. 180 applications were submitted for buying them - 103 from Estonia and 77 from foreign investors. From purchasing bids 26 concerned the shares of enterprises, 76 whole properties and 78 individual units of enterprises. Only one of the enterprises offered for privatization tender did not get a bid, for others the number of bids was between one and ten. The analysis of the bids will be carried out by the Estonian Privatization Agency in the near future, who will also inform which of them are selected by November 5, at latest.

Everything that can be made by private capital should be left to private capital. Success and fast restructuring of industry in Estonia is possible only in case the majority of the property to be privatized will be bought by foreign capital, including by the producer capital with world standard know-how and contacts abroad. In that case it would be possible to use investment requirements and guarantees in the process of selling.

Thanks to the monetary reform and sticking to the recommendations made by IMF, the Republic of Estonia has in short time become fit for investment. The following factors should increase interest of foreign capital in Estonia:

- Contrary to the statements by Moscow, our political situation is stable. Independence was gained without blood.
- We have quite long manufacturing traditions, high educational level, European cultural environment.
- Estonia has a splendid geographical position, good potentials for entering Eastern markets, possibility of sea transport, ship repair and fish industry.
- Low wage level as of yet enables to produce many labour intensive products cheaper than in Western countries and the overvalued kroon promotes export.
- The availability of local building materials, builders and forest conduce to the development of industry.
- Contrary to the previous statements, Estonia is quite rich in natural resources (forest, fish, oil shale, phosphorite, peat, natural building materials, etc.).
- Estonia has industrial infrastructure and there are also vacant production buildings. Therefore, in many cases it is sufficient if to install equipment.
- The Estonian government promotes in every way foreign capital investments in Estonia. Privatization and selling of industry to foreign capital is a part of the government industrial policy. Foreigners can buy also land.

By today a draft law of priority areas in entrepreneurship has been completed, which provides priority areas in foreign trade, export production and entrepreneurship. It has to help to attract foreign investments and promote Estonian industry.

The changing of the industrial structure is also the main goal of Estonian industrial policy. At present it happens mostly by the help of so-called crisis management. The degree of intervention by the government is rather high and it occurs on the microlevel. The disputes are around which firms can be let go bankrupt and which not, how to "drag enterprises along until the privatization" or reorganize them before privatization, how to manage state-owned enterprises better, etc.

After departure from the crisis the moulding of the Estonian industrial development and integration of the Estonian industry into Europe and the world should proceed only with economic methods.

In the next chapters we will discuss the present production structure and organization of Estonian industry based on the most recent statistics and special studies.

Since the paper is about the future of the Estonian industry, we shall use the data of past years only for showing the dynamics of processes under way and to stress that the Estonian industry will be changing fast also in the near future.

11.4. Spheres of activity, their organization and interaction

As a result of the post-war development, based on the "distribute and govern" policy by Moscow (see section 11.1), the Estonian industry was fashioned to be a complex of individual industrial enterprises (among whom many were factually departments-subsidiaries to Russian enterprises) located on the Estonian territory only. Therefore the spheres of activity of the Estonian industry are very divergent and the branch structure variegated and dispersing.

As of July 14, 1993, there were 6975 manufacturing and 69 mining enterprises registered in Estonia. Actually only about 4000 are working, from them 2000 with more than 20 employees and 2000 with up to 20 employees. The Statistical Office managed to get for the analysis of the work results in the first half-year of 1993 information on profit, some financial indicators and assets from 3524 enterprises, which divided by ownership as follows:

- state property 302;
- municipal property 18;
- private property 2209;
- cooperative property 616;
- property of public organizations 12;
- property of leased enterprises 41;
- property of foreign countries 8;
- collective property of Estonian entrepreneurs 35;
- joint property with foreign capital 283.

The latest statistical data on the classification of industrial enterprises by forms of entrepreneurship are from the beginning of 1993, when 1955 enterprises divided as follows:

- private enterprises 41;
- state enterprises 52;
- municipal enterprises 17;
- people's enterprises 4;
- cooperative enterprises 338;
- economic societies 1275;
 - incl. joint-stock companies 1235;
 - from them state-owned joint-stock companies 102;
- leased enterprises 42;
- other forms of entrepreneurship 186;
 - incl. joint ventures 36;
 - small businesses 67;
 - state enterprises who have not changed their entrepreneurship form 76.

Major spheres of activity are as follows.

1. Power engineering. The majority of electric power produced in Estonia comes from two oil-shale heated thermal power plants - Baltic Thermal Power Station and Estonian Thermal Power Station.
2. Fuel industry. The branch consists of oil-shale industry and peat industry.
3. Chemical industry. The branch has a highly diverse structure. There are base chemistry; manufacture of plastic products, glass fibre materials, glass plastics (and products from them); applied chemistry; resin industry; chemical and pharmaceutical industry.
4. Engineering and metal industry. This branch also has a diverse structure. There are manufacture of power engineering equipment; electrical engineering; apparatus building; manufacture of chemical and petrochemical machinery; instrument industry; manufacture of agricultural machinery; general engineering; manufacture of metal products and components; repairs of machinery and equipment (ships, cars, other manufacturing equipment).
5. Forest, wood, pulp and paper industry. The branch consists of forest industry; wood-working industry (furniture industry, ski industry, manufacture of building components from timber and woodboards, manufacture of wooden boxes etc.); pulp and paper industry.
6. Building materials industry. The branch consists of cement industry; manufacture of prefabricated ferroconcrete constructions; manufacture of wall materials; building ceramics industry; manufacture of limestone building materials; glass industry, manufacture of coating materials and hydroinsulators.
7. Light industry. The branch consists of cotton industry; flax industry; wool industry; manufacture of nonwovens; textile and haberdashery industry; stockinet industry; sewing industry; leather, fur and footwear industry.
8. Food industry. The branch consists of bread industry; confectionery industry; fat industry; liqueur and spirits industry; manufacture of refreshing drinks; beer industry; yeast industry; starch and syrup industry; fruit and vegetable industry; tobacco industry; food concentrates manufacturing; meat industry; dairy industry; fish industry; flour and cereals industry.
9. Concentrated fodder industry. The branch consists of grain processing plants (elevators and mills), which produce fodder from grain.
10. Printing industry. The branch consists of large and small printers of various purposes.
11. Other industries. This includes production of art objects; production of musical instruments; jewelry industry etc.

In connection with the structural crisis in Estonian industry, the proportions between spheres of activity are changing continuously, some spheres disappear and new ones arise.

Under the organization of activities we mean mainly the structure of an industry or sub-branch by the number and size of enterprises, their entrepreneurship form, ownership, etc. The relations between specialization and diversification in the spheres of activity are also discussed. The analysis of the interaction of the activities is mostly reduced to studying the clusters.

In many countries the moulding of structural policy has recently proceeded from the concept propagated by Porter that the "bundles" of branches, so-called clusters are successful rather than single branches. (Of course, not branches or their associations in general but enterprises in one or another branch or cluster).

The development of industry in the post-war period signified the destruction of the majority of existing structures and disruption of natural self-regulation in the economy. The Moscow central power tried in every way to reduce the importance of a Union republic as a whole. By quite absurd specialization, extension of cooperation relations, location of production, procurement of raw materials etc. (see section II.1.) the interaction of the spheres of production were to a great extent eliminated in Union republics, including in Estonia. As a consequence of this as well as due to the smallness of Estonia one can speak about the potential clusters only in the following spheres of production.

1. Power engineering - fuel industry (oil shale and peat)
2. Oil-shale chemical industry (oil shale)
3. Forest, wood, pulp and paper industry (forest)
4. Building materials industry (local building materials)
5. Meat, dairy and fish industry (local raw material)
6. Beer industry (partly local barley)
7. Liqueur and spirits industry (partly local grain)

In other spheres of production (especially in chemical industry, engineering and metal industry, light industry), there are mostly enterprises operating alone, independent of others.

In the Finnish economy, which is much bigger than the Estonian, only four clusters are mentioned, and only the cluster of branches connected with forest is considered strong.

Considering everything that has been said above, there is no reason to expect that there will be a cluster with all classical elements (raw material, equipment, research etc.) in Estonian industry.

II.5. *Products*

The most generic picture of the Estonian industrial products (production) is obtained by viewing the dynamics of the production in 1989-1993 (Table 1). The product selection in the table is based on the nomenclature of production studied by the Statistical Office in the first half-year of 1993. As the nomenclature studied in the previous periods has been somewhat different, the data on earlier years are unfortunately incomplete in the table.

The analysis of the table enables to draw the following conclusions.

In producing many products the Estonian industry had gained by 1989 the output level which was awesome even as compared with the most advanced industrial countries. In this year the production of the means of production (group A) accounted for 56.2% and the production of consumer goods (group B) 43.8% of the Estonian industrial output. By output per capita Estonia was among the leaders in the world in producing many kinds of products (electric energy, mineral fertilizers, cement, cotton fabric etc.).

Due to the structural crisis in Estonian industry, the output level has considerably decreased in the ensuing years and the production of many kinds of products stopped altogether. But as you see from the table, the nomenclature of Estonian industrial production was very wide and output levels comparatively big. Potentials for restoring and widening the nomenclature and increasing output are good.

Table I. Dynamic of Estonian industrial production in 1989-1993

Product	Unit of measure	1989	1990	1991	1992	1992 I half year	1993 I half year
Electric power	bill. kWh	17.6	17.2	14.6	11.8	5.85	4.39
Thermal power	thous. MWh					3443	2859
Peat, total	thous.t					389.4	225.8
May-September	"					385.2	224.8
Peat for fuel	"	872	648	574	654	1.0	1.0
Peat for agriculture	"					71.4	50.5
Peat-briquette	"	216	201	195		17.7	18.2
Electrode coke	"					20.0	21.0
Shale oil (commodity)	"					18.1	6.5
Oil for heating (commodity)	"					9.57	7.51
Oil shale	mill.t	23.3	22.5	19.6	18.8		
Mineral fertilizers (re-calculated for 100% active agent content)	thous.t	214	216	181	60	42.1	13.6
among this:							
nitrogen fertilizers	"	108	106			32.4	13.6
phosphate fertilizers (incl. phosphorite meal)	"	106	100			9.7	0
from this:							
phosphorite meal for agriculture	"	0.4	9.4			0	0
Synthetic ammonia	"					98.7	41.0
Sulphuric acid	"	552	547	460	46	22.8	0
Toluol	"					16.5	6.3
Benzol	"					40.0	14.6
Formalin (techn. 37%+/-0.5)	"					34.3	6.7
Synthetic resin and plastic	"					13.3	5.6
Rubber footwear	thous.pairs					317	223
Drugs (at selling price with sales tax)	EEK mill.					25.8	24.3
Analgin	mill.amp.					4.5	6.7

Table I. cont.

Product	Unit of measure	1989	1990	1991	1992	1992 1 half year	1993 1 half year
Digoxin	thous. pack.					210	31
Steel cast	t					3065	1478
Cast iron	t					3928	1751
Alternative current motors with the height of rotation axis 63-450 mm	thous.units	215	205	202	66	33.9	2.0
Alternating current motors with the height of rotation axis 63-450 mm	thous.kW	1509	1402	1444		234	87
Power converters with capacity of 5 kW or more	-"	3283	3358	2978		726	52
Excavators	units	1645	1690	1235	103	123	9
Tank cars and lorries with special boxes	-"					26	0
Apparatus, automation vehicles and their spare parts	EEK mill.					38.1	12.7
Radio-measuring apparatus	EEK thous.					5046	0
Control and measuring apparatus for technological processes	EEK mill.					33.0	12.7
Power cable for tension up to 1 kW (types JRG, NRG and URG)	km					497	328
Power cable (bending)	thous.km	12.9	14.3	8.2		0.15	0
Oil processing equipment	EEK mill.					8.45	11.2
from this							
oil apparatus	EEK mill.					0.51	0.93
air cooling equipment	EEK mill.					7.93	10.27
Agricultural machinery	EEK thous.					932	955
Spare parts for agricultural machinery (for repair and exploitation)	EEK thous.					459	45
Sawn timber ¹⁾ 30.9	thous.m ³	685	500	462	153	67.1	
among this:							
sawn timber from own raw material ¹⁾	thous.m ³					58.1	19.4
Plywood	-"	30.8	23.0	24.9	6.5	3.33	3.07
Fibre board	mill.m ² conv.	19.3	19.5	18.8	7.8	4.15	3.82
from this							
hardboard	-"					3.27	2.73
Particle board	thous.m ³ conv.	178	136	124	6.1	42.29	11.28
Matches	thous.stand. boxes	801	791	782		228.3	107.6

1) Excluding data of the Estonian Forest Office

Table I. cont.

Product	Unit of measure	1989	1990	1991	1992	1992 1 half year	1993 1 half year
Pulp, total	thous.t	92.0	68.4	65.7		24.82	0
from this commodity	"-					2.45	0
Paper - total	"-	91.8	77.3	77.5	34.4	25.39	0.61
Writing and exercise book paper	t					100	0
Writing and exercise book paper	mill.m ²					1.6	0
Stationery (selling price minus sales tax)	EEK thous.					3190	5838
pasteboard	thous.t	4.8	4.8	4.9		0.87	0.18
Skis, total	thous.pairs	1031	1020	715		150	80
Furniture, total (selling price minus sales tax)	EEK mill.					253	175
Exercise books	thous.units					5005	0
Wallpaper	thous.conv. pcs					1790	81.3
Window glass	thous. m ² phys. units	1892	1638	1600	781	572	437
Prefabricated ferroconcrete components and products	thous.m ³	995	889	768	228	172	38
Cement	thous.t	1129	938	905	483	324	177
Wall materials (excl. ferro concrete panels)	mill.conv. bricks	728	693	737	353	271	45
Building bricks	mill.conv. bricks	253	203	222		101	25
Linoleum, total	thous.m ²					58.1	73.3
Mineral wool and products from it (recalculated into standard wool)	thous.m ³		226	227	59	43.5	3.8
Soft roofing	mill.m ²	32.2	23.7	17.6	2.0	0.53	0
Asbestos cement	mill.conv. slabs	71.9	69.2	70.9	35.1	25.9	5.1
Roof tiles	thous.m ²	36	33	26		270	227
Rough towels	thous.m					2937	1118
Cotton yarn	thous.t					13.4	6.6
Cotton cloth	mill.m ²	188	169	168	111	65.6	25.0
Linen yarn	t					348	136
Woollen yarn	t					985	141
Woollen cloth	thous.m ²	7600	7100	6600	3500	2599	569
Silk cloth	mill.m ²	10.8	6.5	5.3	0.8	0.68	0.10
Nonwovents (cloth type)	mill.m ²		20.2	20.9	10.7	8.01	1.57
Linen cloth	mill.m ²	11.4	10.5	10.2	4.9	3.0	1.2
Textile haberdashery (in selling price with sales tax)	EEK mill.					12.1	5.3
Carpets	thous.m2	6200	6100	5600	2372	1487	1404
Hosiery	mill.pairs	17	18.7	16	9.8	5.48	3.07
from this							

Table I. cont.

Product	Unit of measure	1989	1990	1991	1992	1992 1 half year	1993 1 half year
children's	mill.pairs					1.25	0.54
Men's, socks	mill.pairs					2.04	0.82
Children's pantyhose	mill.pairs					0.69	0.36
Women's pantyhose	mill.pairs					1.66	1.26
Knitwear	mill.units	23.6	23	22.4	15.8	9.96	2.12
incl. children's	.."					3.45	0.81
Sewn products (selling price with sales tax)	EEK mill. .."					194	141
incl. children's						17.8	5.8
Coats, jackets, total	thous.units					122	78
Suits	.."					77	30
Jackets	.."					167	99
Shirts	.."					811	308
Products from chrome leather	mill.dm ²					48	20.2
Leather haberdashery (selling price with sales tax)	EEK mill. .."					16.9	10.2
Furs and fur products (selling price with sales tax)	.."					7679	4685
Footwear	thous.pairs	7100	7200	6300		2458	477
incl. children's	.."					621	108
Meat, incl. byproducts of 1 cat. total	thous.t	187	160	128	81	38	26
Poultry	.."	24	15	15		3	1.1
Sausages	.."	50	48	43	34	15.7	16.2
Melted fat for food	t					1131	781
Half-finished products	thous.t	29	27	20		5.9	6.5
Butter	.."	31	29	28	26	12.3	10.3
Fat cheese	.."	17	16	14	9	4.3	2.7
Whole milk products (converted to milk) total	.."	416	412	296	148	79.6	61.9
Whole milk and cream powder and mixtures	t					1003	519
Skim milk powder, substitute for whole milk (TPA), whey powder, total	thous.t					9.7	11.6
from this							
skim milk powder	.."					9.4	11.5
TPA	.."					0.25	0.04
whey powder	.."					0.08	0.01
Ice cream, total	.."	5.8	5.8	3.0		0.8	0.6
Canned food	mill.conv. cans	355	324	263	121	82.1	37.9
from this							
canned meat	.."	17.8	17.5	12.0		5.5	0.9
canned fish, incl. canned sea products	.."	247	235	191		61.9	30.5
condensed milk	.."	14	13	6.5		1.5	0.7
canned fruits and vegetables	.."	67	49	44		13.2	5.8

Table 1. cont.

Product	Unit of measure	1989	1990	1991	1992	1992 I half year	1993 I half year
Edible fish products, excl. canned fish	thous.t		370	317	120	33.2	39.3
Fish flour	t					3153	2680
Pastries	thous.t		151	149	133	64.9	55.0
Baker's yeast	t					1408	809
Confectionery	thous.t	53.8	51.4	28.3	14.3	7.4	5.6
Macaroni products	t	6400	5900	6600	6000	3500	585
Margarine	t					917	466
Mayonnaise	t					173	258
Crude ethanol	thous.dl					145	213
Rectified ethanol	-"					136	243
Spirits and liqueur products	-"	1490	1474	1605		599	734
Wine	-"	250	171	297		62	21
Beer	-"	8927	7685	6755		2077	1817
Refreshing drinks	-"	5474	4616	3269		827	955
Mineral water	mill.half liters	99.2	93.2	78.9		1.85	0.76
Starch	t	700	1100	900		518	656
Syrup	t	4200	4900	2300		287	388
Cigarettes	mill.pcs	4726	4165	3577		606	1516
Perfumery and cosmetics	EEK mill.					15	2.6
Flour	thous.t		159	155	121	62	39
from this							
wheat flour	-"					19.8	21.4
Groats	-"					8.7	1.3
Food concentrates	t					87	33
Concentrated fodder	thous.t					166	116
Protein and vitamin adds	t					0	0
Protein for feed (micro- biological)	t					790	0
Toys and Christmas decora- tions (selling price with sales tax)	EEK mill.					10.6	6.6
Synthetic washing materials	t					2120	1380
Synthetic washing materials in small package	thous.t	40.8	39.5			1.43	1.14
Lacquers and paints	t					363	467
Jewelry (selling price with sales tax)	EEK mill.					7.79	14.2
High quality household utensils (selling price with sales tax)	EEK thous.					9819	2775

11.6. Profitability in different industries

In 1992 manufacturing accounted for 43.7% of the Estonian profit from realization and 32.8% of the gross profit. The share of mining industry was 2.1% and 1.4% respectively (Table 1).

Table 1. Profit of Estonian national economy in different industries in 1992

Industry	Number of firms	Gross profit		Profit from realization	
		EEK 1000	%	EEK 1000	%
Total national economy	16742	5557726	100.0	4320084	100.0
Agriculture, hunting and forestry	1073	392713	7.1	382662	8.9
Fishing	78	32900	0.6	17581	0.4
Mining	31	78518	1.4	90082	2.1
Manufacturing	3602	1820888	32.8	1888189	43.7
Power engineering, gas and water supply	108	420577	7.6	344634	8.0
Construction	1912	263705	4.7	227405	5.3
Wholesale and retail trade, repairs of motor vehicles, motor-cycles and personal requisites and household machines	4605	562565	10.1	529662	12.3
Hotel and restaurants	746	100883	1.8	95595	2.2
Transport, storage and communication	715	1767760	31.8	708191	16.3
Financial institutions and insurance	55	9117	0.2	2356	0.1
Real estate, renting and business services	2782	81883	1.5	19045	0.4
Education	110	4109	0.1	3190	0.1
Health care and social security	111	1434		744	
Other community, social and personal services	814	20674	0.3	10748	0.2

In order to estimate the profitability of different activities it is most practical to proceed from the realization profit and profitability (ratio of realization profit to expenses). The respective data are in Tables 2-6.

Table 2. Profitability of the Estonian manufacturing industry (ratio of profit from realization to expenses) by different ownership forms in 1992.

Ownership form	Profit from realization (EEK 1000)	Total expenses (EEK 1000)	Profitability (%)
Manufacturing	1888189	8723504	21.6
among this:			
State property	1490014	5126156	29.1
Municipal property	-32	4927	-0.6
Private property	248167	1456312	17.0
Cooperative property	115688	647467	17.9
Property of public organization	7167	11988	59.8
Property of leased enterprise	13347	513192	2.6
Property of foreign countries	-3286	5030	-65.3
Joint property of Estonian entrepreneurs	34644	100594	34.4
Joint property with foreign participation	-17520	857838	-2.0

Table 3. Profitability of the Estonian mining industry (ratio of profit from realization to expenses) by different ownership forms in 1992

Ownership form	Profit from realization (EEK 1000)	Total expenses (EEK 1000)	Profitability (%)
Mining industry	90082	403579	22.3
among this:			
State property	80270	376740	21.3
Municipal property	-	-	-
Private property	7875	10076	78.2
Cooperative property	5	40	12.5
Property of public organization	-	-	-
Property of leased enterprise	1837	13080	14.0
Property of foreign countries	-	-	-
Joint property of Estonian entrepreneurs	-58	477	-12.2
Joint property with foreign participation	153	3166	4.8

Table 4. Profitability of the Estonian manufacturing industry (ratio of realization profit to expenses) by different ownership forms in the I half-year of 1993

Ownership form	Number of firms	Profit from realization (EEK 1000)	Total expenses (EEK 1000)	Profitability (%)
Manufacturing	3810	512049	5727456	8.9
among this:				
State property	372	348945	3219548	10.8
Municipal property	17	181	4335	4.2
Private property	2298	71171	1271057	5.6
Cooperative property	680	14984	311535	4.8
Property of public organization	16	3573	7772	46.0
Property of leased enterprise	46	34017	282093	12.1
Property of foreign countries	18	-3553	9916	-35.8
Joint property of Estonian entrepreneurs	39	10503	62338	16.8
Joint property with foreign participation	324	32228	558862	5.8

Realization profit = Net turnover of realization - Total expenses.

Net turnover of realization = Gross turnover of realization - Deductions from gross turnover.

Deductions from gross turnover consist of the following components:

- 1) sales tax;
- 2) excise duty;
- 3) customs revenue;
- 4) other.

Table 5. Profitability of the Estonian mining industry (ratio of realization profit to expenses) by ownership forms in the first half-year of 1993

Ownership form	Number of firms	Profit from realization (EEK 1000)	Total expenses (EEK 1000)	Profitability (%)
Mining industry	36	29078	311912	9.3
among this:				
State property	6	26889	294840	9.1
Municipal property	-	-	-	-
Private property	22	2028	8845	22.9
Cooperative property	2	-	-	-
Property of public organization	-	-	-	-
Property of leased enterprise	2	-82	5229	-1.6
Property of foreign countries	-	-	-	-
Joint property of Estonian entrepreneurs	1	-79	560	-14.1
Joint property with foreign participation	3	322	2438	13.2

Expenses consist of the following components:

- 1) merchandise;
- 2) supplies;
- 3) fuel and energy;
- 4) payroll costs;
- 5) social security tax;
- 6) medical treatment contributions;
- 7) land tax;
- 8) natural resource tax within the permitted limits;
- 9) pollution tax with pollution licence within the permitted limits;
- 10) customs tax (duty) and customs tariffs;
- 11) stamp tax;
- 12) capital tax;
- 13) other taxes and duties;
- 14) miscellaneous expenses;
- 15) depreciation (wear);
- 16) change in stocks;
- 17) fixed assets produced for own needs.

Gross profit is not suitable for estimating the profitability of different activities, because it contains besides realization profit also other business incomes and expenses, as well as financial expenses and income.

Gross profit = Realization profit + Other business incomes - Other business expenses + Financial income - Financial expenses.

Other business incomes consist of the following components:

- 1) proceeds from the liquidation of fixed assets and immaterial objects;
- 2) fines, penal fines, fines for delay charged;
- 3) expired arrears of credit;
- 4) previous year's profit turned out during the financial year;
- 5) state subsidies;
- 6) other.

Table 6. Profitability of manufacturing (ratio of profit from realization to expenses) in the first half-year of 1993

Field of activity	Number of firms	Profit from realization (EEK 1000)	Total expenses (EEK 1000)	Profitability (%)
Total manufacturing	3810	512049	5727456	8.9
among this:				
Manufacturing of food products and beverages	321	259931	2377253	10.9
- production of meat and meat products	62	20865	576006	3.6
- manufacture of dairy products	32	64347	642851	10.0
- production of strong alcoholic beverages	4	61809	239771	25.8
Production of tobacco products	2	27765	31453	88.3
Manufacture of textiles	184	43285	493781	8.8
Manufacture of wearing apparel, tanning, dressing and dyeing of furs	345	21059	185958	11.3
Manufacture of leather and footwear	108	1207	104970	1.1
Manufacture of wood	570	-12321	286662	-4.3
Manufacture of paper and paper products	35	-9770	42004	-23.3
Publishing, printing and manufacture of audio records	332	11725	140570	8.3
Manufacture of coke, refined oil products and nuclear fuels	10	3097	12863	24.1
Manufacture of chemicals and chemical products	93	60180	444761	13.5
Manufacture of rubber and plastic products	114	2798	50975	5.5
Manufacture of other non-metallic mineral products	237	-24357	343894	-7.1
Manufacture of metals	14	-29	5571	-0.5
Manufacture of metal products (excl. machinery and equipment)	334	423	156749	0.3
Manufacture of machinery and equipment	257	7410	189309	3.9
Manufacture of electrical machinery and apparatus	367	6896	226952	3.0
Manufacture of transport vehicles	94	65871	246449	26.7
Manufacture of furniture	140	17275	303996	5.7
Manufacturing n.e.s.	222	10327	37442	27.6
Processing of secondary raw materials	31	19277	45844	42.0

Other business expenses consist of the following components:

- 1) loss from the liquidation of fixed assets and immaterial objects;
- 2) payments of fines, penal fines, fines for delay, etc.;
- 3) loss from hopeless and expired debit debts;
- 4) previous year's loss turned out during the financial year;
- 5) other.

Financial income consists of the following components:

- 1) interests received;
- 2) dividends received;
- 3) profit from changes in foreign exchange rate;
- 4) profit from the sale of shares and other securities;
- 5) profit from the sale (purchase) of foreign currency at auctions.

Financial expenses consist of the following components:

- 1) interests paid;
- 2) loss from changes in foreign exchange rate;
- 3) loss from the sale of shares and other securities;
- 4) loss from the purchase (sale) of foreign currency at auctions.

In the 1st half of 1993, for example, other business incomes of industry accounted for 74.5% of the profit from realization (EEK 381,233 and 512,049 thousand respectively). But other business expenses were even bigger than business incomes (EEK 443,048 thous.). Financial incomes and expenses were also very important - EEK 134,830 thous. and 312,170 thous. This makes the analysis of profitability of different industries much more complicated.

Based on the statistical material produced, it is possible to draw the following conclusions:

1. Compared with 1992 the profitability has considerably declined in manufacturing in the 1st half of 1993 (21.6% and 8.9% respectively). The profitability of mining industry has declined from 22.3% to 9.3% within the same period.
2. It is difficult to draw conclusions on the profitability of different ownership forms based on the short period and inadequate statistics. The low profitability of the property of foreign countries is probably due to relatively high starting costs and growing pains of enterprises.
3. It is also difficult to draw conclusions on the profitability of individual industries based on the short period and insufficient statistics. The negative profitability of wood industry is probably caused by the undercapacity operation due to the shortage of current assets, but the pulp and paper industry experiences a real crisis.

III. SUPPLY CONDITIONS

III.1. Domestic raw material resources

In studying the objective possibilities of future industrial development in Estonia, it is time to stop talks that Estonia is poor in natural resources. This was the propaganda of recent decades that we lack raw materials for developing our economy. This myth served the Moscow authorities to confirm understanding that Estonia has no hope to manage by itself. It was also a protective reaction by Estonia against building new primary industry units on the territory of Estonia.

Actually Estonia has big forest resources, convenient location for fishing, a lot of mineral resources and agricultural produce of its own.

Forest resources

The Estonian forests belong to the belt of mixed and coniferous with relatively favourable conditions for forest growth. Through the history forests and forestry have been an important part of the Estonian economy, although the forested area has varied greatly.

First of all the post-war years were very hard on Estonian forests, as well as the forest management system. The war and post-war persecution campaigns dislodged most of the qualified forestry personnel. Extensive clearcutting areas soon wiped out many of the valuable forest stands, reducing the share of mature stands, Spruce and pine stands suffered the most (inordinate lumbering went on up to 1961).

The forced collectivization of agriculture and the diminishing of rural population created conditions for the expansion of the forest-covered area. During the past half-century the area of forest stands has more than doubled and the growing stock on it has increased 2.4 times.

Although area of forest stands was in 1988 1815.6 ha (Table 1), there were in addition the area of young cultivated forests (up to 5-8 years old) and forest nurseries of 53500 ha, treeless plains in forests or hollows 23000 ha, clear cutting areas 20700 ha, very thinly scattered forests 3300 ha, burnt woodlands 300 ha.

Table 1. Total area of Estonian forest stands and volume of growing stock

Year	1940	1958	1975	1983	1988	1991
Area of forest stands (thous.ha)	852.7	1311.9	1655.5	1812.2	1815.6	1915.0
Total volume of growing stock (mill.m ³)	108.2	135.2	196.2	237.1	259.7	270.0

This resulted from the natural afforestation of agricultural lands and first of all from extensive silvicultural activities - forest sowing and planting as well as forest drainage.

In post-war years the area of sown and planted forests was almost twice as big as the yearly clearfelled area. Mainly pine (seed or 2 years old seedlings) and spruce (4 years old plants) was cultivated; to a lesser extent birch (seed or 1 to 2 years old seedlings), oak, ash and even foreign species like larch and douglasia. In addition to the afforestation of clearcut areas and wasteland extensive experimental and production cultures covered some of the depleted (oil shale and phosphorite) quarries.

Table 2. Tree species and category distribution of forests (1988, January)

Dominating tree species; or category of forests	Area of stands (100 ha)				Volume of stands (mill.m ³)			
	Total	from this			Total	from this		
		y s m a s p s	o t i g t r t	u a d e a e a		n n d d n m n	g d l d a d	s e s t s	u	r	e
All protected preserved forests	514.6	139.8	317.3	57.5	75.7	9.0	53.5	13.4
All exploited profitable forests	1300.0	399.9	641.3	258.8	184.0	24.9	100.9	58.2
Total	1814.6	539.7	958.6	316.3	259.7	33.9	154.2	71.6
Different tree species in all forests:								
Pine	709.5	237.2	362.8	109.5	105.9	17.7	64.3	23.8
Spruce	426.2	173.7	146.6	105.9	69.1	11.4	29.6	28.1
Oak	11.1	.6	8.7	1.8	1.3	.04	.99	.27
Birch	511.5	78	366.7	66.8	65.1	2.3	50.2	12.6
Asp	29.8	5.1	11.3	13.4	5.4	.2	1.8	3.4
All tree species, total (excl. shrubs)	1810.9	536.5	958.2	316.3	259.6	33.9	154.2	71.5

For instance, the quantity of collected seeds was 22793 kg (1991 - 853 kg) (among this 216 kg pine seeds from vegetative plantations) in state forest enterprises in Estonia in 1991, there was 252 (1991 - 238) forest nurseries with the total area 391 hectares and 79 greenhouses (1991 - 61) for seedlings. 9188000 (1991 - 7988000) pine seedlings were grown and 15182000 (13973000) spruce set. The total area of cultivated forests was in state forest enterprises 5909 hectares in 1990 (4764 in 1991), from this pine 1880 ha (1991 - 1517), spruce 3715 (3160) ha, birch 253 ha, oak 15 ha, larch 20 a.o. The share of pine plantations has decreased. While in

1961-1975 pine cultures formed 52% of the total and in 1976 43%, it has decreased to one third of the total by 1985. It was take-care of cultivated forests on 29845 (1991 - 17872) ha. Forest production suffers still negative effects from destruction of soil surface, cleaning areas from remnants of felling and their treading of the surface by heavy machines of forest industry.

Throughout the last one and a half century the most important measure for increasing the productivity of forest sites has been forest drainage with ditches, as more than half of the forest areas are excessively moist. During recent decades new drainage of forests has been carried out at a satisfactory speed and the drainage net now covers more than 450000 hectares of forest land.

Active measures of forest protection - complex of biological and chemical means, are used yearly in state forests on area of 4000-6000 hectares (1990 - 5532, 1991 - 4897 ha). Dominating measures are favour of useful bird and insect species, treatment with bacterial and chemical preparations and hormones.

The central office of forest management in Estonia is the State Forest Department under the Ministry of Environment. It controls 15 state district forest departments and 187 forest districts, forestry research centres in Tartu (Estonian Institute of Forestry and Nature Conservation, Estonian State Service of Forest Protection, Estonian Centre of Forest Breeding a.o.). In the state district forest departments and forest districts specialists are assisting the farms' private forest management too, but this system is in the stage of establishing. In the near future the repression of farmland, the emerging new farmsteads and changing ownership patterns will change the structure of forest management. In the future about half of the forests can be privatized. Up to 1990 state forest enterprises have almost two third (1988 - 60.1%), the agricultural farming enterprises 37.5% and others 3% of the total forest land area. (From the mature stands state forest enterprises have 81.9%). Since 1991 the private owners have 55000 ha forest land and this is increasing.

Forest management plans for all forest owners are drawn up for 10 years by the Estonian Center of Forest Survey. The plans determine the annual volume of clear cutting and intermediate cutting, the subsequent afforestation goals and other recommendations.

A big share of timber is produced by clear-cutting, mainly from restricted cut-over areas in mature stands. Some of the timber comes from the maintenance felling of protected or preserved forests, where natural forestry systems are used. The volume of annual final cuts is in state forests 1.2..1.5 million m³ (in all forests 1.6..2.0 million m³) and considering the total volume of Estonian timber resources this is not much. Annual increment of forest resources is about 8.4 million m³ and this is increasing.

Intermediate cutting comprises cleaning, thinning, sanitary cuts, occasional fellings (and the felling of young stands to make way for quarries, amelioration works, building of roads, etc.). Thinning is used for regulating the distribution of forests by tree species and for making room for the young and for perspective trees, previously mostly for spruce and pine, at present for birch, oak or ash, depending on site conditions. The volume of annual thinning is about 1.2..1.3 million m³ (1 million in state forests). Volume of intermediate cutting, the thinnings and sanitary cuts should be much more extensive (about 25%), as today (broadleaved species about 30-35%). The development of our forest industry must concentrate on using this raw material.

From different ways of intermediate cutting especially the volume of thinning in young stands and sanitary cuts must increase.

Table 3. Forest resources Main land-use categories Year: 1991

	Total area (1000 ha)	Percent of total %	Coniferous (1000 ha)	No-coniferous (1000 ha)
Total land (excl. water)	4310	100		
of which:				
Forest and other wooded land	2016	47	1252	764
- closed forest	1915	45	1191	724
- Exploitable	1907	45	1185	722
- Unexploitable	8		6	2
- Other wooded land	101	2	61	40
- Non-forest land	2294	53		
- Agricultural land	1501	35		
- Other	793	18		

Table 4. Forest area by ownership and management status Year: 1991

	Closed forest		Other wooded land
	Total	Managed according to plan	
	(1000 ha)		
Area covered	1915	1915	101
of which:			
Publicly owned	1860	1860	99
- State	1090	1090	62
- Other	770	770	37
Privately owned	55	55	2
- Farm forests	55	55	2

Fish resources

The length of the Estonian coast-line is 3794 km, from this that of mainland 1242 km.

In Estonia, there are about 1200 lakes and artificial lakes larger than 1 hectare, which together with bog-pools make 2130 km² or nearly 4.8% of the territory of Estonia.

There are 7378 rivers, creeks and main drainage canals in Estonia, with total length 31,153 km. Most of the rivers are small, only 420 rivers are longer than 10 km, and 9 rivers 100 km or longer.

Thus, Estonia has preconditions for fishing both at sea and in inland water bodies, as well as for fish breeding.

In the post-war period the ocean fishing fleet with the basis in Tallinn developed fast. After regaining independence, Estonia became the actual owner of a rather big ocean fishing fleet and the facilities on shore built for processing fish. The ocean fishing fleet consists of 50 fishing boats of different size and age, and it is capable to catch 150,000-170,000 tons of fish and ocean invertebrates a year. The domestic fish market of Estonia can consume only an insignificant part of it.

Experts have doubts about the economic expediency of maintaining the ocean fishing fleet. Both the market situation and access to ocean fish resources have changed essentially. Previously fishing and fish processing technology were based on the use of cheap energy. Now fuel and other necessities for vessels are bought at world market prices and this has raised the cost price of fish considerably. This makes the trading in traditional markets, including in Eastern market difficult. According to the Food and Agricultural Organization (FAO) of the UN, it is increasingly difficult in the world to get access to productive fishing areas in economic zones of foreign countries. Therefore the Estonian Minister of Environment Andres Tarand and Estonian Fish Office have turned to the FAO with the request to help Estonia work out development trends in ocean fishing.

In 1988, the fishing and other sea product production was 267 kg per capita in Estonia (in 1980 294 kg even). More than Estonia produced only Norway (464 kg) and Denmark (327 kg). The respective indicator of Finland was 32 kg in 1988.

By today ocean fishing has considerably diminished but fishing will remain an important branch of economy also in the future. Its volume depends largely on the fishing limits granted to Estonia.

According to the fish research centre of the Estonian Marine Research Institute the resources of main fish of prey were as follows:

Baltic herring resources and catch have been stable in Estonian territorial waters. In the first half of 1992 2, 3, 4, and 6 years old, in autumn 1-3 years old Baltic herrings were dominating in the catch. According to provisional estimates a generation of at least average potency was formed. The average age of Baltic herring has gradually decreased in different age groups (also in 1992), which proves that feeding conditions are continuously poor.

Brisling resources are quite good in the northern part of the Baltic Sea. The catch consists mostly from 1-5 years old brislings. Decline in the catch in 1991 was primarily due to the decrease in trawling and its relocation.

Codfish resources are small in the Estonian economic zone at present. Considering the in-flow of Atlantic waters into the Baltic Sea in January 1993, there is hope that in 3-4 years time we can catch codfish in Estonian waters again.

Plaice catch has steadily decreased and this continued also in 1992. The main reason is considered to be unfavourable conditions for plaice developed in the Baltic Sea.

Open sea fishing for salmon decreased in 1992. Previously Estonian fishermen caught salmon by drift nets in Latvian, Lithuanian and Russian waters. More salmon and salmon trout than in

previous year were caught in the sea shelf. There are 5 spawning rivers for salmon and ca 35 for salmon trout in Estonia. The reproduction of fish is quite stable in them.

Lavaret resources are small as before. The reason for this is the unfavourable breeding conditions ensuing from eutrofication of the sea.

The situation in smelt resources in the Gulf of Riga are still bad.

Pike resources are poor. The reason is unfavourable breeding conditions.

Vimba fishing is concentrated mostly near Pärnu, where the resources are sufficient. In 1992 the generation of 1984 was dominating in the catch (also in the Finnish Gulf). The generation of 1986 was also strong.

The main ide fishing areas are near the south-eastern coast of Saaremaa and Väinameri. The resources are sufficient.

Pike-perch is caught mostly in the Gulf of Pärnu. Generations of 1984, 1986, 1988 and 1989 are strong or above the average, those of 1991 and 1992 weak. Present resources are adequate, but from 1995 on an essential decline in the catch is expected.

The resource of perch as an important fish of prey of the whole Estonian sea shelf is sufficient.

Table 5. Catch from the Baltic Sea (Economic zone of Estonia) in 1992 (tons)

Species	Quantity
Baltic herring	29556
Brisling	4139
Godfish	227
Plaice	164
Salmon	31
Salmon trout	9
Eel	8
Lavaret	10
Smelt	92
Pike	37
Vimba	70
Ide	98
Bream	4
Roach, bleak	148
Garfish	15
Burbot	1
Pike-perch	169
Perch	802
Lamprey	1
Other	195
Total	35776

Of the Estonian inland water bodies the most important in fishing are Lake Peipsi-Pskov and Võrtsjärv. As compared with the period 1987-1991, the total catch decreased by 245 t, and as compared with 1991 150 t in 1992. The total catch of "other" fish from Võrtsjärv and Peipsi-Pskov consist mostly of ruff, small perch and roach and bleak. From other lakes of Estonia 60 t of fish were caught according to estimates.

Total catch of fish from the Baltic Sea and inland water bodies is given in Tables 5 and 6. The catch from neither sea nor inland water bodies does include the catch by anglers, which was 400-600 t annually in 1985-1990.

10000 salmon fingerlings of the same summer and 12000 one year old fingerlings, 10200 2 years old salmon trout fingerlings and 145000 salmon trout fry, 45000 one year old rainbow trout fingerlings, 3.5 million lamprey fingerlings were put into the Baltic Sea in 1992. Into inland water bodies mainly pike fry and fingerlings and 1-2 years old tench were launched.

Table 6. Catch from inland water bodies in 1992 (tons)

Species	Quantity	
	Peipsi-Pskov	Vortsjärv
Sparling	1551	-
Pike-perch	419	13
Bream	224	101
Pike	67	26
Peipsi lavaret	34	-
Perch	403	8
Vimba	1	-
Ide	1	1
Roach	151	-
Eel	-	30
Burbot	8	5
Other	346	117
Total	3205	301

Combustible mineral resources

1. Oil shale (kukersite)

The geologically explored resources of the most important mineral of Estonia are 3.8 billion tons, from this exploitable resources 2.2 billion t. Oil shale is used mostly in power engineering and oil shale chemistry, oil-shale ash also for liming fields and in building materials industry. In the 1980s up to 32.9 million t of oil shale was mined annually, in 1992 18.8 million t (from this 9.4 mill.t in underground mines and 9.4 mill.t in open-cast pits).

2. Alum shale

The resources of this up till now unused mineral amount to 60 billion tons. The shale has been explored more in the deposit of Toolse, where the reserve resource has been estimated at

141.4 million tons. Though the alum shale is combustible due to the organic substance addition, it is made attractive by rare and diffused elements contained in it. There are over 20 such microelements discovered in alum shale, but several of them have quite high content, e.g. uranium, vanadium and molybdenum. Of macrocomponents, besides organic substance also Al_2O_3 , K_2O , iron and sulphur are of practical interest.

Several schemes for complex usage have been made. Main way is burning for getting thermal energy and chemical treatment of the remaining ash and concentration for getting some components. Thus the alum shale can be used in four branches of economy:

- in chemical industry - in solid heat carriers for getting oil products and household gas; for chemical treatment and concentration; for producing alum, microelements, etc.;
- in power engineering - for burning in special boilers for getting thermal and electric energy;
- in building materials industry - in the production of decorative building components from silica concrete;
- in agriculture - ash remaining over from shale is used as potassium fertilizer (contains also microelements).

It would be expedient probably to mine alum ash and use it together with other mineral resources (e.g. phosphorite).

3. Peat

The area of industrially attractive peat deposits is 477,000 hectares and total resources 1.4 billion tons.

Estonian peat resources are used in agriculture as litter moss and fertilizer and for improving soil in horticulture (ameliorative peat) and in communal economy for producing fuel (peat briquette).

New fields of use in Estonia could be the production of growth stimulants from well-decomposed swamp peat rich in huminuous substances. Suitable raw material for that can be found 57 million tons and it is distributed evenly across the whole country. The technology of producing growth stimulants from peat is relatively simple.

There can be found also raw material for peat wax (well-decomposed cotton-grass, sphagnum and sedge peat) in Estonia - 1.6 mill.t.

Besides the above-mentioned fields of use, peat can be used also for producing activated coal for purification plants, pigments, cosmetics, medicaments, filters, coke, resins.

The most recent use in the world has been the use of peat in balneology (substitute for therapeutic mud).

In 1992 the total production of peat was 1,356 thous.t, including 695,000 t of litter moss, from this 669,000 t of bedding peat and 26,000 t ameliorative peat, and 663,000 t of heating peat. As compared with 1991 the total production of peat decreased 25%.

While planning production one should take into consideration that cranberry swamps remain there. The abandoned peat fields are perspective for starting cranberry plantations.

Geologists have not lost hope to find *oil* in the western parts of Saaremaa and Hiiumaa and in the shelf of the Baltic Sea. But the search for large *gas* deposits has been declared perspectiveless.

Phosphorite

Industrial attraction is presently offered by the obolus sandstone where the thickness of layer is at least 1.0-1.5 metres and the P₂O₃ content over 3%. All well-known and explored phosphorite deposits are situated in North-Estonia. As of January 1, 1992, the phosphorite resources of Estonia were as follows:

- active usable resource - 82.3 mill.t
- reserve resource - 258.5 mill.t
- predictive resource - 525.9 mill.t

Laboratorial experiments have proved a possibility to produce compound fertilizers from Estonian phosphorite: nitrophosphate, ammonium phosphate, etc. as well as superphosphate. The main problem is the profitability and competitiveness of this industry, because there are many phosphates, as well as high-quality apatite available cheaper in the world.

Besides fertilizers, it would be possible to produce also components of fluorine, strontium etc. from phosphorite.

In 1992, phosphorite was not mined in Estonia.

Natural building materials

1. Limestone

The fields where limestone is used have developed depending on its chemical composition and physical-mechanical qualities. Limestone and dolomite are used as building stone, finishing stone, technological stone in paper and pulp industry, for burning lime, for producing cement, etc.

1.1. Building stone

Limestone to be used as building stone must be resistant to weather conditions, i.e. with high cold-resistance, pressure resistance, resistant to blows and wear.

There are 15 building stone deposits with explored usable resources in the republic. Their active usable resources are over 215 mill.³. From them 11 deposits with total resources of 180 mill.³ are in use.

1.2. Finishing stone

Finishing stone is actually a kind of building stone which is decorative and easy to process.

Finishing stone is quarried only in the Kaarma dolomite deposit in Saaremaa, where the usable resources are 0.4 mill.³. But it is possible to use as finishing stone the building stone of several other deposits.

1.3. Technological stone

As technological stone we regard limestone which is raw material for various industries.

Combustible limestone. In the balance sheet of the republic, there are 6 deposits with usable resources of 30 mill.t. Limestone suitable for a small producer can be found also in other deposits.

Cement limestone. Limestone as a raw material for cement is quarried in Kunda limestone deposit, where the usable resource is 44 mill.t and reserve resource 30 mill.t. Besides Kunda deposit, there are Kureliiva and Toolse deposits in reserve (usable resource 90 mill.t).

Raw material for paper and pulp industry and metallurgy. Limestone deposits satisfying their requirements are in Padise and Rummu, where the usable resources are nearly 50 mill.m³.

Glass dolomite. Dolomite meeting such requirements can be found very little in Estonia. In Hellamaa dolomite deposit the usable resource is 1.8 mill.t. It is possible to use also low-quality (highly feriferous) Anelema dolomite (resources there are also running short).

In 1992 technological limestone production for burning oil was 51,000 m³ in Karinu deposit (33% of the 1991 production), for pulp and paper industry (Rummu) 33,000 m³, (206% of the 1991 production). Cement limestone production was 280,000 m³ (60% of the 1991 production). Building limestone production 1,012 thous. m³ (42% of the 1991 production).

2. Granite

Boulders can be used in construction and for rubble (quantity below 2 mill.m³).

The Maardu granite deposit is at 170-200 metres depth and its reserve resource 258 mill.m³.

3. Sand and gravel

There are over 900 sand and gravel sand deposits known, with usable resources 250 mill.m³ and reserve resources over 1000 mill.m³. Predictive resources are estimated at 600 mill.³.

In 1992 2.2 mill.m³ of sand and gravel was quarried, from which 0.4 mill.m³ was used as filling in construction sites and road embankments. As compared with 1991 gravel sand production was 3 times smaller and filling sand production 8 times smaller.

4. Clay

In Estonian balance sheet, there are 9 clay deposits with usable resources 32 mill.m³.

In 1992 the total production of clay was 165,000 m³, including 700 m³ of badly melting clay. As compared with 1991, the production declined 1.8 and 11 times respectively.

Ores

1. Iron ore

Jõhvi iron ore deposit is not fully explored as of yet. The diameter of the whole area is about 8 km. Predictive resource as deep as 500 metres may be 355 mill.t and as deep as 700 m 629 mill.t.

Though the deposit is in quite a handy place (only 5 km from sea, in the region of oil shale industry and otherwise advanced economy), its utilization is problematical at present. Great bedding depth of ore and the existence of better deposits or those of the same quality in the world make the foundation of a profitable and competitive mining enterprise based on iron ore of Jõhvi quite doubtful.

2. Pyrites

Pyrite resources are estimated at 100200 million tons in Estonia. For economic and mining reasons pyrite layers can be used only together with phosphorite and alum shale. At present the mining for pyrite is problematical.

3. Polymetals (lead and zinc)

In the 17th century galena was gathered near Võhma and metal melted from it. Regardless of explorations deposits have not been found.

4. Uranium

Uranium has been prospected for and explored over several decades. Unfortunately the situation is that we lack any information on the results obtained, since the works were carried out by the Soviet Union special secret geological organizations.

The uranium resources in lower stratum have not been calculated so far. Uranium resources contained in phosphorite may be about 0.2-0.4 million tons within the whole bounds of the Baltic phosphorite basin. The Kabala mining field of the Rakvere deposit has been better explored. There the predictive resources are 10588 t (average uranium content in phosphorite

21.1 g/t). In Toolse the reserve resource of uranium is estimated at 27149 t. A lot of uranium can be found also in alum shale (has been produced experimentally).

5. Transuranic ores (lanthanides and yttrium)

The phosphorite of the Baltic phosphorite basin may contain up to 10-20 million tons of transuranic ores. They have been better explored in the experimental field of Kabala, where the predictive resources of TR_2O_3 are estimated at 237,400 tons (at the average content of TR 0.0474% in the rock). The utilization and perspectives depend on the complex use of phosphorite deposits.

6. Molybdenite and vanadium

The resources of molybdenite and vanadium depend on the total resources of alum shale, where the content of molybdenite is up to 833 g/t and that of vanadium up to 1480 g/t. The alum shale of the Toolse phosphorite deposit contains 406 g/t of molybdenite and 1040 g/t of vanadium. The reserve resources of these elements have been calculated within the bounds of the Toolse deposit: 57400 tons of molybdenite and 147100 tons of vanadium.

7. Strontium

Strontium content in phosphorite is 380-3250 g/t. In the phosphorite of the Kabala mining field the predictive resources of SrO are estimated at 851300 tons (at the average content of 0.17%).

8. Gold, platinum and other ores.

The resources have not been decided on yet, since information is still insufficient. Gold has been found 0.1-1.0 g/t in black slates (usual content 0.002-0.008 g/t). The concentration of platinum ore is 0.003-2.0 g/t. In the Pakri peninsula alum shale with the gold content up to 2-3 g/t has been found.

Other solid mineral resources.

1. Natural pigments.

Of the anorganic pigments that can be found in the bowels of the earth in Estonia the most important are ochre or bog ore and glauconite sandstone (-sand).

There are no more detailed information on the ochre resources. Some twenty or thirty ochre deposits are known.

The geological resource of glauconite sandstone is practically unlimited. Besides producing paints, it can be used as building material and for producing glauconite (for producing permutable filters necessary for softening hard water).

2. Lake chalk

There are over 150 lake chalk deposits in Estonia. Total resources are estimated at about 300 million tons.

Lake chalk can be used due to the calcium-carbonate contained in it for various purposes (feeding chalk, building material, component of glue paint, etc.).

3. Diatomite

After the incorporation of the regions behind the River Narva into Russia, Estonia lost its best diatomite deposits.

The Leekova deposit is 7-8 km north-west and 2-3 km south-west from Narva. The explored active usable resource is 7,917 thous.m³ or nearly 4 million tons. A little diatomite can be found also in Rannametsa in Pärnumaa.

Diatomite can be used as filling, insulating and absorbent material in various industries.

4. Mud.

Usable resource of lake mud is over 10 mill.3. Besides this, sapropel can be found in swamps under peat, where the reserve resource is over 8 mill.t and predictive resource 50 mill.t.

It is possible to produce granulated organic fertilizer on the basis of sapropel and mineral fertilizers.

Lake mud contains vitamins B1, B2, B12 and D15, foil acid and biologically active microelements. Gelatinous sapropel can be successfully used also as feed for livestock and poultry.

In 1992 1000 t of lake mud was produced from the Väraska deposit for medical treatment in the local sanatorium. Sea mud. The resources of the three main deposits - Haapsalu Bay, Kuresaare Bay (Mullatu-Suurlahe) and Käina Bay - are estimated at 2.6 mill.³.

In 1992 1300 t of therapeutic mud was produced from the Haapsalu and Mullatu Suurlaht for the Estonian medical institutions.

The available therapeutic mud resources enable to considerably increase its use in Estonia as well as export it.

5. Underground water

The presumptive underground water resource is 1533.8 thous.m³/24 h and the confirmed resource 682.8 thous.m³/24 h.

6. Mineral water

Mineral waters were discovered quite recently in Estonia. By today mineral water has been discovered in nearly 25 wells. Usable resource (m³/24 h) is 17-1460 in deposits.

The book resources of the major mineral resources of Estonia as of January 1, 1991 are produced in Table 7.

Table 7. Major mineral resources of Estonia (according to balance sheet as of January 1, 1991)

Mineral	Resource
Oil shale, mill.t	6396.0
Phosphorite, mill.t	1340.1
recalculated to 100 % content of P O	167.6
Raw material of cement, mill.t limestone	289.8
clay	64.6
sand	2.0
Glass sand, mill.t	3.8
Building sand, mill.m ³	175.2
Gravel sand, mill.m ³	34.0
Fuel limestone, mill.t	31.6
Brick clay, mill.m ³	36.7
Sand deluter, mill.m ³	18.0
Building stone, mill.m ³	375.4
Cover dolomite, thous.m ³	449.0
Peat (deposits over 1000 ha), mill.t	1187.3

Agricultural raw materials

Of 4.522 million hectares of Estonian territory agricultural land totalled 2.568 million hectares as of January 1, 1993. From this 12700 hectares were under horticultural farms and plantations, 6000 hectares of agricultural land were on state-owned wooded land. 1.111 million hectares were arable land.

8412 private farms (with 214,000 hectares in all) have been established mainly based on the Farm Act. Most of the collective and state farms were liquidated by the land reform by the end of 1992. About 2400 agricultural cooperatives were formed. The creation of state farms for experimental and breeding works started.

The average total yield of agricultural crops was as follows in 1986-1990:

Grain crops, fruits and vegetables

storage weight - total	- 838,700 t
winter crop	- 172,600 t
rye	- 135,500 t
wheat	- 37,200 t
summer crop and legume	- 666,000 t
wheat	- 12,100 t
barley	- 570,400 t
oats	- 59,600 t

mixed crop	- 23,500 t
legumes	- 400 t
Flax	- 800 t
Vegetables	- 131,600 t
Potatoe	- 814,500 t
Forage root crop (including sugar peat)	- 431,200 t

There are good conditions for growing rye, potatoes, beer barley, and in some regions flax in Estonia.

The average yield of fruits and berries was as follows in 1986-1990:

Fruits and berries total	- 39,900 t
fruits with seeds	- 26,400 t
drupes	- 1,100 t
berries	- 12,500 t

The production of livestock products was as follows in 1990:

Meat in slaughter weight	- 219,300 t
beef	- 79,900 t
pork	- 114,500 t
mutton and goat meat	- 3,000 t
poultry	- 21,600 t
rabbit and nutria	- 300 t
Milk	- 1,208,000 t
Eggs	- 547,100 pcs
Wool (physical weight)	- 205,000 t

The production of agricultural produce per capita in 1989-1992 is in Table 8.

Table 8. Agricultural produce production per capita in 1989-1992 (kg)

	1989	1990	1991	1992
Grain crop in storage weight	613	605	600	388
Potatoe	548	391	378	433
Vegetables	91	66	77	51
Meat	145	139	117	85
Milk	810	763	698	595
Eggs, pcs	380	346	357	295

Though the agricultural production has essentially declined due to the great changes in agriculture in recent years, the restoration and even exceeding of previous output levels in appropriate fields of production is quite feasible in Estonia.

III.2. Fixed assets and their technological level

As of July 1, 1993, the assets in Estonian manufacturing and mining industry were as follows (EEK 1000).

	Manufacturing	Mining
Liquid assets	2681415	185898
Stock and		
Productive assets	2429331	78983
Fixed assets	5290857	597987
Long-term financial		
investments and loans	430936	589

The task of this chapter is to analyze the technological level of fixed assets. The last thorough study in this field was unfortunately made as of April 1, 1986. Though over seven years have elapsed since then and the data are hopelessly outdated, we still produce the basic conclusions of that time.

1. Depreciation of fixed assets 44%, incl. the depreciation of machinery and equipment 54%. And 16% of the machinery and equipment had depreciated over 100%, 17% 76-100%. 32% of the machinery and equipment were older than 10 years, incl. 11% older than 20 years.

2. 30% of the machinery and equipment conformed by their technical-economic parameters to the world standards, 44% conformed to the USSR standards, 26% needed immediate replacement. Most important among reasons causing the replacement of machinery and equipment were low productivity (31%) and insufficient precision and reliability (27%).

3. 22% of the technological processes conformed to the world standards, 61% to the USSR standards and 17% of the technological processes needed to be replaced.

As we lack any kind of statistics on the technological structure of Estonian industrial fixed assets in recent years as well as on their distribution between different age groups, etc. the present analysis is reduced mostly to determining the depreciation.

The structure of fixed assets in Estonian manufacturing and mining industry (by ownership forms) as of July 1, 1993 is produced in Tables 1 and 2. The analysis of these tables should proceed from the following connection:

Total fixed assets (book value) = Total fixed assets (purchase cost) - Depreciation of fixed assets + Unfinished capital works + Uninstalled machinery and equipment.

The depreciation of Estonian manufacturing fixed assets and productive assets calculated on the basis of Tables 1 and 3 in different ownership forms is as follows.

	Fixed assets		Productive assets
	Jan. 1 93	July 1 93	July 1 93
Manufacturing including:	27.0	34.4	37.0
State property	29.8	37.4	38.3
Municipal property	38.7	40.1	44.0
Private property	29.1	29.2	30.4
Cooperative property	33.6	35.7	39.3
Property of public organization	27.0	24.8	32.8
Property of leased enterprise	45.2	49.5	50.3
Property of foreign countries	3.3	7.0	7.1
Joint property of Estonian entrepreneurs	43.7	36.5	37.1
Joint property with foreign participation	17.6	17.9	14.1

The depreciation (%) of fixed and productive assets in Estonian mining industry in different ownership forms, calculated on the basis of Tables 2 and 4 is as follows.

	Fixed assets		Productive assets
	Jan. 1 93	July 1 93	July 1 93
Mining industry including:	50.2	47.1	50.4
State property	50.2	47.3	50.4
Private property	19.3	32.1	30.4
Property of leased enterprise	49.1	43.5	67.6
Joint property of Estonian entrepreneurs	3.4	20.0	22.7
Joint property with foreign participation	34.2	8.3	-

It must be taken into consideration that the analysis of depreciation is essentially based on expert estimates made within the course of reassessing the fixed assets, and that its quality depended both on the methods used and the qualification of the experts. As the fixed assets have been revalued twice in recent years (in November 1991 and April 1993), the depreciations of different years are not comparable with each other.

In order to explain the development of the fixed assets' age structure we produce some data on earlier years.

Depreciation of fixed assets (at the end of the year) in Estonian manufacturing was

1970	-	27.3%
1975	-	32.5%
1980	-	41.0%
1985	-	47.4%
1986	-	48.6%
1987	-	49.9%
1988	-	51.0%
1989	-	52.7%
1990	-	52.5%

Table 1. Fixed assets of Estonian manufacturing in different ownership forms as of July 1, 1993 (EEK 1000)

	Total fixed assets (book value)	among this					
		Total fixed assets (purchase cost)	From this Productive assets	Depreciation of fixed assets	From this Productive assets	Un-finished capital works	Un-installed machinery and equipment
Manufacturing among this:	5290857	7315624	5461815	2514415	2020228	409412	80236
State property	2565035	3736052	3020927	1395920	1157798	171103	53800
Municipal property	1874	3127	2366	1253	1040	-	-
Private property	843382	1021368	758664	298334	230820	103146	17202
Cooperative property	231608	326083	214039	116573	84076	20171	1927
Property of public organization	22330	28130	9087	6977	2978	1107	70
Property of leased enterprise	476187	928322	904926	459458	455178	6290	1033
Property of foreign countries	8593	9239	7677	646	547	-	-
Joint property of Estonian entrepreneurs	35406	51941	47929	18957	17768	1208	1214
Joint property with foreign participation	1106442	1211362	496200	216297	70023	106387	4990

Table 2. Fixed assets of Estonian mining industry in different ownerships as of July 1, 1993 (EEK 1000)

	Total fixed assets (book value)	among this					
		Total fixed assets (purchase cost)	From this Productive assets	Depreciation of fixed assets	From this Productive assets	Un-finished capital works	Un-installed machinery and equipment
Mining industry among this:	597987	1096974	855212	516553	430929	16820	746
State property	583029	1078119	843249	509521	425251	13836	595
Municipal property	-	-	-	-	-	-	-
Private property	6043	8852	6441	2840	1956	31	-
Cooperative property	-	-	-	-	-	-	-
Property of public organization	-	-	-	-	-	-	-
Property of leased enterprise	8158	9539	5500	4150	3717	2618	151
Property of foreign countries	-	-	-	-	-	-	-
Joint property of Estonian entrepreneurs	72	30	22	6	5	48	-
Joint property with foreign participation	685	434	-	36	-	287	-

Table 3. Fixed assets and unfinished capital works in Estonian manufacturing by the end of 1992 (EEK 1000) in different ownership forms

Ownership	Number of firms	Fixed assets		Unfinished capital works	Uninstalled machinery and equipment
		Purchase cost	Book value		
Manufacturing from this:	3602	3431722	2505492	326622	72414
State property	340	1439998	1010507	166260	45464
Municipal property	14	923	566	1	-
Private property	2183	530625	376303	97617	19668
Cooperative property	668	155963	103574	23214	633
Property of public organization	12	6270	4579	960	13
Property of leased enterprise	40	157644	86371	4100	108
Property of foreign countries	8	8565	8281	-	-
Joint property of Estonian entrepreneurs	35	67731	38109	1642	298
Joint property with foreign participation	302	1064003	877202	32828	6230

Table 4. Fixed assets and unfinished capital works in Estonian mining industry by the end of 1992 (EEK 1000) in different ownership forms

Ownership	Number of firms	Fixed assets		Unfinished capital works	Uninstalled machinery and equipment
		Purchase cost	Book value		
Mining from this:	31	156073	77786	10529	637
State property	6	146302	71367	9232	460
Municipal property	-	-	-	-	-
Private property	18	3835	3093	3	-
Cooperative property	1	4	4	-	-
Property of public organization	-	-	-	-	-
Property of leased enterprise	2	3957	2013	1085	177
Property of foreign countries	-	-	-	-	-
Joint property of Estonian entrepreneurs	1	29	28	-	-
Joint property with foreign participation	3	1946	1281	209	-

The increase in depreciation was due to the slowing down in the renewing of fixed assets and the decline in their dropping out.

The renewal coefficient of fixed assets in Estonian manufacturing (in factual prices)

1981 - 1985 - 28.8%

1986 - 1990 - 27.1%

The drop-out coefficient of fixed assets in Estonian manufacturing (in factual prices)

1981 - 1985 - 7.8%
1986 - 1990 - 9.0%

The analysis of the technical condition of the Estonian manufacturing fixed assets allows to say that approximately a quarter of the machinery and equipment need immediate replacement. Nearly a third of the employees are engaged in primitive and hard manual labour.

No cardinal changes have been observed in 1993 either. The amount of unfinished capital works increased 1.25 times in manufacturing and 1.60 times in mining in the period from January 1, 1993 until July 1, 1993. But the total amounts cannot be considered as big (EEK 409 mill. and 16.8 mill. respectively). The value of uninstalled machinery and equipment increased in the same period 1.11 and 1.17 times respectively. The total amounts are not big here either (EEK 80 mill. and 0.7 mill.).

III.3. Labour force, its educational level, skills and special skills in different fields

The educational level in Estonia was exposed by the population census in 1989 (Table 1). A conclusion can be drawn from its results that the educational level of the Estonian working age population is rather high.

Tables 2, 3, and 4 give an overview of the number of students and graduates of various educational institutions, Tables 5, 6, 7 and 8 the division of specialists by specialties and sciences. These data also inspire optimism.

Table 1. Educational level of Estonian working age population (data of the population census of 1989)

	Number of people	Per 1000 inhabitants
Total	850471	1000
among this		
higher education	127677	150
incomplete higher education	13603	16
secondary education	208517	245
general secondary education	257424	303
basic education	151488	178
primary education	88036	104

Many people with general education have acquired vocational training in production. Unfortunately, the statistics used in Estonia does not produce this number yet.

In recent years, besides the domestic labour training system, the cooperation with foreign firms and training institutions has progressed. Since 1992, foreign training and retraining institutions

have started to organize regular training courses in Estonia, whereas several of them plan to open their branch in Estonia.

Table 2. Number of students in different educational institutions (at the beginning of school year, 1000 students)

	1980/81	1985/86	1990/91	1991/92	1992/93
Total	283.7	289.6	287.7	283.7	271.6
General education schools	217.6	223.1	225.4	223.7	216.4
day schools	198.5	211.6	218.8	217.0	210.2
evening schools, including correspondence students	19.1	11.5	6.6	6.7	6.2
Vocational schools	16.7	20.8	17.8	18.1	30.7
Specialized secondary schools	23.9	22.2	18.6	16.3	
Higher schools	25.5	23.5	25.9	25.6	24.5

Table 3. Number of students per 10,000 inhabitants (at the beginning of school year)

	1980/81	1985/86	1990/91	1991/92	1992/93
General education schools	1466	1447	1434	1421	1375
among this in grades 10-12	313	257	202	201	195
Specialized secondary schools	161	144	118	104	93
Higher schools	172	153	164	163	156

Table 4. Number of graduates from educational institutions (1000 people)

	1976-1980	1981-1985	1986-1990	1990	1991	1992
Graduate from basic schools	100.7	97.1	99.4	18.9	19.2	19.1
Graduates from secondary schools	73.7	71.0	59.9	10.4	10.6	
Graduates from vocational schools	10.1	14.7	20.7	4.4	7.3	
Graduates from specialized secondary schools	27.9	28.1	25.2	4.7	4.6	{12.1
among them on the basis of basic schools	17.1	13.5	11.8	2.3	1.7	
Graduate from higher schools	17.0	18.4	15.3	3.1	3.0	3.0

The Estonian educational system replenishes the labour market every year, from whom 16% have higher education, 20% specialized secondary, 30% vocational and the rest general education (incl. those who have discontinued the studies in higher school, specialized secondary school or vocational school).

Table 5. Number of specialists graduated from specialized secondary schools (by specialties)

	1988	1989	1990	1991
Total graduates	5099	4854	4747	4597
from this				
economics and planning	496	526	398	333
law and business management	149	154	170	140
exploitation of mineral deposits	47	43	32	64
energetics	57	45	58	36
engineering and metal processing	187	198	180	155
automobiles and tractors	141	143	150	132
exploitation and maintenance of machinery and equipment	190	163	169	171
electrical engineering	76	62	85	75
automation and maintenance of means of automation	59	67	54	52
computing machinery and automatized systems	116	98	138	142
radio engineering and communication	87	128	138	91
maintenance of transport	110	148	104	89
chemical technology	26	34	34	31
forest and wood processing	88	92	89	72
technology of foodstuffs	104	103	97	126
technology of consumer goods	211	140	158	206
design and construction	194	180	169	142

Table 6. Number of graduates from higher schools by specialties

	1988	1989	1990	1991
Total graduates	2706	2977	3129	3000
among them				
natural sciences	157	194	172	198
general economic specialties	303	361	285	358
engineering-economic specialties	282	214	246	221
geology and exploration of mineral resources	4	12	12	7
processing of mineral resources	3	20	3	14
energetics	30	48	41	37
engineering and metal-working	16	52	36	48
automobiles and tractors	12	55	39	35
apparatus engineering	7	25	25	24
electrical engineering	9	29	17	25
automation	64	80	81	64
computing technics	29	50	49	46
radio engineering and communication	13	23	38	22
chemical technology	24	28	20	13
forest and wood processing	7	21	20	22
technology of foodstuffs	71	91	94	75
technology of consumer goods	13	20	17	16
construction and design	85	140	113	127

Table 7. Number of Doctors, Candidates and Masters of Arts in sciences in 1991

	Doctors	Candidates	Masters of Arts
Total	336	2308	36
among them			
physics-mathematics	46	316	-
chemistry	16	152	-
biology	38	221	-
geology-mineralogy	10	49	-
technics	40	515	5
economics	25	195	-
law	3	29	-
pharmacology	-	5	-

Table 8. Number of M.A. candidates (postgraduates) by sciences

	1980	1985	1990	1991
Total	456	550	417	388
among them				
physics-mathematics	50	54	22	26
chemistry	26	30	16	15
biology	34	50	33	15
geology-mineralogy	7	9	10	1
technics	112	124	65	103
economics	60	76	51	48
law	14	6	3	6
pharmacology	2	1	-	-

These figures characterize the general situation of the moment in Estonia. Though Estonia is a small country, there are still regional peculiarities. So in the university cities, Tallinn and Tartu, the share of people with higher education is higher than in distant regions from these centres. The location of people with vocational education is just as unequal, to some extent following the location of vocational schools in Estonia. At the same time, the distribution of specialists with secondary education is rather even in different regions. This situation can be explained by the network of respective educational institutions. Specialized secondary schools are located much more evenly in Estonia than vocational schools.

In the Estonian educational system the most widely studied languages by young people are English, German and Finnish.

In recent years great progress has been made in computer instruction. Practically all young people with secondary education have received the respective elementary instruction.

The structural crisis due to the regaining of independence and the transition to a market economy has not caused a very great recession in the Estonian educational system either. At the beginning of the school year of 1992/93, there were 821 educational institutions (by 66 or 10% more as compared with the beginning of the school year of 1990/91) in Estonia, from this 691 (+50, +7.8%) general education day schools, 24 (-3, -1.1%) general education evening (with shifts) schools, 92 (+11, +13.6%) vocational schools and 14 (+8, +133%) higher schools.

The total number of students was 271569 (by 16178 or 5.6% more than at the beginning of the school year of 1990/91) at the beginning of the school year of 1992/93, among this 210191 (-8616, -3.9%) students of general education day schools, 6227 (-365, -5.5%) of general education evening schools, 30687 (-5762, -15.8%) of vocational schools and 24464 (-1435, -5.5%) of higher schools.

In 1992 19121 people (122 per 10,000 inhabitants) acquired basic education (9 grades), 13265 (85) secondary education, 12101 (77) vocational education and 2988 (19) higher education.

III.4. Dependence on foreign raw materials and intermediate products

The newly independent Republic of Estonia inherited industry which was mostly producing goods from imported raw materials for the Eastern market. Though by today the industrial structure has somewhat changed already, many Estonian manufacturing enterprises depend on imported raw materials and semimanufactured products. The dependence is the highest in engineering and metal industry, chemical and light industry, lower in forest, wood, pulp and paper industry, building materials and food industries. And this is quite a normal situation both at the moment and in the future. In the contemporary open world no country - especially a small country like Estonia - can develop industrial production without foreign raw materials and semimanufactured products.

The imports of main raw materials and semimanufactured products in the first half-year of 1993 are produced in Table 1. It is to be mentioned that with respect to many goods it is very difficult methodologically to determine whether they are imported for industrial raw material or for some other purpose.

Total imports of main raw materials and semimanufactured products were 2.44 billion kroons (54.9% of the total imports) in the first half year. Major imports were oil products (18.9%); machinery, electric machinery and their parts (16.3%); metal products (4.3%). Considering that in the first half-year of 1993 the output had decreased by 34.7% (due to the structural crisis in the Estonian industry) compared to the same period in previous year, the imports of main raw materials and semimanufactured products was much smaller than previously. The decline for that reason has been the biggest in the imports of production materials for chemical industry and engineering and metal industry.

The statistics of the first half-year of 1993 does not cover the structure of imports of raw materials and semimanufactured products from individual countries. Selective studies and interviewing of experts enable to state that the share of Russia and other CIS countries in the imports of main raw materials and semimanufactured products is somewhat higher (about 35%) than in total imports (27%). This situation also is quite logical for the following reasons:

- in Eastern markets the raw materials are cheaper still;
- many large-scale enterprises have used Eastern raw materials for decades and continue to do it from habit or inertia;

Table 1. Imports of main raw materials and semimanufactured products in the 1st half-year of 1993

Products	Imports	
	EEK thous.	% of total
Sugar	86861.8	2.0
Cacao and cocoa products	63985.4	1.4
Tobacco	45975.9	1.0
Mineral fuels; mineral oil; their distillation products; bituminous substances, mineral wax	840353.2	18.9
Anorganic chemicals; organic or anorganic compounds of precious metals, rare earth metals, radioactive elements or isotopes	14713.4	0.3
Organic chemicals	22698.2	0.5
Tanning and colour extracts; tannic acid and derivatives; pigments; paints, dyes and varnish; putty and other mastics; printer's ink	41548.0	1.0
Explosives, pyrotechnical products, pyroforic alloys, some combustible preparations	22926.1	0.5
Various chemical products	16410.1	0.4
Plastic and products from it	122764.7	2.7
Rubber and rubber products	25685.5	0.6
Raw hide and leather	16026.6	0.4
Silk	4490.3	0.1
Sheep's and other wool; coarse animal's hair; thread and material from horsehair	42012.9	0.9
Synthetic artificial fibre	65601.6	1.5
Chemical staple fibre	61998.5	1.4
Wadding; felt and nonwovens; special yarns and ropes and leather products	12749.1	0.3
Woven special fabric; finishing materials	17560.9	0.4
Impregnated, coated or laminated textile; textile products for manufacturing	13965.8	0.3
Stockinet fabric	18167.1	0.4
Ferrous metal	47273.6	1.1
Products from ferrous metal	71770.2	1.6
Copper and products from it	5303.3	0.1
Nickel and products from it	2866.4	0.0
Aluminium and products from it	15950.5	0.4
Zinc and products from it	7154.8	0.2
Lead and products from it	183.7	0.0
Other nonferrous metals, metal ceramics	664.3	0.0
Tools from nonprecious metal	13422.8	0.3
Machines and their parts	476828.8	10.7
Electric machines and their parts	246970.3	5.6
Total	2444881.8	54.9

- as many Estonian manufacturing enterprises (especially engineering enterprises) were essentially departments-subsidiaries of Russian factories, they have had to use semiproducts (loops, components, completable semi-manufactured products);
- consumer goods of the CIS countries are not able to compete the respective Western products in the Estonian market.

The dependence of the Estonian industry on imported raw material and semimanufactured products will not decrease in the near future. The opposite is more likely - in connection with the growth of production the need for raw materials will increase. But the reorientation from Eastern to Western markets will continue in the future.

IV. DEMAND CONDITIONS

IV.1. Current situation in the domestic market

Domestic market can be conventionally divided into consumer goods market and means of production market. Situation in the commodity market depends greatly on personal money incomes as well as on the number of tourists, especially commercial tourists. The situation in the means of production market depends on investments in the economy.

In July 1993 the money income per capita was estimated at EEK 784.71 and expenditures at EEK 732.62. The structure of expenditures is given in Table 1.

Table 1. Structure of expenditures by inhabitants in July 1993

Kind of expenditure	Expenditure	
	EEK	%
Total expenditures	732.62	100.0
among this		
Total goods and services	577.76	78.9
- Food	249.11	34.0
- Alcoholic beverages and tobacco	19.77	2.7
- Manufactured goods and services	308.88	42.2
from this		
1. wardrobe goods	37.76	5.2
2. durable goods	14.74	2.0
3. housing	69.46	9.4
4. transport	57.34	7.8
Investment	33.65	4.6
Taxes	121.21	16.5

The cost of minimal amount of food satisfying physiological needs was EEK 228 (31.1% of money incomes) in July, 1993, and actual expenditures on food EEK 249.11 (34.0% of money incomes). It appears from these data that the Estonian population spends about one third of the incomes on food at present.

Considering the relatively high taxes, expenditures on housing and transport, as well as investments 5.2% is left for wardrobe goods (EEK 37.76), 2.0% for durable goods (EEK 14.74) and 2.7% for alcoholic beverages and tobacco (EEK 19.77).

Based on that, the domestic purchasing power can be estimated as extremely low as of present. It is to be presumed that such a situation will continue in the near future and the consumption structure will change quite slowly. But still, the bottom has been overcome by now. The official statistics show that in between October 1992 and June 1993 the average monthly wage increased 42% in Estonia, consumer price index 30% only. In connection with the fast social stratification the luxury goods market will probably continue to increase.

In the first half-year of 1993, the number of tourists has considerably increased compared to the last year. According to incomplete data, Estonia was visited by 334,000 tourists (290,000 from Finland, 15,500 from Sweden, 8750 from Germany, 2600 from the USA, 2150 from Denmark etc.). According to expert estimates, many tourists made a lot of shopping (especially from Finland) in Estonia.

In the first half-year of 1993, the Estonian retail turnover was EEK 3010.5 million (Table 2), prices of goods 2.5 times higher and retail turnover (at comparable prices) 15.5% bigger than in the first half-year of 1992. In June 1993 retail turnover was EEK 602.2 million (28.3% bigger than in January and 6.8% bigger than in May).

Shifts toward increase in retail turnover are obvious, but experts are of the opinion that the low capacity of the domestic market will continue to cause headache to Estonian manufacturing and trade enterprises for a long time.

The present situation in the means of production market, which depends highly on the investment in the economy, is even more difficult to be defined. Somewhat reliable statistics can be found only on industry. According to the Statistical Office (uncontrolled data) real investments were EEK 266.3 million in manufacturing (from this construction works EEK 78.2 million and equipment, machinery and inventory EEK 178.3 million) and in mining EEK 15.7 million (from this constructions EEK 6.9 million and equipment, machinery, inventory EEK 8.8 million) in the first-half-year of 1993. In the same period EEK 208.7 million worth of fixed assets were put into exploitation in manufacturing and EEK 8.2 million in mining. In other branches of economy investments were even smaller. It is to be considered also that besides the low profitability of enterprises the Estonian means of production market has been reduced also by the shortage of circulating media.

Table 2. Retail and catering turnover in the 1st half-year of 1993

	Turnover EEK thous.
Total retail turnover	3010523
turnover of retail trade enterprises	2975652
- food	1638908
- foodstuffs	1318838
- alcoholic beverages and tobacco	320070
- manufactured goods	1336744
- ready-made clothes, footwear and cloth	219839
- motor vehicles, their spare parts and fuel	512101
- other goods	604804
retail turnover of other enterprises ¹	34871
Cateringturnover	261387

1) Sale of goods by catering and service establishments for whom it is their main activity.

As of July 1, 1993, there were 4052 enterprises with foreign capital participation in Estonia. The capital invested in them totalled EEK 6.93 million. This foreign capital has raised demand also in the Estonian means of production market (building materials, construction-installation works, as well as some equipment etc.). And it seems that the Estonian means of production market will depend just on foreign investments as well as on foreign loans in the near future. Considerable investments by the domestic capital, which may essentially increase the Estonian means of production market, can happen only after several years.

IV.2. Present situation in export markets

The Estonian economy has quickly reoriented itself from the Eastern market to Western market and increased exports. In the first half-year of 1993, when the Estonian exports totalled 4.3 billion kroons (Table 1), major export articles were dairy, meat, and fish products; metals; timber, wood products and furniture; machines and their parts; sewing products; cotton cloth.

In the first half-year of 1993 Estonia exported goods to 81 countries (Table 2), but over two-thirds (67.4%) of the exports were to five countries (Finland 22.8%, Russia 18.8%, Sweden 10.9%, Germany 7.9% and Latvia 7.0%).

The share of the CIS countries was below 27% in the total exports of Estonia in the first half-year of 1993. Thus, the dependence of Estonia on the Eastern market has declined to the level, which was in Finland in the peak years (26%). Due to the difficulties in settling accounts the role of Russia and other CIS countries (rouble zone countries) in Estonian trade will continue to decline. Russia will probably fall as a foreign trade partner of Estonia to the fourth place after Finland, Sweden and Germany by summer 1994. In all likelihood, the role of Russia in Estonian trade will start growing again after the stabilization of Russian economy.

Considering the fast structural changes in the Estonian economy and the passing of the depression in the Western economy, the Estonian export potentials may be considered promising in perspective.

Table 1. Estonian exports of goods in the first half-year of 1993

Product	Exports	
	EEK thous.	%
Group I	588481.0	13.7
Livestock	16096.3	0.4
Meat and edible subproducts	58000.5	1.4
Fish and shellfish; mollusks and other aquatic invertebrates	159733.1	3.7
Milk and dairy products; bird's eggs; natural honey; other food products	354244.1	8.2
Other animal products	407.0	0.0

Table 1. Continued

Product	Exports	
	EEK thous.	%
Group II	25846.1	0.6
Living trees and other plants; bulbs, roots etc; cut flowers and decorative plants	3300.6	0.1
Vegetable and edible roots and tubers	1366.5	0.0
Edible fruits; berries and nuts; peels of citrus fruits and melon	6019.1	0.2
Coffee; tea; spice and sweet herbs	2422.7	0.1
Grain	1150.4	0.0
Flour; groats and pearl barley; starch; inulin; wheat protein	4172.1	0.1
Oilseed and crops; other seeds and crops; plants used as raw material in perfumery and pharmaceutical industry; straw; hay; feed crops	5848.1	0.1
Shellack; gum resin; resin and other plant juices and extracts	845.0	0.0
Plant materials for weaving; other plant products	721.6	0.0
Group III	20976.3	0.5
Animal and vegetable fat and oil; their fractions; various food fats; animal and plant wax	20976.3	0.5
Group IV	306878.0	7.2
Meat products; fish and shellfish products; products from mollusks and other aquatic invertebrates	155019.1	3.6
Sugar and confectionery from sugar	19437.5	0.5
Cacao and cocoa products	51755.6	1.2
Products from grain; flour; starch and milk; confectionery from flour	2487.9	0.1
Products from vegetables and fruits; nuts and other parts of plants	10910.3	0.3
Various food products	6330.5	0.1
Refreshing and alcoholic beverages; vinegar	38609.2	0.9
Residues and waste from food industry; ready-made food for animals	13001.3	0.3
Tobacco and industrial surrogates for tobacco	9326.6	0.2
Group V	341294.7	7.9
Salt; sulphur; soils and rocks; plastering materials; lime and cement	25331.3	0.6
Ores; scoria and ash	10384.2	0.2
Mineral fuels; mineral oil; their distillation products; bituminous substances; mineral wax	305579.2	7.1
Group VI	203328.6	4.7
Anorganic chemicals; organic or anorganic compounds of precious metals; rare earth metals; radioactive elements or isotopes	54185.6	1.3

Table 1. Continued

Product	Exports	
	EEK thous.	%
Organic chemicals	40795.9	1.0
Pharmaceutical products	26826.5	0.6
Fertilizers	29212.1	0.7
Tanning and colour extracts; tannic acid and derivatives; pigments; paints, dyes and varnish; putty and other mastics; printer's ink	22630.5	0.5
Ethereal oil and resinoid (dry perfumery); perfumery, cosmetic and toilet products	7856.5	0.2
Soap; organic surface active substances; washing materials; lubricants; synthetic wax; polishing and cleansing agents; candles and other analogous products; carving pastes; denture paraffin; and gypsum mixtures used in dental care	4617.5	0.1
Protein; modified starch; glues; enzymes	6023.7	0.1
Explosives; pyrotechnical products; matches; pyroforic alloys; some combustible preparations	5921.3	0.1
Photographic and cinematographic goods	1404.1	0.0
Various chemical products	3854.9	0.1
Group VII	54418.4	1.3
Plastic and products from it	42569.0	1.0
Rubber and rubber products	11849.4	0.3
Group VIII	65091.7	1.5
Raw hide (excl. pelts) and leather	39115.2	0.9
Leather products; saddlery and harness; travelling requisites; handbags etc. products; products from animal intestines	8679.2	0.2
Fur and imitation fur; products from them	17297.3	0.4
Group IX	372396.3	8.7
Timber and wood products; charcoal	372164.4	8.7
Cork and products from it	1.5	0.0
Products from straw and other wicker materials; basketry and wickerwork	230.4	0.0
Group X	21002.3	0.5
Pulp and cellulose from timber or other plant fibre; paper and cardboard residues	2771.3	0.1
Paper and pasteboard; products from pulp; paper or pasteboard	15201.9	0.4
Books; newspapers; prints and other printed matter; manuscripts; typewritten texts and plans	3029.1	0.0
Group XI	520086.3	12.1
Silk	19.1	0.0

Table I. Continued

Product	Exports	
	EEK thous.	%
Sheep's and other animal wool; course animal hair; thread and material from horsehair	2587.2	0.0
Cotton	137387.2	3.2
Other plant synthetic fibre; paper yarn and cloth from it	1658.7	0.0
Synthetic and artificial fibre	7144.3	0.2
Chemical staple fibre	2676.6	0.1
Wadding; felt and nonwovens; special yarns and ropes and leather products	13025.2	0.3
Rugs and textile carpetings	20055.0	0.7
Woven special fabric; teased fabric; lace; tapestry; embroidery; finishing materials	1512.2	0.0
Impregnated; coated or laminated textile; textile products for industry	5237.7	0.1
Knitted fabric	347.6	0.0
Clothes from stockinet (incl. handknitted and crocheted)	85147.4	2.0
Clothes and accessories	170568.4	4.0
Other textile finished products; suits; second-hand clothes and textile articles; rags	64719.7	1.5
Group XII	45609.3	1.0
Footwear and related products; parts of these products	3899.7	0.9
Headgear and their parts	5431.7	0.1
Umbrellas; sunshades; walking sticks; whips; horsewhips; their parts	204.9	0.0
Treated feathers and products from feathers or down; artificial flowers; products from hair	975.2	0.0
Group XIII	77762.4	1.8
Products from stone; gypsum; cement; asbestos; mica etc.	32059.0	0.8
Ceramic products	5778.4	0.1
Glass and glassware	39925.0	0.9
Group XIV	71710.7	1.7
Natural and cultivated pearls; precious and semi-precious stones; precious metals; metals coated with precious metals; products from them; imitation jewelry; coins	71710.7	1.7
Group XV	527295.0	12.3
Ferrous metal	102776.1	2.4
Products from ferrous metal	73225.5	1.7
Copper and products from copper	93130.3	2.2
Nickel and products from it	133200.1	3.1
Aluminium and products from it	22583.8	0.5
Lead and products from it	490.1	0.0
Zinc and products from it	2093.6	0.1
Tin and products from it	965.1	0.0

Table 1. Continued

Product	Exports	
	EEK thous.	%
Other nonferrous metals; metal ceramics	87556.7	2.0
Tools; cutlery; spoons and forks from nonprecious metal; their parts	6324.2	0.2
Various products from nonprecious metals	4959.5	0.1
Group XVI	295448.6	6.9
Nuclear reactors; boilers; machines and mechanical fittings; their parts	154526.7	3.6
Electric machines and fittings; their parts; audio-recording equipment; their parts and supplementary devices	140921.9	3.3
Group XVII	449682.5	10.5
Railway or tram locomotives; rolling stock and their parts; equipment for railway or trams; their parts; every kind of mechanical (incl. electro-mechanical) signalling equipment	2188.7	0.0
Road transport vehicles; their parts and supplementary devices	416932.5	9.7
Aircrafts; space crafts; their parts	2226.9	0.1
Vessels; boats and floating construction	28334.4	0.7
Group XVIII	67633.5	1.6
Optical; photographic; cinematographic; measuring; control; precision; medical or surgical instruments and apparatuses; their parts and devices	56072.8	1.3
Clocks and watches; their parts	305.9	0.0
Musical instruments; their parts and accessories	11254.8	0.3
Group XIX	2054.3	0.0
Arms and munitions; their parts and accessories	2054.3	0.0
Group XX	228707.3	5.3
Furniture; mattresses; mattress springs; pillows and other stuffed furniture accessories; other lamps; illuminated signs etc.: prefabricated constructions	197975.1	4.6
Games; toys; sports equipment	27802.9	0.6
Various manufactured products	2929.3	0.1
Group XXI	9460.8	0.2
Works of art; collections and antiquities	9460.8	0.2
Total	4295164.1	100.0

Table 2. Estonian exports to different countries in the 1st half-year of 1993
(in order of importance)

Country	Exports	
	EEK thous.	%
Total exports	4295164.3	100.0
from that		
Finland	978265.2	22.8
Russia	808163.1	18.8
Sweden	468601.7	10.9
Germany	337360.2	7.9
Latvia	300584.1	7.0
Netherlands	229648.5	5.3
Ukraine	143584.1	3.3
Lithuania	102825.9	2.4
Denmark	94079.9	2.2
USA	86784.2	2.0
UK	59464.5	1.4
Kazakhstan	58453.0	1.4
Poland	57790.8	1.3
Byelorussia	45313.3	1.1
Mauritania	45160.9	1.1
Namibia	42537.8	1.0
Italy	33585.9	0.8
Czechoslovakia	31896.8	0.7
Turkmenistan	31370.2	0.7
Switzerland	22520.6	0.5
Hungary	22063.7	0.5
Azerbaijan	21157.5	0.5
Norway	20310.6	0.5
China	19514.8	0.5
Egypt	19321.9	0.4
Japan	18526.6	0.4
Tadjikistan	17338.0	0.4
Uzbekistan	16767.0	0.4
Bulgaria	12601.8	0.3
Belgium	11580.1	0.3
France	11506.6	0.3
Austria	10389.1	0.2
Portugal	8872.0	0.2
Greece	8733.5	0.2
Moldova	8695.4	0.2
the United Arab Emirates	6543.8	0.2
Canada	6256.2	0.1
Armenia	4565.4	0.1
Korea PDR	4098.2	
Taiwan	3931.2	
Turkey	3653.8	
Brazil	3502.7	
Kyrgyzstan	3412.6	
Gambia	3142.1	
Yugoslavia	2484.8	

Table 2. Continued

Country	Exports	
	EEK thous.	%
Rumania	2471.3	
Ireland	2312.4	
Afghanistan	2046.8	
Iceland	1788.3	
Spain	1697.9	
Sudan	1320.5	
Israel	1296.9	
Georgia	1281.5	
The US Virgin Islands	698.5	
Argentina	598.9	
Liechestein	499.4	
Libya	396.5	
Hong Kong	386.5	
Cyprus	361.8	
Korea	354.8	
Yemen	247.2	
Guinea	232.7	
Thailand	216.6	
Australia	172.9	
Angola	144.6	
Tunisia	84.8	
Mexico	61.5	
Montserrat	60.0	
Peru	41.2	
Fiji	30.6	
Ghana	30.0	
Greenland	16.9	
Lesotho	13.6	
India	12.4	
Luxembourg	9.6	
Iran	6.8	
Singapore	2.9	
Mauritius	2.5	
Saint Vincent and the Grenadines	2.1	
Tokelau	0.5	
Bolivia	0.2	

V. OTHER FACTORS INFLUENCING INDUSTRIAL ACTIVITIES

V.1. *Organization of foreign trade*

Estonia is a small country, who objectively has to develop cooperation with foreign countries, i.e. seek ways for the integration into the world economy. (In countries with large population, territory and domestic market foreign trade plays not nearly so important role).

Effects resulting from the status of a small country divide into positive and negative effects. Negative effects are as follows.

1. Mass production lacks advantages, wherefor the output level of a firm of technologically optimal size exceeds the needs of the domestic market in many spheres. It means that these firms depend essentially on export opportunities, openness, stability and development tendencies of the external markets. In Estonia this problem is specially acute due to the large-scale industry of the former Soviet Union times, which has lost the majority of its traditional Eastern market. Its replacement with the highly competitive Western markets proves for many enterprises impossible, primarily due to the low quality of production. The low capacity of the domestic market also is the reason for the lack of interest of foreign investors, until there are no safe and well-functioning export markets.
2. Hazard of monopolization, because several enterprises have not enough room in the Estonian market in many industries. Enterprises in monopolistic position may, by the help of monopoly prices, redistribute possible profit from entrepreneurship for their benefit and thus significantly deform the economic development. The negative effects of monopolization can be avoided or at least alleviated by the openness of the domestic market for the respective imports. There should be no import restrictions in monopolistic industries.
3. Hazard of price cartels in the markets with only two-three suppliers.
4. Great influence of international firms due to the fact that a subsidiary located in a small country is backed by the whole capacity of the parent firm. Local competitors are easily suppressed by the help of dumping prices introduced with the financial aid from the parent firm and the monopolistic position is gained. Foreign firms usually create also a strong political lobby. In a small country it is much easier (cheaper) than in a large one.
5. Great dependence on imports is an enemy of national sovereignty in the world, where economic embargo or other such measures are used for political reasons.
6. Excessive specialization of exports and concentration to few countries, which may lead to a foreign structural dependence. A small country has only a few industries where it has advantages in world economic competition. Specialization in these industries is of course expedient from the viewpoint of economic efficiency. But the changing of the economic structure is a

long-time process. A sharp change in the management conditions creates much more serious problems in the strictly specialized economy than in a broadly differentiated economy.

The export concentration to a few countries has analogous effects. For example, in the 1 half-year of 1993 Estonia exported goods to 81 countries, but over a third (67.4%) of the exports was to five countries (Finland 22.8%, Russia 18.8%, Sweden 10.9%, Germany 7.9% and Latvia 7.0%). A small country often has to do it, because it lacks opportunity to open agencies and obtain information in many countries. Thus the exports market becomes dependent on the economic and political situation in those few destination countries. Difficulties in the exports market of a high share country are borne fast through the export branch to the whole economy of a small country.

7. A small country cannot essentially influence prices, exchange rates, interest rates and other economic key rates - they fluctuate in harmony with the changes in external environment. This makes the whole economy of a small country dependent on the world economy (foreign countries) situation.

8. Lack of specialists with adequate qualification in many industries.

There are much less positive aspects ensuing from the status of a small country than the negative ones.

1. The domestic market of a small country is more homogenous, which makes it more comprehensible for the economic subjects and also more easily controllable by the state. As the Estonian economy is to a large extent an eclectic set of enterprises torn out from the Soviet Union economic complex, this advantage cannot be realized in the near future. In Estonia an integral economic complex and the domestic market have still to be formed.

2. Flexibility of reacting to external influence is higher in the markets of a small country. It is due to the fact that smaller enterprises are in itself less inert and a small domestic market does not enable to compensate for the external effects. In Estonia the main problem in this sphere is the inertia of large enterprises based on state property. This advantage will be realized in the full extent after the privatization of state-owned large enterprises.

3. A small country may by the help of price concessions fight for itself a place in the balanced market without reducing the general price. This tactics however gives positive results only so long as this small country alone uses this method.

4. A small country may bargain for itself more advantageous trade conditions compared with other countries, because the leading market forces are not afraid of competitors.

In the transition from the planned to a market economy the Republic of Estonia desisted from the state administration of foreign trade. At present the foreign trade is mainly influenced by customs and tax policy. A major role is played by

- advising on markets and sales;

- crediting of the organizations which organize sales and help to create necessary markets.

Four institutions are mainly engaged in foreign trade organization in the Republic of Estonia.

1. Department of foreign trade policy of the Ministry of External Affairs.
2. Foreign trade department of the Ministry of Economy.
3. Estonian Chamber of Commerce and Industry.
4. Confederation of Estonian Industry.

The task of the department of foreign economic policy of the Ministry for External Affairs is to prepare international economic agreements and create favourable conditions for foreign trade. It also intermediates international research programmes, training programmes, etc.. Individual problems are its concern only in exceptional cases.

The fields of activity of the foreign trade department of the Ministry of Economy are as follows:

- elaboration and implementation of general and regional foreign trade policy, issues of international trade collaboration;
- preparation of international trade agreements and control over their implementation;
- participation in the work of international trade organizations and collaboration commissions ensuing from agreements;
- cooperation with the economic (commercial) agents of the foreign embassies in Estonia, as well as with those of Estonian embassies abroad;
- elaboration of the principles of export credit and participation in the work of the board of export credit fund, keeping of respective statistics;
- elaboration of the concept of state assistance to the promotion of export and looking through the applications for state support;
- registration of the agencies of foreign firms, collaboration with them, keeping of the respective statistics;
- analysis of the situation in foreign trade, composition of the estimate and forecasting of foreign trade development;
- initiating of the research in foreign trade;
- initiating of the elaboration of legislative acts regulating foreign trade.

The tasks of the trade policy office of the foreign trade department are:

- collaboration with international trade organizations (GATT, EC, UNO, IMF, EFTA) in commercial issues;
- elaboration and implementation of national foreign trade policy trends, realization of the regional trade policy;
- collaboration in foreign trade issues, preparation of trade agreements, control and analysis of the observation of agreements;
- participation in the work of collaboration commissions in international trade;
- participation in the work of the commission coordinating foreign aid;
- participation in the elaboration of foreign trade policy measures (customs duties, quotas, licenses).

The tasks of the international trade relations office of the foreign trade department are:

- participation in the work of international economic organizations;
- elaboration and implementation of foreign trade trends of the state, realization of regional trade policy;
- participation in the work of international collaboration commissions in trade;
- elaboration of foreign trade legislation for Estonia, analysis of legislative acts and agreements; interpretation and analysis of international commercial acts;
- participation in finding out dumping issues;
- preparation of foreign agreements, control and analysis of the observation of agreements concluded;
- representing the Ministry of Economy in international trade work groups and collaboration with trade representations of other countries in Estonia;
- organizing collaboration with trade representatives (attaches) of Estonia, unions, associations and other organizations engaged in Estonian foreign trade;
- organizing training in foreign trade.

The Estonian Chamber of Commerce and Industry (EKTK) is a non-state nonprofit organization, which unites and helps entrepreneurs. The purpose of its activity is to represent the Estonian entrepreneurs in the dialogue with the central and local government organs, help to raise the export potential of the industrial production of the Republic of Estonia, take part in the preparation of the legislation concerning entrepreneurship, intermediate various commercial information, render services and perform other tasks delegated to it by the state.

There have been created three large data bases about entrepreneurship at the EKTK. The data base of offers for collaboration of the commercial information department has a lot of users both among Estonian and foreign entrepreneurs. Through it one can find a collaboration partner, a reliable firm for investment, buyer for goods, etc.

The EKTK is a member of the Elexinfo, an information project of the Nordic Council. Elexinfo holds background data and descriptions of customs practices in 160 countries. Data on Estonia are prepared by the EKTK.

The third major data base of the EKTK is the data base of the Estonian company register, which contains information on 25,000 firms. All data bases of the EKTK are classified according to the NACE classification recommended by the European Community.

The EKTK issued a business reference book 1992/1993 in English, which have been distributed all over the world and which contains data about 1000 Estonian firms.

A regular publication is the newspaper "Kaubandus-Tööstuskoja Teataja" (Gazette of the Chamber of Commerce and Industry).

The EKTK has rapidly gained steady contacts with the business life in major regions of the world and has been useful for the Estonian entrepreneurs.

The Confederation of Estonian Industry regards the assisting of manufacturing enterprises in increasing the export of their production as one of its most important tasks. For that it organizes exhibitions, performs market research, exchanges information with employers' organizations of Western countries, issues materials introducing Estonian industry and its production, etc. Several concrete programmes are under way and organization also in unions of industries.

As it appears from the above, several institutions are occupied with foreign trade organization in the Republic of Estonia. There is for sure some irrational organization of this work and duplication, but there are no essential conflicts between them. The purpose of all these institutions is the deeper integration of Estonian industry into the world economy.

The success of Estonia in reorienting its trade to the West reflects partly the favourable terms the Estonian goods have gained for the access to the western markets. As of September 1993 Estonia had concluded free trade agreements with Norway, Sweden, Finland and Switzerland. The main benefit of these agreements is that they ensure Estonian manufactured goods duty free access to the respective EFTA countries, creating for these goods conditions for increasing trade. Estonia is treated by the EC, USA and Canada according to the GSP (Generalized System of Preferences) principles, it has the agreements of the MFN (Most Favoured Nation) with the EC and USA.

These agreements usually neglect agricultural products (protection of agriculture by the advanced industrial countries). There are still separate agreements concerning certain processed agricultural products in addition to the free trade agreements with Sweden and Norway and these products are discussed in the main part of the agreements with Switzerland.

Main benefit from the agreements for Estonia is that it can on equal terms compete with other countries, and that it is not left so-called outside of the club.

Free trade agreements with industrial countries provide also indirect advantages. Relationship with a foreign partner based on a contract in terms of trade also is a powerful weapon against the pressure groups seeking domestic protection and thus ensure the permanence of liberal trade policy. Agreements concluded with the Nordic and EFTA countries are a legal obstacle which the government can refer to while motivating the invalidity of the customs fees in response to the protectionist pursuits by the Estonian industry and agriculture.

The whole foreign trade organization proceeds from the principle that the West is the natural trade partner for Estonia. Free trade agreements with the EFTA and EC countries would have positive effect on Estonia. Tariffs on most of the manufactured goods are low already, what means that goods have to be produced at internationally competitive prices.

The World Bank is of the opinion in the report on the Estonian trade and tax policy as of August 1, 1993 that Estonia has to develop better access to the Western markets, including join the GATT and increase cooperation with EFTA and EC.

V.2. *Transport and communications*

The Estonian transport system consists of road, railway, sea, air, river and pipe-line transport, in Tallinn also electrified city transport (trams and trolley buses). From the viewpoint of international traffic the four first-mentioned modes of transport (road, railway, sea and air transport) are important at present.

Due to its favourable geographical position Estonia has good transport connections with other countries, as well as opportunities for intermediating transit both between east-west and north-south.

Good transport connections and possibility of transit favour the development of Estonian industry in every way. Therefore we discuss in this section only the general situation in the Estonian transport and its development perspectives without more exhaustive analysis of the transport statistics.

Estonia has three large ports in the region of Tallinn - Muuga, Central and Kopli, which are relatively long ice-free and with great depths. In perspective it is possible to reconstruct ports for international transport also in Pärnu, Paldiski and Kunda. Estonia also has a good roads and railway network, which enables to transport goods arriving through ports both to east and south, as well as to transport goods arriving from these directions to the ports. For international transport, it is essential to improve road cover, develop road-side infrastructure, raise railway capacity and traffic safety.

At present there are two international airfields in Estonia: Tallinn and Tartu. Five more airfields have become free from the Russian air force, which creates good opportunities for the development of international passenger and cargo transport.

The network of inland waterways is not much developed in Estonia. International traffic possibilities are on Lake Peipsi (between Estonia and Russia). The major inland port is the Tartu river port.

Tallinn will remain the junction of international importance for all modes of transport also in the future.

In West-Estonia, Pärnu has the makings of a perspective transport junction (if to develop port and airport there).

The project of building a new port in Kunda is also under elaboration (construction works are already going). If it is realized, another transport junction of interest for the international freight traffic may come into being in the North-Estonian coastal area.

Tallinn, Tartu and Ämari airfields also have preconditions to become junctions of international air transport. Tallinn may become a great passenger transport junction, Tartu and Ämari freight transport serving airfields.

Estonia has, due to its position, preconditions to become a intermediary of transit between three large geographical-economic regions:

1. East, comprising Russia and regions behind it;
2. North, comprising Finland and Scandinavian countries;
3. South, comprising Central and South-European countries.

As some of the north region countries belong by several features also to the Central Europe (Denmark, South-Sweden), they are often discussed also in the composition of the south region or the three regions are supplemented with the fourth one - the west region.

Transit transport corridors through Estonia form according to this classification:

1. East - West
2. North - South

All routes from Estonia to Russia are essentially east-western directional traffic corridors. (Tallinn - Narva road, Tallinn - Tartu - Luhamäe road, Narva - Tallinn - Paldiski railway, Petseri - Tartu - Tallinn railway).

In air transport east-western directional corridor is Slantsy - Võhma - Pärnu - Sorla air corridor.

There are two north-southern directional road transport corridors:

1. Via Baltica
Tallinn - Pärnu - Riga, which in perspective may become an important and widely used international road transport route;
2. Via Hanseatica
St.Petersburg - Narva - Jõhvi - Tartu - Valga - Riga, which will become the shortest and most interesting road for the motor traffic, East- and South-Estonian road-users and tourists from northern regions of Russia through the Baltic states to the Kaliningrad Oblast and Poland.

In railway transport, there are two north-southern directional traffic corridors running through Estonia:

1. Tallinn - Tartu - Valga;
2. Tallinn - Pärnu - Mõisaküla.
The north-southern directional air corridor is that from Finland over Tallinn and Võhma to Latvia and Lithuania and from there on southward.

The present state of the Estonian communication linkages and development projects should in every way promote the development of industry. The telephone network (and also telefax) is working satisfactorily, digital network also is under construction. About 80% of the Estonian territory, including all major towns, is covered with mobile telephone network. The capacity of the network is sufficient and everybody who wish may have a mobile telephone. Telefax and telegraph systems are also working quite satisfactorily, but their usage and share are declining steadily.

Thus we can see that good transport and communication linkages favour in every way foreign investment in Estonia and economic development on the whole.

V.3. *Environmental effects of production activities*

The Estonian industry is comparatively environment polluting, but due to the considerable decline in output levels the environmental problems have somewhat abated recently.

Pollution load by wastewater

Wastewater emission was 2692 mill.m³ in 1992, most of it (cooling water, etc.) needs no purification. Sewage water emission was 449 mill.m³, from this 427 mill.m³ was purified, 37% of the purified water did not satisfy the standards (insufficient purity). 111 mill.m³ of sewage water was purified biologically.

The continuing decline of production was accompanied by the decrease in sewage emission. Wastewater carried sewage into water bodies as follows:

BHTi	- 23500 tons;
oil products	- 154 tons
phosphorus	- 673 tons;
nitrogen	- 5835 tons;
phenols	- 82 tons.

The amount of water needing purification has diminished in Tallinn (from 147 to 123 million m³). BHT emission decreased from 23900 to 11900 tons. Decline in production is reflected also in the decrease in the pollution load in Kohtla-Järve, where the sewage water emission decreased from 27.5 to 22.6 mill.³. At the same time the BHT emission fell from 3800 to 1600 tons.

Tables 1-4 give a survey of the pollution load with wastewater in Estonia.

Table 1. Drainage of sewage water into rivers in 1990-1992

River	Amount of sewage water (mill.m ³ /year)			BHT (thous.t/year)		
	1990	1991	1992	1990	1991	1992
Pühajõgi	47.0	9.8	35.1	0.8	0.6	0.2
Purtse	69.0	65.4	68.3	4.6	2.9	1.8
Seljajõgi	4.1	4.1	3.1	0.7	0.5	0.3
Valgejõgi	1.1	1.1	0.9	0.2	0.1	0.1
Jägala	12.4	12.5	7.5	0.5	0.4	0.3
Kroodi brook	11.9	10.4	10.1	0.3	0.1	0.1
Narva	107.0	107.8	99.2	1.5	1.4	1.0
Kasari	2.9	3.1	2.7	0.2	0.6	0.2
Pärnu	10.5	10.3	8.9	2.4	1.8	0.9
Emajõgi	23.6	22.7	18.6	8.2	6.0	3.9
V-Emajõgi	3.6	3.0	2.6	0.2	0.1	0.1
Tänassilma	2.1	2.4	1.8	0.6	0.6	0.3
Põduste	1.6	1.1	0.1	0.9	0.2	0.0
Into all water bodies	536.0	534.0	446.0	45.2	44.2	23.5

Table 2. Waste water drainage in regions in 1992

City, county	Waste water emission	Needs purification	Un-purified	Purified	BHT (thous.t/year)
	(mill.m ³)				
Tallinn	127.5	123.1	2.7	120.4	11.9
Kohtla-Järve	22.6	22.6	1.8	20.8	2.4
Narva	901.5	35.6	0.8	34.8	0.8
Pärnu	21.8	5.4	0	5.4	0.2
Sillamäe	15.6	4.3	0.1	4.2	0
Tartu	11.2	11.2	10.8	0.4	2.3
Harjumaa	90.0	13.0	0.1	12.9	0.5
Hiiumaa	0.6	0.6	0	0.6	0.2
Ida-Virumaa	1371.0	190.9	0.1	190.9	0.4
Jõgevamaa	5.8	3.1	1.1	2.0	0.3
Järvamaa	14.4	4.8	0.4	4.4	0.5
Läänemaa	3.2	3.1	0.5	2.6	0.3
Lääne-Virumaa	54.1	9.3	3.0	6.3	0.9
Põlvamaa	2.6	2.6	0.2	2.4	0.1
Pärnumaa	3.5	3.0	0	3.0	0.2
Raplamaa	3.1	2.8	0.6	2.2	0.1
Saaremaa	5.2	2.2	0.1	2.1	0.1
Tarumaa	10.1	3.4	0.2	3.2	0.2
Valgamaa	3.4	3.2	0.1	3.1	0.2
Viljandimaa	5.0	5.0	1.8	3.2	0.7
Võrumaa	18.8	3.3	0.1	3.2	0.1
ESTONIA, TOTAL	2692	453	24.6	42.8	23.5

Table 3. Pollution load in 1990-1992 (tons)

Pollutant	1990	1991	1992
BHT	49000	44200	23500
oil products	322	286	154
sulphates	122000	109000	102000
chlorides	13000	16000	14600
P	792	909	673
N	7530	8230	5640
fats	443	169	146
phenoles	153	91	82

Table 4. Main indicators of water management in 1990 - 1992 (mill. m³)

Indicator	1990	1991	1992
Total draw of water	3300	3056	2709
- surface water	2720	2507	2221
- underground water	495	464	409
from water deposits	168	162	142
water from mines	328	302	268
mineral water	0.015	0.016	0.005
- sea water	85	85	79
Total use of water	2980	2773	2440
- in household	119	107	104
- in manufacturing	164	158	125
- cooling water	2440	2227	1985
- in agriculture	45	41	30
- in fish breeding	210	206	151
- other	8.8	23.5	45
Total emission of water	3260	3072	2692
- water that needn't be purified	2717	2534	2239
- water that needs to be purified	536	534	449
unpurified	39	30	21
purified	302	291	427
mechanically	...	...	203
biologically	...	...	111
physico-chemically	...	...	113
- into underground water	3.6	5.1	3.2

Air pollutant load

Official statistical accounts on air pollutants embrace all enterprises to whom the Ministry of Environment has issued a pollution licence. In 1992, 499 air pollution licences were issued, a report on air pollution was rendered by 620 enterprises. Each enterprise calculates the emission of air pollutants by him according to the methods approved by the Ministry of Environment. On the basis of them, the environmental departments of the counties draw up aggregates of the counties, the Ministry of Environment a national aggregate.

Solid particles (dust, soot) and gaseous SO₂, NO_x and CO account for 98% of the air pollutants from stationary pollution sources in Estonia. All air pollutants are divided into four classes of hazardousness. Especially hazardous to health and environment are pollutants of the 1st and 2nd class (NO₂ belongs to the 2nd class of hazardousness, SO₂, CO and solid pollutants to the 3rd and 4th class of hazardousness).

The emission of the air pollutants of the 1st class of hazardousness was 2.8 t in Tallinn (in 1991 91.3 t), 1.9 t in Rakvere (1991 - 8.3 t), and 0.1 t in Narva (1991 - 0.4 t); principal air pollutants are heavy metals (CrP₃, CO, Pb), benzopyrene, etc.

The emission of volatile organic compounds (VOC) was 11.2 t in 1992 (1991 - 16.5 t); these compounds produce photo-oxidants in troposphere (in air layers close to the soil), which are

hazardous to environment and human health. Emissions of VOC were the biggest in Kohtla-Järve (6.6 t), Sillamäe (1.6 t) and Kiviõli (1.5 t).

Table 5. Air pollution indicators at monitoring stations in Tallinn, Kohtla-Järve and Narva in 1992 (mg/m³)

Pollutant	Tallinn		Kohtla-Järve		Narva	
	max	average	max	average	max	average
Dust	0.2-0.7	0.1	0.1-1.1	0.0	0.5-0.8	0.1
Sulphur dioxide	0.26-0.93	0.003-0.004	0.078-0.171	0.009-0.011	0.15	0.002
Nitrogen dioxide	0.04-0.17	0.01	0.09-0.38	0.01-0.02	0.11-0.41	0.002
Nitrogen oxide	0.05-0.12	0.01	0.30	0.04	0.20	0.2
Hydrogen sulphide (H ₂ S)	0.010	0.001	0.010-0.018	0.001	...	...
Phenol	0.009	0.002	0.010-0.029	0.001	...	...
Hydrogen fluoride (HF)	0.012-0.025	0.003	...	...	...	...
Ammonia	0.16-0.24	0.03-0.04	0.76-0.93	0.03	...	...
Formaldehyde	0.046-0.064	0.008-0.010	0.029-0.076	0.003-0.005	0.038	0.007

Table 6. Air pollutant emissions from stationary sources in 1992 (tons)

Country, town	Total		Solid particles		NO		SO		CO		VOC		Other	
	quantity	% 1991 =100	quantity	% 1991 =100	quantity	% 1991 =100	quantity	% 1991 =100	quantity	% 1991 =100	quantity	% 1991 =100	quantity	% 1991 =100
Total ¹⁾	479267	79	240777	87	14934	71	179217	77	32460	57	11177	68	682	29
Harju	9443	58	2009	87	344	53	8922	53	3013	55	148	34	7	6
Hiiu	829	52	179	53	38	87	447	60	165	35	-	-	0	10
Ida-Viru	120128	89	46067	90	5113	83	60205	90	7187	96	1549	56	7	87
Jõgeva	3726	72	979	75	93	85	1232	64	1422	75	-	-	-	-
Järva	4253	38	725	18	109	56	1573	41	1846	58	-	-	-	-
Lääne	3451	65	683	80	93	36	1126	54	1549	70	0	-	0	-
Lääne-Viru	94242	85	87234	88	675	56	4593	58	1728	65	11	9	1	13
Pärnu	4043	64	1344	96	180	41	1232	48	1271	70	3	4	13	54
Rapla	3969	63	692	75	146	42	1600	56	1526	71	4	10	1	2
Saare	422	14	35	4	29	15	206	35	142	10	-	-	10	167
Valga	2227	40	208	27	59	11	1057	45	903	50	-	-	-	-
Viljandi	5393	75	769	81	121	64	2397	80	2004	67	83	492	16	114
Võru	3692	65	710	43	92	56	1267	72	1623	77	-	-	-	-
Tallinn	17863	54	1882	45	1388	61	10297	57	3279	52	920	46	97	27
K-Järve	22200	76	4681	75	586	104	8641	72	1334	53	6641	88	317	84
Narva	171860	89	91053	94	5144	82	75211	83	271	71	159	81	22	92
Pärnu city	4489	81	804	128	193	86	1429	55	1947	106	105	47	11	134
Sillamäe	7040	94	723	141	551	101	2782	119	1250	104	1554	58	180	13

1) Excluding the city and country of Tartu and country of Põlva.

Table 7. Emissions of the air pollutants of the 1st and 2nd class of hazardousness in 1992

Country, town	1st class of hazardousness			2nd class of hazardousness		
	quantity t	share, %	%, 1991=100	quantity t	share %	%, 1991=100
Total	22.8	100.0	46	18363	100.0	69
Harju	-	-	-	361	2.0	46
Hiiu	-	-	-	38	0.2	87
Ida-Viru	-	-	-	5195	28.3	81
Jõgeva	-	-	-	94	0.5	85
Järva	-	-	-	109	0.6	56
Lääne	-	-	-	93	0.5	56
Lääne-Viru	1.9	8.3	-	684	3.7	55
Pärnu	-	-	-	181	1.0	35
Rapla	-	-	-	150	0.8	36
Saare	-	-	-	28	0.2	15
Valga	-	-	-	59	0.3	16
Viljandi	-	-	-	119	0.6	70
Võru	-	-	-	91	0.5	56
Tallinn	20.8	91.3	42	1444	7.9	54
Kohtla-Järve	-	-	-	2605	12.6	91
Narva	0.1	0.4	60	5167	28.1	82
Pärnu city	-	-	-	130	0.7	56
Sillamäe	-	-	-	2115	11.5	65

The emission of CFC compounds was 3.5 t in 1992 (1991 - 7.0 t), including 3.26 t of freons (1991 - 1.43) and 0.25 t of tetracarbon-chloride (1991 - 5.6 t). As you know, the use of the CFCs has to be terminated altogether, since they cause the decomposition of the earth's stratospheric ozone layer, which is shielding environment from the hazardous effect of the ultraviolet rays of the sun.

Emissions of air pollutants decreased by 21% in 1992 as compared with 1991. It was probably caused both by the decline in manufacturing and measures introduced in enterprises in 1992 for reducing air pollution.

The emissions of some pollutants, like nitrogen oxide, sulphur dioxide, hydrogen sulphide, formaldehyde, and some other specific substances exceeded the normative concentrations also in 1992, though less than in 1991. In Kohtla-Järve, for example, the emission of hydrogen sulphide, phenol and formaldehyde exceeded the maximum permissible concentration up to ten times in some cases in 1991, but in 1992 only four times. The same falling tendency can be noticed also in other towns.

Indicators of air pollution in Tallinn, Kohtla-Järve and Narva monitoring stations in 1992 are given in Table 5, emissions of pollutants in Tables 6 and 7.

Pollution load of wastes

Estonia produces about 13 million tons of production wastes.

There are no treatment plants and storing place for production wastes, some of the production wastes are taken to dumps. Due to the large amount of wastes the pollution of nature grows. It also reflects the wasteful attitude toward the use of natural resources as a raw material.

Radioactive pollution

Radioactivity in air is measured in 10, the level of radioactivity in 16 monitoring stations. Measurement results are produced in Table 8.

One may draw a conclusion that the radioactivity in air corresponded to the natural level.

Table 8. Radioactivity in the air in June 1993

	Radioactivity β - radiation Bq/m ² 24 h		Radiation level γ - radiation μ R/h	
	monthly average	monthly max	monthly average	monthly max
Tallinn	2.1	6.3	13	13
Kohtla-Järve	2.2	13.7	15	16
Tartu	2.3	6.9	11	12
Pärnu	0.9	5.5	10	12
Paldiski	1.2	3.9	8	9

Spoiling and recultivation of soil in 1992

As it appears from Table 9, the largest area of land was spoiled by mining for mineral resources (97.4% of the total spoiled land, including 55.8% by oil shale mining and 30.7% by peat production). 62.4% of the land spoiled within a year were recultivated in the same year. The total area of spoiled land increased by 19.2% during the year (in 1991 by 0.3%).

As it appears from Table 10, the largest are was spoiled in Ida-Viru county (55.8% of the total land spoiled within a year). Of the land recultivated during 1992 61 hectares were taken into use as agricultural land, 162.4 hectares as woodland, 95.1 hectares as so-called built up land. 8.8 hectares turned into dry open land with vegetation.

Table 9. Spoiling and recultivation of land by spoiling sources in 1992 (hectares)

Source of spoiling	Spoiled		Recultivated		Spoiled land at the end of year	
	area	%, 1991=100	area	%, 1991=100	area	share %
Total	524.8	105.1	327.3	77.1	30665.4	100.0
Mining for mineral resources	511.1	109.0	207.9	53.6	27369.9	89.2
among this						
oil shale	293.0	100.7	150.0	72.5	2609.0	8.5
phosphorite	-	-	-	-	59.0	0.2
limestone						
dolomite	9.1	24.9	-	-	1724.3	5.6
clay	2.0	-	-	-	187.9	0.6
gravel sand						
sand	46.0	65.1	57.9	73.5	3116.6	10.2
peat	161.0	230.0	-	-	19664.1	64.1
other mineral resources	-	-	-	-	9.0	0.0
Mining for soil	4.5	90.0	17.5	291.7	720.9	2.4
Formation of deposits	4.7	32.2	-	-	2192.9	7.2
Rooted up ground	4.5	39.1	101.9	482.9	317.2	1.0
Other spoiling	-	-	-	-	64.5	0.2

Table 10. Spoiling and recultivation of land in counties in 1992 (hectares)

County	Spoiled		Recultivated		Spoiled land at the end of year	
	area	%, 1991=100	area	%, 1991=100	area	share %
Total	524.8	105.1	327.3	76.4	30665.4	100.0
Harju	5.0	12.2	-	-	3617.0	11.8
Hiiu	3.6	85.7	-	-	309.7	1.0
Ida-Viru	293.0	100.7	150.0	72.5	8125.0	26.5
Jõgeva	-	-	-	-	853.0	2.8
Järva	-	-	-	-	2494.0	8.1
Lääne	-	-	0.3	-	912.5	2.9
Lääne-Viru	11.6	-	-	-	1898.2	6.2
Põlva	6.5	-	18.9	-	875.3	2.8
Pärnu	161.0	26 times	-	-	4441.0	14.5
Rapla	-	-	-	-	999.7	3.3
Saare	16.1	7 times	31.8	489.2	1239.3	4.0
Tartu	13.7	274.0	2.8	23.3	1617.9	5.3
Valga	4.0	18.8	8.0	64.5	583.3	1.9
Viljandi	6.0	150.0	18.0	163.6	1099.0	3.6
Võru	1.2	7.1	11.5	191.7	1011.7	3.3
Tallinn	3.0	60.0	86.0	-	555.0	1.8
Narva	0.1	50.0	-	-	33.8	0.2

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