International Center for Economic Growth
European Center

The Expected Effects of the EU Accession on the Chemical Industry in the Czech Republic

By: MAGDA OLYŠAROVÁ AND TOMÁŠ SEDLÁČEK

May 2003

Budapest

Table of Contents

Introduction

Historically speaking, the Czech Republic is one of advanced industrial economies. During the communist regime the emphasis was put on heavy industry: coal mining, steel, heavy machinery and bulk chemicals. During the period of economic transformation and privatisation, Czech industry has undergone restructuring and extensive changes in ownership relations.

In 1990 the Czech economy opened up to the market environment. The volume of production which was uncompetitive and, in the given circumstances, even superfluous rapidly declined. Industrial products experienced a cutback in demand and, as a consequence, the volume of industrial production also declined.

In 1995 the Czech Republic and the European Union entered into the Europe Accession Agreement. This Agreement has established comparable conditions in the area of customs and other non-tariff trade barriers.

The privatisation of Czech industry has fundamentally altered ownership relations. Limited financial resources did not allow most enterprises to carry out the necessary restructuring process. In addition the method of privatisation made it possible for speculative capital to enter the process of asset transfer. The shaping of ownership relations ought to be brought to a conclusion so that owners became interested in the long-term prosperity of their businesses.

The chemical in aggregation with pharmaceutical industry takes a prominent position among the manufacturing sectors. (In the 2001 the sector ranked sixth in revenues from the sale of its own products and services (6.2 per cent share), also sixth in the volume of created value added (6.4 per cent share), but 13th in the number of employed persons (3 per cent share)).

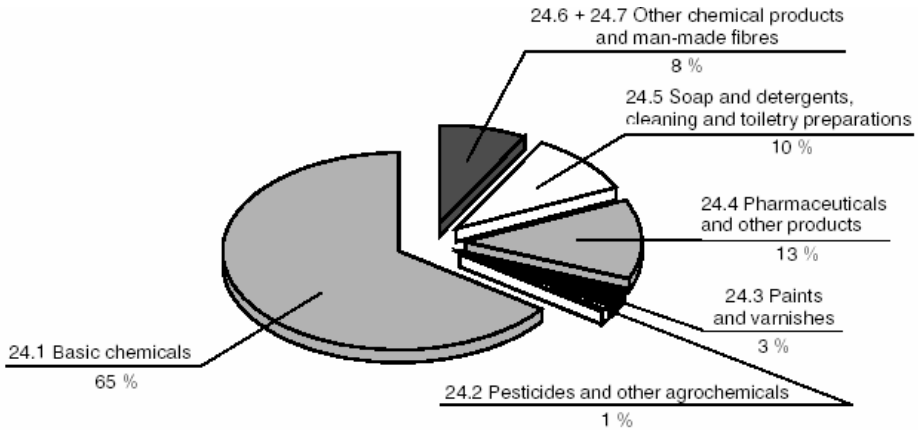
Chemical industry belongs to sectors, which require considerable investment, science, and research. Due to its character, over 85 per cent of world production is concentrated in Western Europe, the USA, and Japan, but this share is steadily declining in favour of the developing world, especially Asia.

In accordance with the Sector Classification of Economic Activities and the Standard Classification of Production (SCP), which correspond to the NACE Rev.1 classification, the sector is divided into seven branches:

- 24.1 Manufacture of basic chemicals
- 24.2 Manufacture of pesticides and other agrochemical products
- 24.3 Manufacture of paints and varnishes
- 24.4 Manufacture of pharmaceuticals and other products
- 24.5 Manufacture of soap and detergents and cleaning and toiletry preparations
- 24.6 Manufacture of other chemical products
- 24.7 Manufacture of man-made fibers

The above list shows that range of products in the seven branches is extensive -include from semi-products to final products, with more than one third of production representing inputs for chemical industry itself (mostly basic chemicals).

The shares of individual chemical industry groups in total receipts for sale of own products and services.



Source: MIT[1]

The weak aspect of the branch is prevalence of bulk chemicals in the production structure, mainly inorganic and petroleum products, and opposite to EU countries Chemical production in CR has a lower share of light-weight products and specialties with higher share of value added. Rigorous restructuring, modernization and specialization of the production base can only improve this situation. Necessary measures started to be adopted at the beginning of nineties (e.g. Unipetrol ambitious development program in the area of refinery manufacture of petroleum and petroleum products) and this trend is continuing.

[1] Data in current prices.

Effect on economic growth

The position of CR chemical industry in comparison with EU is not large (Czech turnover represents ca 0.7 % of turnover in EU), nevertheless integration into the EU market is active and EU is very most important business partner of the Czech Republic. The main effect of the accession to EU is already taking place and no dramatic change connected with the EU accession is expected. (Access to trade growth, economies of scale and new markets could slightly improve position of the Czech chemistry; on the other hand, severe competition can be seen in this region.)

CR has relatively slower dynamics of growth (The EU raised its output of chemicals and pharmaceuticals 23% over 1995 to 2000, while the CR 16% only. The difference is even bigger when dynamics of last years is considered: the EU raised the output about 11% and the CR decreased it about 2% over 1998 to 2001.)

Large EU related investments in the environment sector in the mid 1990s have already produced notable results and more restructuring took place recently. However the effect of foreign direct investment is not as distinct in the sector as, for example, in the rubber and plastics industry or the manufacture of motor vehicles, computers, etc., it is expected to see the growth effect of these in the near future. (Overall investment sales ration is high and comparable with the EU).

To forecast the growth after EU accession is very difficult because environment is highly turbulent. It will depend on a broad range of factors. Chemical production is close related to the development of world price of petroleum, which is nearly impossible to estimate (diffusion of estimations is very high, from 20 to 35 USD per barrel). Future development depends on CZK exchange rate to USD as well and on the stability of the world political situation, so that no shocks, such as terrorist attack on 11 September 2001, will repeat. The possibility of war with Iraq, however, casts further uncertainty.

CR should reflect world trends in this sector and adjust to them. Trends in chemistry can be seen as follows:

- Market orientation on client/customer-higher requirements on quality of products and services, made to order products.
- More strict ecological standards (classification, packaging, waste, recycling, substitutes for inputs, that are not in accordance with standards, investment in productions).
- Globalization of world market.
- Unification within the integration in Europe.
- New progressive developing markets in Southeast Asia (FDI flow from Europe-more interesting than Central and West Europe markets).
- Concentration of production (especially basic chemicals).
- Need for capital

- Importance of R&D, innovation.
- Potential growth in qualified chemistry-the most progressive chemical branch in Europe, higher value added, materials on natural base, competitiveness depends especially on high quality of products and services.

Putting of these targets into reality will however hinge on focusing, in particular, on the following main targets:

- Reinforcing of the process of concentrations, strategic alliances and partnerships, mergers and acquisitions with active participation of domestic and foreign capital,
- Consequent restructuring, modernizations and specialization of the production with focus on higher degree of finality of products and growth of share of higher value-added products
- Finalizing the process of harmonization of Czech and EU legislations, which enable Czech entrepreneurs an easier access to EU markets
- Consistent introduction and application of the strategy Responsible Care, principles of environmental management EMS and EMAS, IPPC, BAT (Best Available Techniques) etc. in chemical enterprises
- Increasing the qualification level of the workforce in chemical enterprises in the sphere of research and development, management, marketing, financing, trade, information technologies, legislative and language skills.

Growth potential seems to be in the areas:

- Specialization on Plastics, Pesticides, organic products and organic semi-finished goods, light-weight products and specialities with higher share of value added)

Growth decline is expected in

- Basic chemicals, (increase in import from cheaper destinations, capital intensive, low value added)

Areas where competition from Asia, cheap labor destinations can be expected

Labor market effect of EU accession

State of the Czech labor market

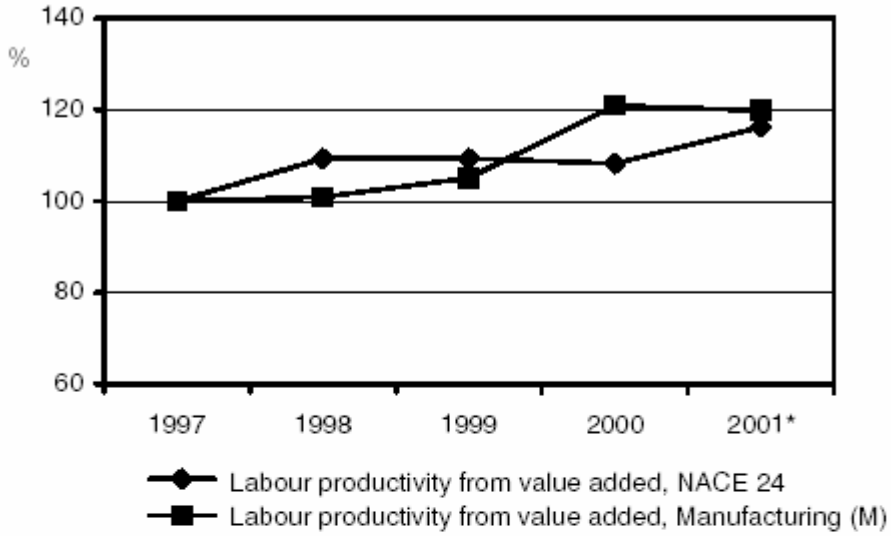
The workforce in the Czech chemical industry is well educated, there is also potential in science and research (as a source of innovation) and low personal costs (an comparison with the EU data shows that the personnel costs to value added ratio in Czech chemical industry is favorable-about 56% in the EU, 36% in the CR in2001).

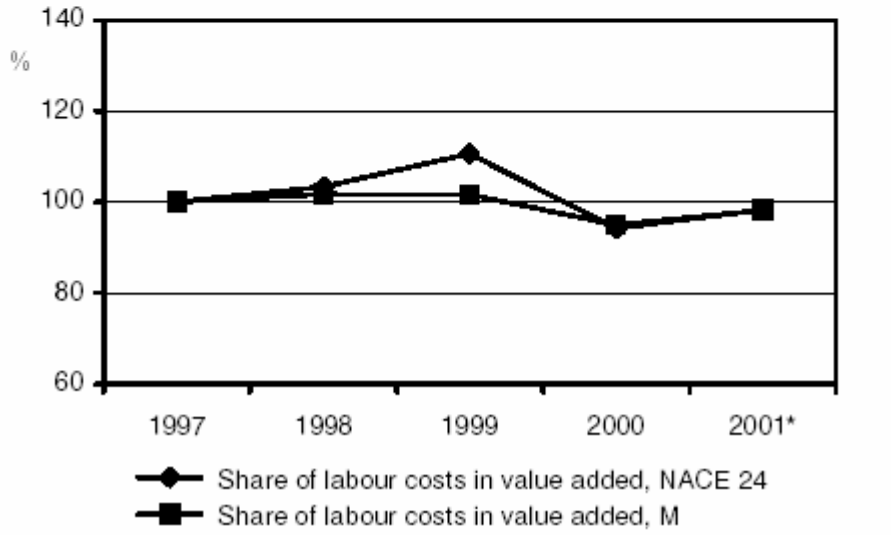
Table 3.1 Labour costs in 1997 - 2001

(Mill. CZK)	1997	1998	1999	2000	2001*
Basic chemicals	5951.5	6302.9	6615.3	6430.9	6592.3
Pesticides and other agrochemical products	75.9	125.8	144.6	173.6	180.5
Paints and varnishes	490.2	491.2	514.6	543.3	614.1
Pharmaceuticals and other products	1551.9	1647.4	1856.9	2085.0	2235.6
Soap and detergents and cleaning and toiletry preparations	873.1	921.2	957.0	948.0	992.9
Other chemical products and man-made fibers	1225.4	1290.5	1340.6	1529.4	1633.4
Chemical industry	10168.0	10779.0	11429.0	11710.2	12248.8

* Preliminary value

Source: MIT





Source: MIT[2]

But on the other hand mobility of workforce is limited (very problematic is the fact, that the real estate market is regulated and so supply of real estates is distorted). Even if workforce is well educated, cooperation between the educational system and the needs of the labour market is insufficient and no integrated system of human resources development exists. There is also still low share of state support of R&D and education, reflecting a low priority this is being accorded in society.

[2] Labor productivity from value added in current prices, personal costs in constant prices of 2000.

Labor productivity

One of the most important problems of competitiveness of the CR chemical industry is *low labor productivity* (value added in 1999 reached only 44 % of the level in Austria and 48.1% of the one in Germany).

Table 3.2 Structure of value added

Aggregation/branch	Value added to turnover ratio, current prices, %		Share of personnel costs %	
	2000	2001	2000	2001
Crude oil processing	11.1	6.0	16.6	35.8
Chemicals & pharmaceuticals	25.7	25.6	35.5	37.6
Basic chemicals	23.0	23.6	34.9	35.7
Pharmaceuticals	42.2	40.2	31.6	33.8
Cosmetics, soap & detergents	18.9	17.5	32.7	36.7
Paints and varnishes	22.8	23.6	54.7	53.6
Chemical fibers	22.0	16.2	49.0	67.3
Other	39.6	41.7	45.9	55.0
Rubber and plastics processing	29.8	27.3	48.5	50.1
Rubber	31.8	25.7	44.6	48.1
Plastics	27.7	28.8	53.1	51.9
Industry of the CR, total	27.8	26.5	47.0	48.4

Source: Association of Chemical Industry of the Czech Republic

As shows table 3.2, value added to turnover ratio decreased in all the aggregations and branches of chemical industry in 2001, most in crude oil processing and rubber industries. Basic chemicals, paints and varnishes, plastics and other chemical manufactures increased this ratio slightly; Personnel costs to value added ratio grew in all the aggregations and branches except for paints and varnishes and for plastics. A similar trend was observed in the Czech industry in total, but the chemical industry maintains a considerably higher personnel costs to value added ratio.

The main sources of current low labor productivity can be seen in following:

- The production structure consists mainly of products with low value added and the share of products with high value added is insufficient.
- Low growth of innovations, given the fact that there is insufficiently developed R&D base.
- Essentially lower kilogram prices of Czech chemical products.
- High energy intensity of the branch.

- Significant environmental burdens from the past, which induce high restructuring and modernization costs.

  After accession to EU labor productivity is expected to rise due to increase in competition and investment.

R&D

At present the main comparative advantages of the Czech chemical industry are good qualification of employees together with low personal costs, relatively developed intermediate-product base and advantageous geographical location. Nevertheless some of these qualities are disappearing.

During the transformation period, the interest in human capital development receded to the background (economic reform was accompanied by a reduction of scientific research base in the Czech chemical industry). All responsibility for the support of human capital development in the production process was fully borne by businesses (a number of research establishments and institutes were dissolved or reduced without any substitution). This has resulted in low efficiency in the use of human resources.

Expenditures on education and training are insufficient, even if in the last four five years the situation started to improve slightly and expenditures for research are gradually increasing.

It is necessary to focus on R&D strengthening, increasing products specialization and on innovations. They would mainly concern innovations in the area of specialized chemical production (paints, consumption chemical products, chemical specialities) and technological innovations in the area of basic chemicals (namely petroleum chemical products, bulk organic and inorganic products).

Table 3.3 R&D, Basic indicators

Sector	R&D employees (average number)		Domestic R&D expenditure, total (CZK thous.)		Wages incl. Other personnel costs as % of total domestic R&D expenditure	
	2000	2001	2000	2001	2000	2001
Manufacturing	120294	110375	10649409	11650884	25	23
Manufacture of chemicals and chemical products	1416	1226	1094142	1012616	29	32

Source: Czech Statistical Office

Migration

First of all it is necessary to mention that no big movements of workforce are expected (most of the changes already took place) and CR will not be fully admitted into Schengen on the day of entry into EU. Four countries (Germany, Austria, Belgium, Finland) declared, that they would protect their market by not adopting Schengen. In contrary they will apply current national regime. However this regime is quite liberal-about 90% applicants

for labour permition succeed (in 2000 it was 94 % in Germany, our main partner in this sphere) and the quote for Czech workers in Germany has not been filled yet.

General trends in the vocational training:

Concerning evolution of labour market after accession to EU, following requirements on workforce can be expected:

- Requirements on qualification level of the workforce in chemical enterprises in the sphere of research and development, management, marketing, financing, trade, logistic, information technologies, legislative and language skills.
- Consistent introduction and application of ISO 9000 and ISO 14 000
- Increasing the importance of complex education of the workforce

Short-term policy recommendations

- Development of vocational training reflecting the requirements of the European labour market and employment requirements
- Implementation of lifetime learning to ensure maximum development of each individual, hand in hand with corresponding changes in the structure, contents, and form of both basic and advanced education
- Optimisation of the network of schools at the regional level
- Integration of scientific, educational, and production capacities to increase innovation R&D in private sector

SWOT ANALYSIS

STRENGTHS	WEAKNESSES
• Skilled and adaptable workforce • Relatively high level of education of the workforce (in particular secondary education) • Existing human potential in science and research as a source of innovation	• Limited geographic mobility of the workforce • Low labour productivity • Insufficient links between the educational system and the needs of the labour market, low participation of employers and trade unions in the programme, organisation and funding of vocational training • Absence of an integrated system of human resources development • Low share of state aid to industrial research and development in comparison advanced economies • Insufficient number of young professionals • Low participation of universities in research activities related to the business needs • Need of young professionals in chemical industry (high share of employees over fifty).
OPPORTUNITIES	**THREATS**
• Skilled and adaptable workforce • Development of vocational training reflecting the requirements of the European labour market and employment requirements • Implementation of lifetime learning, hand in hand with corresponding changes in the structure, contents, and form of both basic and advanced education • Optimisation of the network of schools at the regional level • Integration of scientific, educational, and production capacities to increase innovation	• Absence of a human resources development system and of lifetime education and training and care of the human capital • Isolation and insufficient co-ordination of the processes involved in the modernisation of the education system, and limited participation of social partners and other players • Low share of GDP channelled to expenditures on education, reflecting a low priority this is being accorded in society • Persistent lagging behind the developed countries in the sphere of support rendered to science and technology

The effect of accession on FDI flows

The state of investment in CR

As mentioned in Chapter 2, the influence of foreign direct investments (FDI) in DG branch is not as significant as in other branches, e.g. manufacture of rubber and plastic products, Manufacture of motor vehicles or IT etc. The most of crucial investments realized by companies of Unipetrol (e.g. expansion of the ethylene, polyethylene and polypropylene capacities in Chemopetrol a.s., production of nitric acid in Lovochemie a.s., etc.), has been financed from domestic sources (bank credits), meanwhile the foreign capital has financed incentives of Eastman Sokolov, a.s., respectively BorsodChem - MCHZ, s.r.o., and some other projects, which are at the stadium of plans.

Investments in the chemical industry

Table 4.1 Investments in the chemical industry and their structure

	Tangible investments			Intangible	Imports
	Total	Construction	Machinery & equipment		
CZK mil.	21 863	7 169	14 026	668	6 956
Index 01/00, %	100.0	100.0	106.8	66.5	86.0

Source: Association of Chemical Industry of the Czech Republic

The 2001 ratio of tangible investments to sales was 4.6 % (crude oil processing) and 9.2% (chemicals and pharmaceuticals). The highest dynamics of development was recorded for the aggregation of rubber and plastics, where the ratio was 11.4%. The ratio of investments to sales in the aggregation of chemicals and pharmaceuticals is in good agreement with the EU average, which stood at 5.6% in 2000. The highest ratio was recorded for Austria (13.7%), while it stood at 6.6% in Germany. As for the CEFTA countries, it was in Poland (8.6%) and in Hungary (11.1%).

What CR offers

Advantages

- More than hundred years tradition
- Infrastructure
- Broad range of chemical products
- Quality of fundamental products comparable with foreign production (but just few in high quality)
- Highly skilled workforce

- Highly qualified chemical specialists
- Low personal costs
- Technical standards harmonized with EU legislative
- State participation on ecological investment

Disadvantages:

- Small market
- Import of inputs and raw materials
- Low labor productivity
- Low value added
- Old technologies
- Low production capacity
- Environmental burden
- Export focus just on few markets
- Loss of markets in post SU countries

Potential sources of FDI:

Most of investments already taking place, except of the privatization of Unipetrol, there is not expected any important FDI flow. More attractive areas for multinational companies of the World and European chemical industry are regions in Asia and South America, with lower production costs and more liberal environmental legal rules are some possibilities of FDIs from Western and Central Europe.

Nevertheless, the Czech chemical industry is undercapitalized, reinforcing of the process of concentrations, strategic alliances and partnerships is necessary to realize the restructuring, modernizations and specialization of the production with focus on higher degree of quality of products and growth of share of higher value-added products. Czech chemical producers and administrative bodies should focus on medium and smaller foreign companies to invest mostly in manufacturing of light-weight specialized chemical products. Positive effect on FDI could have the fact, that there will be easier movement of capital and access on the Czech market after accession to EU. This could increase confidence of investors and result in moderate growth of FDI and**.**

SWOT ANALYSIS

Strengths	Weaknesses
More than hundred years tradition	Small market
Infrastructure	Import of inputs and raw materials
Broad range of chemical products	Low labor productivity
Quality of fundamental products comparable with foreign production (but just few in high quality)	Low value added
Highly skilled workforce	Old technologies
Highly qualified chemical specialists	Low production capacity
Low personal costs	Environmental burden
Technical standards harmonized with EU legislative	Export focus just on few markets
State participation on ecological investment	Loss of markets in post SU countries
Opportunities	**Threats**
Direct foreign investments (DFIs) are an important source of capital, technologies and export opportunities for Czech companies	negative impact of the existing business environment on investors
DFIs exert a strong influence on regional industrial development	regional shortages of adequately skilled workforce
an investment incentive system makes the business environment in the country more attractive to both local and foreign investors	own capital in short supply
	sluggish restructuring of the traditional heavy industry sectors

The effect of accession on foreign trade and evolution of net exports

Czech foreign trade in chemical products is an area in which the Czech chemical industry is clearly confronted with world development. In 1995 the Czech Republic and the European Union entered into the Europe Accession Agreement establishing the free trade area between CR and EU and so liberated fully trade with industrial products. EU countries became the main business partners of CR.

After EU accession CR will take a part in common commercial policy. This fact can have following consequences:

CR access to all EU treaties, that create customs unions, free trade areas and preferential tariffs regimes with third countries. This will result not only in easier access of Czech products on the markets of those countries but also higher degree of competition from their part on the Czech domestic market and so import of cheap chemical products (especially those with low value added) from Asia, South America and others is expected.

Access to common customs tariff, EU common customs tariff differ just slightly from current Czech customs tariff and it applies just to several non-European countries (US, Canada, Australia, New Zealand, Japan etc) so any substantial change in flow and structure of the export of chemical products is expected.

CR will access to many commercial treaties between EU and other countries. Good knowledge of such commercial and political regime will be necessary for running business in EU business environment. So there could arise some problems for SMEs, because their capital and human resources are more restricted.

CR will no longer be the object to EU anti-dumping policy, in the contrary CR will participate on it.

Deficit in Czech foreign trade in chemical products

The long-standing problem of the Czech chemical industry is *growing deficit* of foreign trade in chemical products. In 2001 the deficit rose by over 9.1 billion CZK, to 66.4 billion CZK as compared to the previous year, and most of this increase (+7.4 billion CZK) originated in the trade exchanges with the European Union. Concerning chemical industry, The Czech Republic has been in deficit with practically all the EU member states. (Comparative disadvantage of the Czech chemical industry is a dependence on import of petroleum and other inputs).

Table 5.1: Balance of trade in chemical products

	1996	1997	1998	1999	2000	2001
Deficit in Czech trade						
in chemical products (SITC 5)						
in billion CZK	-34.8	-41.9	-47.1	-52.9	-59.5	-69.5
% of the total deficit in Czech balance of trade	23	28	59	82	49	58

Source: MIT

The main problem – a rising deficit – is caused by high dependence on imports of inputs, low production of the Czech chemical industry and export of chemical products. The share of these products in total Czech exports has been in long-term decline – from 9.3 per cent in 1995 to 6.4 per cent in 2001, and the share of chemical products in total imports dropped from 11.8 in 1995 to 10.9 per cent in 2001.

The conditions of exports are difficult, and this dictates the need for an adequate and effective scientific-technological base. Nowadays a dominant share in sales in chemicals is produced by enterprises engaged in *basic chemicals* – in the area where improving competitiveness through large innovations is very capital spending. The enterprises account for almost 70% of constant price sales in the whole aggregation. Changes in the structure in favour of branches with a higher share of value added, such as manufacture of specialities, are relatively slow. Moreover, products of basic chemistry, primarily petrochemicals, are very sensitive to price movements of the basic petrochemical raw material – *crude oil* – in world markets and to fluctuations in exchange rate. For instance, in 2001 the appreciating exchange rate of Czech currency lowered achieved export prices, but there was no adequate lowering response as to prices of input materials when USD/CZK exchange rate was stagnating. The internal structure of the chemicals and pharmaceuticals aggregation differs a lot from the structure in EU and other industrially economies (Japan, U.S.A, etc.).

In the specific conditions of the small open economy it is necessary to specialize on the core perspective business. Optimum and dynamic orientation of the Czech production and foreign trade in this field is a key problem of the best possible restructuring of Czech industry in its entirety.

Foreign Trade Relations

The territorial structure of Czech trade in chemical products is stabilized no substantial changes are expected. Development of foreign trade with chemical products clearly shows the dominant role of the EU countries, and this applies to both imports and exports. This fact is determined by a combination of many factors, including the proximity of partner countries, good knowledge of markets and their requirements, capital involvement, concentration of production and sale, and the strengthening position on the consumer market (paints, medicinal and pharmaceutical products, perfumery, chemical products for households, etc.). The stable and fairly important surplus in trade with the European transiting economies and the Commonwealth of Independent States partially reduces the deficit in trade with countries having an advanced market economy. But the intensity of this reduction is weakening (in the late 1980s the surplus in trade in chemical products with the former socialist states fully covered the deficit in this trade with the rest of the world).

The foreign trade relations with the Czech Republic partners in trade in chemical products in order of importance is figured on Table 5.2.

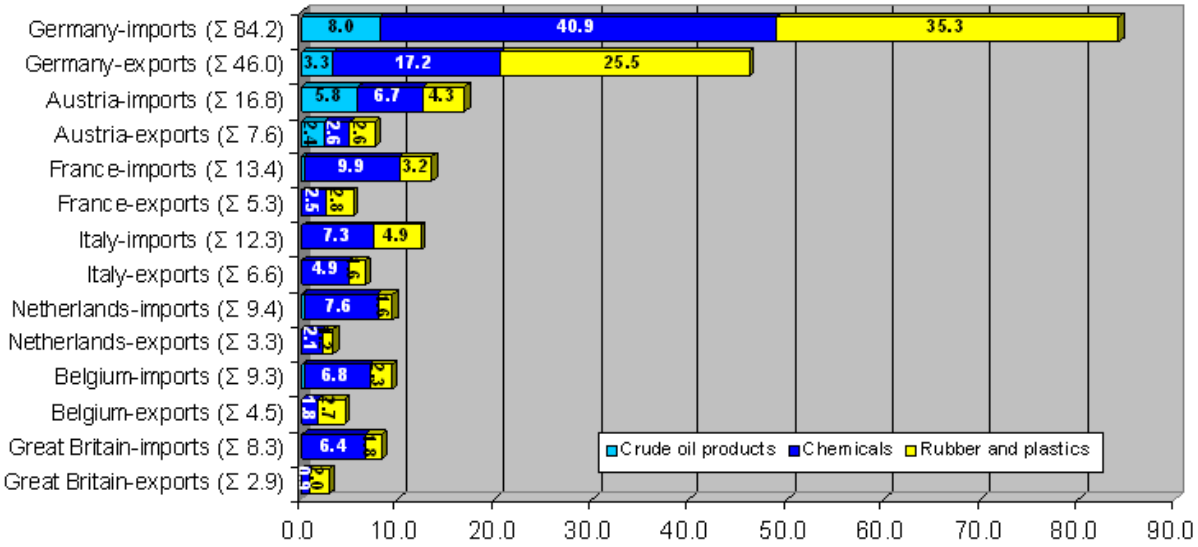
Table 5.2: Main partners of the Czech Republic in trade in chemical products

Country	2000			2001		
	exports	imports	balance	exports	imports	balance
	in billion CZK					
Germany	20.4	46.6	-26.2	20.0	49.7	-29.7
France	2.8	9.4	-6.6	2.2	10.7	-8.5
Britain	1.1	6.3	-5.2	1.1	6.6	-5.5
Netherlands	2.3	6.5	-4.2	2.1	7.5	-5.4

Switzerland	1.5	4.9	-3.4	1.2	6.5	-5.3
Belgium	1.7	6.7	-5.0	2.3	7.2	-4.9
Austria	2.8	7.2	-4.4	2.9	7.7	-4.8
USA	3.0	6.3	-3.3	2.5	6.8	-4.3
Italy	4.2	7.6	-3.4	4.3	8.0	-3.7

Source: MIT

Territorial structure of imports and exports of chemical products: trade with EU countries in 2001, CZK in billions



Source: Association of Chemical Industry of the Czech Republic

The development of foreign trade is under the dominant influence of relations with countries of the European Union. The main focus on trade with Germany, and its decisive influence on the deficit in the trade in chemical products can be seen on Table 4.2. Czech trade in chemical products has a high deficit no matter whether the West European partners are large or small. In the new conditions of economic development, the Czech market attracts these countries. This does not apply only to Germany, but also to other West European countries, as proved, for example, by their share in the total Czech imports of chemical products: France 7 per cent, Italy over 5 per cent, and the other EU countries (Austria, the Netherlands, Belgium and Britain) and partners with advanced market economies (USA and Switzerland) all between 4 and 5 per cent. Predominant imports are also typical of trade with developing countries, and other countries with economies in transition or state economies. So the Czech Republic has a surplus only in trade with European economies in transition and the Commonwealth of Independent States.

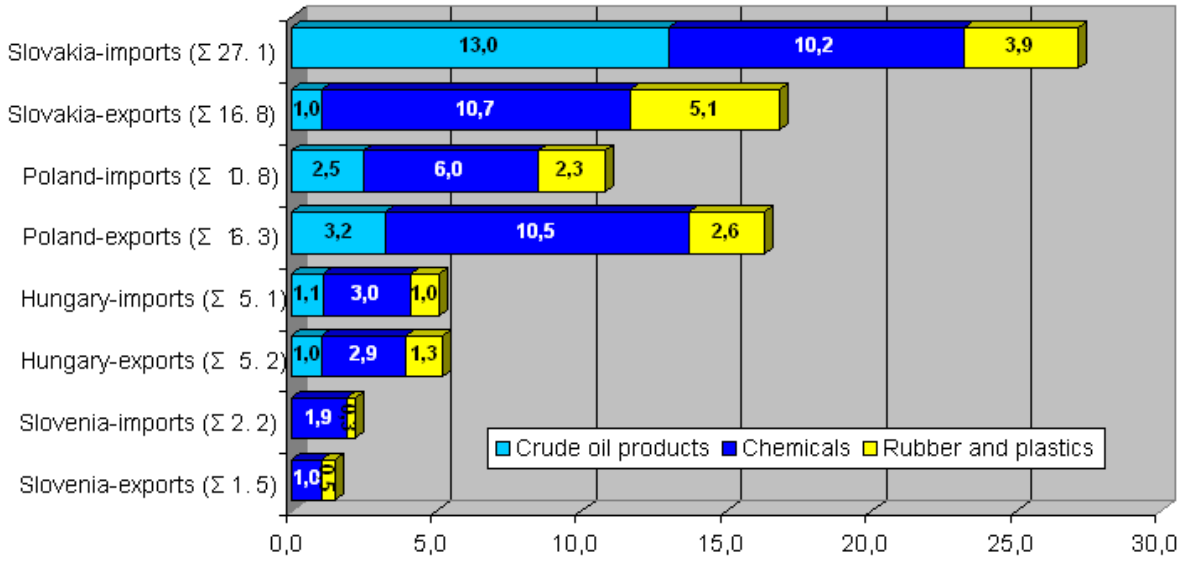
Table 5.3: Territorial structure of Czech trade in chemical products

Developed Market Economies	1998	1999	2000	2001
	in billion CZK			
– exports	33.5	35.1	43.7	42.7
– imports	89.9	97.3	112.0	121.5
– balance	-56.4	-62.2	-68.3	-78.8
of which				
– EU Countries				
– exports	30.0	31.0	37.7	37.4
– imports	79.0	84.9	98.5	106.7
– balance	-49.0	-53.9	-60.8	-69.3
Developing Countries				
– exports	1.6	1.6	1.9	1.7
– imports	1.1	1.6	2.3	3.0
– balance	0.5	0.0	-0.4	-1.3
European Transitional Economies and CIS				
– exports	30.7	30.0	33.5	37.0
– imports	19.8	19.8	23.3	25.2
– balance	10.9	10.2	10.2	11.8
Other Countries with Transitional and State Economies				
– exports	0.2	0.2	0.4	0.2
– imports	1.3	1.1	1.5	1.4
– balance	-1.1	-0.9	-1.1	-1.2

Source: MIT

But data in Table 4.3 testifies to a low rate, and the surplus in the trade in chemical products tended to stagnate. Nevertheless, this surplus is by no means negligible, especially in trade with the CEFTA countries: the 2001 considerable surplus was CZK 4.0 billion with Poland, and moderate surplus CZK 2.3 billion with Slovakia. There was also a 2001surplus of CZK 0.8 billion in trade with Russia, and CZK 1.2 billion in trade with China.

Territorial structure of imports and exports of chemical products: trade with CEFTA countries in 2001, CZK in billions



Source: Association of Chemical Industry of the Czech Republic

SWOT ANALYSIS

Strengths	Weaknesses
Proximity of important European markets	Import of inputs and raw materials
Quality of fundamental products comparable with foreign production (but just few in high quality)	Dependence on petrol imports
Share of companies with foreign participation in exports	Low labor productivity
Technical standards harmonized with EU legislative	Low value added
	Old technologies
	Low production capacity
	Environmental burden
	Export focus just on few markets
	Loss of markets in post SU countries
	Insufficient experience in foreign trade and insufficient knowledge of markets, mainly on the part of the SMEs
	Lack of marketing information and a low level of marketing activities abroad
Opportunities	**Threats**
Increase of export through specialisation.	Growing competition in the world markets
Better image of Czech producers.	Open market to imports from Asia and South America countries with cheaper production
Easier access on foreign markets	An insufficiently market oriented approach by the entrepreneurial sector
Higher involvement of Czech enterprisers in the global economy and better utilization of trade opportunities	Failure to cope with the high requirements and costs associated with the operations of the businesses within the EU single internal market
• Improvement of the competitiveness of Czech producers on the world markets (relates to the first line in Threats)	

The effect of accession on the market structures

Existing ownership structure

In 1992 there was 76 state companies in the chemical industry sector with property in amount of about 70 billion CZK. Privatization of the state property shares in Czech chemical industry was carried by coupon privatization, public tender, direct sale or free transfer of property.

The rest of property, in possession of the National Property Fund has been sold or the state possesses it in the form of strategic shares.

In the process of privatization the majority of companies was split into smaller entities before they were sold. The new companies remained sufficiently powerful and also commercial relations between them were mostly unaffected.

Important role in transformation took foreign investments. The most important FDI into the Czech chemical industry was the creation of joint venture with the multinational companies AgipPetroli, Conoco and Shell and Česká Rafinérská (IOC consorcium gained a 49% share in Česká Rafinérská).

The current trends in the CR confirm general world tendencies in chemical industry:

- Concentration (benefit from returns to scale) chemical industry is being controlled by closed number of great multinational companies producing broad range of products through highly specialized subsidiaries-this trend can be seen also in the CR, since 1999 the sector of chemical industry has been assessed by The CR Office for The Protection of Competition as sector with strong tendency towards concentrations of undertakings.

- Concentration of production in main industrial regions. Crucial chemical companies are concentrated in the regions with the longest tradition of the chemical industry, i.e. Ústí nad Labem region (Chemopetrol, a. s., Spolchemie, a .s.), Central Bohemia region (Spolana, a. s., Kaučuk, a. s.), Capital of Prague (e.g. Linde Technoplyn, a. s., Léčiva, a. s. and others) and Pardubice region (Aliachem, a. s. - o.z. Synthesia).

- Increase of vertical concentration

- Importance of R&D and engineering

Key chemical companies in CR

Chemopetrol, a.s. Litvínov

Chemopetrol, a.s. is the biggest Czech chemical company and a key center of petrochemical production with connections to several chemical productions in the Czech Republic. The company produces ethylene, other pyrolysis products (propylene, C4 and C5 fractions, benzene, oils from pyrolisis), high-density polyethylene, polypropylene, ethyl benzene, ammonia, urea, and others. Petrochemical production has the highest share of the company's revenues, while ethylene, polyethylene and polypropylene have the highest share from the specific high-tonnage production. The building of a new modern unit for the production of polypropylene, the intensification of high-density polyethylene and the extension of the ethylene unit are currently almost at their end. The production of high-density polyethylene already begun at the end of May in 2002, while the starting-up of the other production units is expected gradually in the following months.

Kaučuk, a.s. Kralupy

The production programme of this company consists of styrene-butadiene rubber, styrene, polystyrene, butadiene, and other materials. Plastics and styrene-butadiene rubber have the highest share on sales, together more than 70 per cent. Almost three fifths of the company's production is exported. Two important production units began to operate in 1998: "Styrene III." and "Block crystalline polystyrene". Both these units enabled the company to raise its competitiveness on the domestic and international markets. Last year, the company completed the extension of the capacity in styrene production by 40,000 tones up to 170,000 tons. Currently, a new unit for the production of ethyl benzene with a capacity of 300,000 tones a year is being built. The costs of this unit are at CZK 1.2 billion and the unit should be completed in the Q4 of 2003.

Lovochemie, a.s. Lovosice

Lovochemie a.s. is the biggest domestic producer of industrial fertilizers and especially of nitrogenous fertilizers (ammonium nitre with limestone – LAV and ammonium nitre with magnesium – LAMg), combined fertilizers (NPK) and liquid nitrogenous fertilizers (e.g. DAM 390). Further production includes abrasive materials, carboxymethylcelulose and others. The production of rayon tyre cord belonged to the key productions in the recent past too, but this production was sold on 1 September 1998 to the company Glanzstoff Bohemia, s.r.o., a daughter company of the Austrian company Glanzstoff Austria. The investment into the production of nitric acid with a daily capacity of pure acid production at 900 tones is currently being completed. The costs of the investment exceed CZK one billion and the production should commence at the beginning of the next year.

Spolana, a.s. Neratovice

Spolana Neratovice is the fifth largest Czech chemical company when measured by volume of revenues. It is a monopoly producer of PVC in the Czech Republic, as well as of linear alpha-olefins (about 12 per cent of the world market), caprolactam (raw material for the production of polyamide fibers), and until 1999 also of viscose staple (this production was halted in 1999). The production of chlorine, sodium hydroxide and ammonium sulfate are all important parts of the company's inorganic production. The company depends on the supply of raw materials from Litvínov. About three quarters of its production is exported.

Eastman, a.s. Sokolov

This company is one of the most modern in the Czech chemical industry. Its production programme consists mainly of the production of acrylic acid (the fourth largest European producer), its esters, acrylate dispersions and others. The company exports more than four fifths of its production, of which the majority share is exported to the German market. The Government decided on the privatization of the majority share in this company to the prominent American chemical concern Eastman Chemical in July 1999, and Eastman took over the company in March 2000. Eastman Chemical expects a reduction of the company's production portfolio and the installation of new products that would deepen the subsequent manufacturing of acrylic acid. A growth in the production of acrylic acid and its polymers that create higher valueadded is planned in the future.

BorsodChem-MCHZ s.r.o., Ostrava (BC-MCHZ)

The company was established in May 2000, when the companies Aliachem, a.s. and BorsodChem (Hungary) created the joint venture BC-MCHZ by hiving off the dominant part of Moravské chemické závody. The basic capital of the company is valued at CZK 860 million and BorsodChem owns a 97.5 per cent share in it. The production programme concentrates on the production of anilines, amines, technical gases, inorganic acids, and glues. The company belongs among the six biggest European aniline producers and it is also the largest world producer and seller of cyclohexylamine. Synthetic resin and glues are produced here, too. Aniline is the dominant product of the company with a 50 per cent share of the company's revenues.

DEZA, a.s. Valašské Meziříčí

DEZA produces several products based on distillation of bituminous coal tar, and also individual monoaromates of the benzol group. The company is a monopoly producer of aromatic chemical and technical materials produced from bituminous coal tar and from raw benzol (benzene, anthracin, etc.) in the Czech Republic. It also manufactures oxoalcoholes from petrochemical raw materials. DEZA, a.s., controls a 48 per cent share in the joint venture called CS CABOT, s.r.o. (production of carbom black) with the prominent American CABOT Corporation. A little less than 60 per cent of the company's production is exported, and the main export markets are Germany (21.1 per cent), Poland (11.8 per cent), and Slovakia (8.9 per cent).

Spolchemie, a.s. Ústí nad Labem

Spolchemie is one of the oldest Czech chemical companies and its broad production program includes the production of epoxide and polyester resin (the main consumer of petrochemical products: propylene, xylene, and petroleum spirit). Furthermore, the company produces organic dyes, pigments, organic semi-finished products and basic and special inorganic products, especially on the basis of halogens, and other chemical specialties. Exports in 2001 exceeded CZK 2.1 billion and grew by 2 per cent compared to last year. The biggest part of these exports is oriented to Europe, while some also goes to the USA, Canada or Latin America. An extensive transformation programme is currently underway in the company (gradual reduction of some production - cosmetics, paint materials) with the purpose of orienting on the "core business" (resin, dyes, inorganic chemical etc.). The company plans to enter into several strategic alliances with its foreign partners this year. These partners should cooperate mostly in the area of synthetic resins and especially in epoxide resins.

Aliachem a.s., odštěpný závod Synthesia Pardubice

Synthesia Pardubice is the biggest producer of qualified chemicals in the Czech Republic. It has a large portfolio of products that consists of organic dyes and pigments, organic semi-finished products, industrial fertilizers, agents for the protection of plants, plastics, pharmaceutical substances, explosives, and others. Organic dyes and chemicals, organic chemicals, explosives, inorganic chemicals and plastic materials have the highest share of the company's revenues. Exports have a more than 60 per cent share of the company's total revenues and its products are exported to 50 countries. There are also some petrochemical semi-finished products manufactured by the company, such as ethanol, butanol, benzene, toluene, ammonia, and others.

UNIPETROL

Unipetrol is a group of companies operating in the chemical industries sector in the Czech Republic, primarily in crude oil processing, distribution of fuels, petrochemistry and fertiliser production. In all of these fields, Unipetrol is a major representative of the given industrial sector in the Czech Republic and in Central Europe[3]. The Unipetrol Group includes primarily the following: *Česká rafinérská* (a joint venture with the multinational companies AgipPetroli, Conoco and Shell) and *Paramo*, the largest Czech producers of motor fuels, bitumens, lubricants and other products related to crude oil processing. *Chemopetrol*, *Kaučuk* and *Spolana*, involved mainly in the production of petrochemical products and plastics. *Benzina*, the largest network of petrol stations in the Czech Republic.

The Group has the following affiliated members: *Lovochemie*, an important producer of industrial fertilisers and other inorganic chemicals, *Aliachem* - a group of enterprises involved in organic and inorganic chemistry and the processing of plastics, *C.H.T.*, a trading company with branch offices in Europe, North America and Asia, *Kralupol*, a LPG supplier, and a number of smaller distribution, service and research companies.

Unipetrol shares were among the most liquid titles traded on the Prague Stock Exchange (PSE) in 2001. Traded shares equalled a total of CZK 4,746,664,000, which placed them at sixth place among the most frequently traded titles. In terms of market capitalisation (CZK 8,167.3m as of 31 December 2001) Unipetrol took seventh place among all companies traded on the PSE.

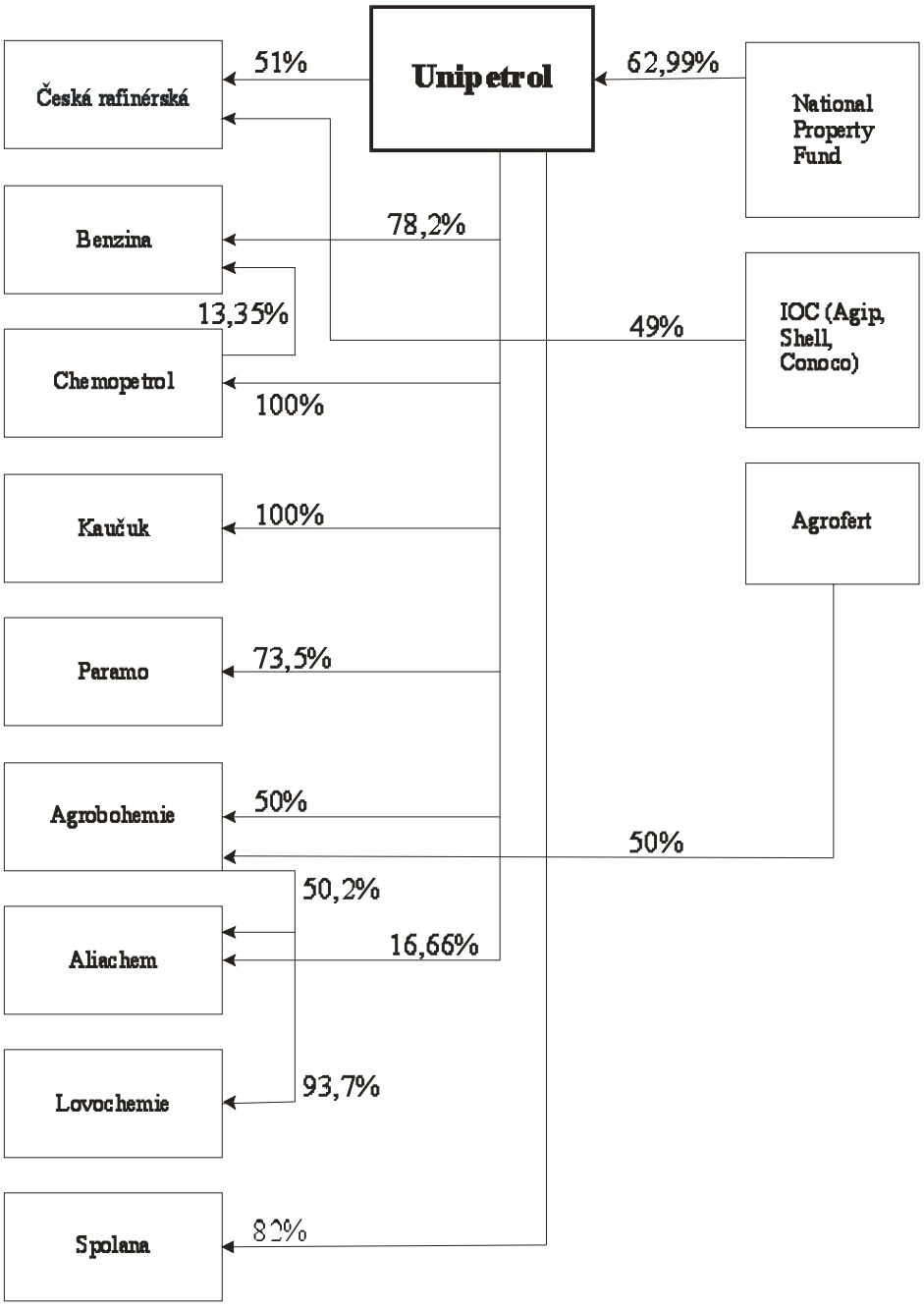
The privatization tender began in the autumn of 2001, but the first tender was canceled because of withdrawal of Agrofert, the tender winner. New tender should be called at the beginning of 2004. The Cabinet declared firstly attempt to sell the holding as is.

In the form of capital shares in subsidiaries concentrates Unipetrol group the most important domestic petrochemical producers and refineries.

---

[3] In 2000 the world turn over of the Unipetrol group was 88.3 billion CZK, where 62.4 billion CZK was achieved in the CR.

Unipetrol`s ownership structure is described bellow:



Source: Unipetrol

Expected changes in maket structure connected with the need of capital.

As mentioned above, chemical industry tends to concentration, this trend has already occurred also in the CR. Any fundamental changes in the market structure after the access into EU are expected. There can arise some problems for SMEs because of their:

- Less economic power than large enterprises
- Insufficient legal, economic, technical and management capacities
- Higher sensitiveness to the enforcement of law and administrative problems
- Insufficient orientation in foreign markets and risk of paying less attention - in contrast to larger enterprises - to the environmental impacts of production

Short-term policy measures related to the individual sectors

The main features of the industrial strategy of the CR. are described in The Sector Operational Programme Industry (SOP Industry), which has been drawn up for the period 2001-2006. It documents projects in the framework of the SOP Industry focusing mainly on support of the competitiveness of Czech industry and preparing it for the use of Structural Funds.

Support of entrepreneurial activities in industry and industrial services, including SMEs

It is necessary to provide support to entities having their own business activities, to assist in their establishment and stabilisation and to support the services (industrial as well as entrepreneurial) provided to these entities. Especially SMEs don't have enough capital and human resources to coordinate their activity in complicated EU businss environment. Nevertheless SMEs are highly sensitive to imperfections of legal system, too.

To meet this objective, the short-term policy should be focused on

Establishment of new businesses (to help to increase the share of SMEs in the overall output of the national economy to a level comparable with that of other advanced market economies).

The short-term policy should consist especially in:

- Facilitate access to capital by SMEs,
- Support of SMEs' innovation activities, especially of those, which enhance productivity of labour and/or afford increased environmental protection,
- Support of those SMEs, which are engaged in business activities assisting in the solution of regional problems,
- Improve access to information, consultancy services and training programmes for SMEs,
- Steps towards the simplification of legislation, speed up the business registration procedure ◎

Industrial services (Support of services, that are directly linked to innovation within the production process or to its management and operation as well as to product innovation).

Short-term policy should focus especially on:

- development of information technologies,
- information networks and databases,
- industrial research and development.

Entrepreneurial/business services (the development of services strengthens the links between business services and manufacturing companies, boosts the performance of the industry sector, improves industry's competitiveness as well as the co-operation of companies with the suppliers of business services, and stimulates modernisation of public administration).

The measures are focused especially on the following:

- development of marketing,
- service parks for businessmen,
- consultancies for exporters,
- development of software products.

Restructuring of the industrial production base while adhering to the principle of sustainable development

The objective of short-term policy should be to make chemical industry competitive again, to increase labour productivity and effectiveness and to reduce the environmental burden of the external environment. Mainly medium-sized and large industrial enterprises face difficulties due to conversion or due to the restructuring of production. The priority embraces relations with subcontractors, business entities and the financial and banking sector.

To meet this objective, the short-term policy should be focused on following component targets

Regions with significant concentration of chemical production Regions with significant concentration of chemical industry are distributed unevenly and, due to on-going industrial conversion, may become a source of instability of the social and economic climate. Regions with significant concentration of chemical production should be identified and support stabilisation programmes drawn up for them.

Industrial co-operation

- development of co-operation of industrial and trade organisations,
- development of SME associations and networks.

Restructuring of businesses, sub-sectors, and individual industries Support should be given to the transformation of businesses in high-risk regions affected by restructuring or regions threatened by conversion to support of structural changes in the manufacturing base, mergers of manufacturing capacities, investments in the existing manufacturing capacities and to minimize negative impact of unemployment**.**

Enhancing the competitiveness of chemical production by the way of increasing the effectiveness of production, Upgrading the technical standard of production and Increasing the market share.

The objective is to achieve transparency and possibly to simplify the above existing structures and material and information flows to cut down the manufacturing costs incurred in the production of goods and services. This objective can be achieve through:

- Management of the production process
- Reduction of energy demands on the manufacturing process
- Optimisation of the production process

Upgrading the technical standard of production (rationalisation of manufacturing programmes, changes in manufacturing technologies and implementation of new know-how).

- Implementation of progressive technologies
- Production based on renewable raw materials available locally
- Technical standard of manufacturing
- Aesthetic standard of manufacturing
- Manufacturing quality

Increasing the market share

This priority comprises the development of new trade strategies as well as a marketing approach to markets with the aim to increase the share of Czech products in the international marketplace.

- Market survey
- Promotion of products
- Opening-up of new markets

Development of human resources in industry

The objective of programmes would be to develop the human potential and to use it to the maximum to enhance the competitiveness of production.

There should be support of lifetime learning of the personnel of industrial companies focused on upgrading their skills especially within the areas of production technology, finance, marketing, financial technologies, information technologies, computer technology and management methods.

Special stress should be put on industrial company management, professions which enhance the quality of supply on the labour market and human resources in small enterprises

Support to research and development and to industrial co-operation, as an important production growth factor, also respecting environmental protection

There should be created closer links to both fundamental and applied chemical research. Especially support of joint projects of entrepreneurs in chemical industry and university research establishments; industrial use of the results of joint research and development, trade in licenses and know-how and industrial utilization of energy-saving, environment-friendly technologies.

The effect of EU accession on the regulatory framework

Law rules relating to chemical industry is possible to divide into two general groups:

- The first group consists of rules regulating the business environment, such as:
    - Business Law
    - Bankruptcy Law
    - Competition Law
    - Revenue Law/Law of Taxations
    - Criminal Law
    - Administrative Procedure
    - Civil Procedure
- The Second group contains regulation of environmental requirements on chemical production.

The main problems of the Czech business environment (as confirms the last Regular Report of Commission) are:

- Bankruptcy legislation and business registration.
- Length of court proceedings,
- Corruption and economic crime
- Public procurement
- Operation of administration and administrative procedure

The full harmonization of the Czech legal system will help to solve those problems. Although big progress has already been done (the Civil Service Act, Administrative Court Proceedings Code, amendments to the Civil Proceedings Code, work on re-codification of criminal and commercial law, establishment of specialized units on corruption and economic crime, amendment to the Public Procurement Act etc.), the situation is still not satisfactory.

Current state of business environment effects especially SMEs, because of their high sensitiveness to the enforcement of law and administrative problems.

Access to EU will strengthen the enforcement of law (introduction of jurisdiction of The European Court of Justice, Court of first Instance, Commission) and will have positive effect on the operation of the Czech judicial and administrative bodies (EU supervision).

Concerning competition, the cooperation between Commission and CR Office for the protection of competition will be even more intensified. The judicature of EU courts becomes binding for competent Czech authorities. It is necessary to mention, that CR Office for the protection of competition is already trying to apply Czech competition law in accordance with EU rules and judicature. Nevertheless problems can be expected in the case of state aid and public procurement.

In the sphere of environmental regulation, chapter Environment has been provisionally closed. The Czech Republic has been granted transitional arrangements for packaging and packaging waste (end 2005) and urban waste, water treatment (end 2010). The Czech Republic is meeting the majority of the commitments it has made in the accession negotiations in this filed. In order to complete preparations for membership, the process of harmonization is continuing and at present the highest importance is given to finalizing transposition and implementation (horizontal legislation, water quality, waste, nature protection, dangerous chemical substances and IPPC), ensure the provision of the necessary financial means, and strengthening overall administrative capacity, in particular at the regional and local level.

Introduction of ecological limits in practice is highly capital spending. Realization of the necessary steps burdens above all the private sector and cannot be effected without state's support (e.g. problem of old environmental burdens in Spolana, a.s., Aliachem, a.s. - Synthesia, Aliachem, a.s. – MCHZ). Serious problems can rise for SMEs. They don't have enough capital and human resources to face new requirements not only on ecological limits, but also on quality standards and the management concerning safety and the environment (ISO 9000, 14000, safety enterprise, EMAS 2). In comparison with SMEs in EU, Czech entities have much less time to implement these standards. Problems could be worse if European Commission radically unifies chemical legislation in the sense of proposals of the so-called White Book.

In accordance with the European development, the chemical industry of the Czech Republic takes part in the Responsible Care Programme.

The works on harmonization of the Czech legislation have made a significant progress. In most cases it is a continuous process, where new EU regulations, which were published during the period 1999 - 2002, are implemented /e.g. new chemical act and relative regulations which are being prepared), in other cases it is a new form of environmental matters treatment according to EU legislation - namely Act on packing and Act on integrated prevention and pollution reduction /IPPC).

Contemporary valid Act No. 157/1998 Coll., *on chemical substances and chemical preparations* has been modified by Act No. 352/1999 Coll., Act No. 132/2000 Coll., Act No. 258/2000 Coll., Act No. 458/2000 Coll., and Act No. 185/2001 Coll. To implement this Act, 1 government regulation and 12 Decrees

• Government regulation No. 258/2001 Coll., modifying government regulation No. 25/1999 Coll., concerning the process of assessment of dangerous chemical substances and preparations, their classification and identifying, and publishes List of classified dangerous chemical substances.

• Decree of the Ministry of Environment No. 283/2001 Coll., fundamentals of correct laboratory practice

• Decree of the Ministry of Agriculture No. 50/2001 Coll., modifying the Decree No. 250/1998 Coll., on registration of chemical substances

• Decree of the Ministry of Agriculture No. 208/2001 Coll., modifying the Decree No. 251/1998 Coll., concerning methods for chemical substances and preparations toxicity testing

• Decree of the Ministry of Environment No. 10/2002, appointing a list of dangerous chemical substances, which can constitute a serious danger for human health and environment

A group of highly toxic substances, which are considered as poisons, is treated by an individual regulation /Government Decree No. 114/2000 Coll., modified by Government Decree No. 20/2002 Coll.

Chemical legislation has been amended by:

• Act No. 120/2002 Coll., on *conditions for introducing biocide preparations and active ingredients*, in force from 1 July 2002 with exceptions listed in article 40 and provisional statements in article 35 of the Act.

Other Acts and provisions in executions have been modified significantly:

• Act No. 153/2000 Coll., on *handling genetically modified micro-organisms* and products and on changes of a number of linked acts, in force from 1 January 2001. The Act is accompanied by 3 Decrees of the Ministry of the Environment

• Act No. 79/1997 Coll., *on drugs* /modified by Act No. 149/2000 Coll., Act. No. 153/2000 Coll., Act No. 258/2000 Coll.), full wording of Act No. 402/2000 Coll., /modified by Act No. 102/2001 Coll., and No. 138/2002 Coll.). An important novel on drugs is being prepared**.**

• Act No. 167/1998 Coll., *on addictive substances* /modified by Act No. 354/1999 Coll., No. 132/2000 Coll., No. 177/2000 Coll., No. 57/2001 Coll., and Act No. 407/2001 Coll.), full wording by Act 167/1998 Coll. by Act No. 55/2002 Coll.

In 2002 changes of two provisions in executions were published in the Collection of Acts.

• Act No. 156/1998 Coll., *on fertilizers*, modified by Act No. 308/2000 Coll., and No. 147/2002 Coll.

In 2000 three Decrees of the Ministry of Agriculture were changed, new Decree No. 474/2000 Coll., on demands on fertilizers, was published in the Collection of Acts.

• Act No. 147/1996 Coll., *on fytopathology* /modified by Act No. 409/2000 Coll. and Act No. 314/2001 Coll.), full wording by Act No. 32/2002 Coll.

In 2001 two Decrees of the Ministry of Agriculture were changed, in 2002 four new Decrees of the Ministry of Agriculture were published /No. 89/2002 Coll., No. 90/2002 Coll., No. 91/2002 Coll., No. 92/2002 Coll.).

• Act No. 22/1997 Coll., *on technical requirements on products* /modified by Act No. 71/2000 Coll., Act No. 102/2001 Coll.). To implement the Act a full range of government regulations was prepared. An extensive upgrading is taking place at the moment.

As regards chemical substances and preparations an important regulation is Government regulation No. 173/1997, amended by Government regulation No. 174/1998 Coll., No. 78/1999 Coll. and No. 323/2000 Coll., and its annexes, where chemical items were reduced, and No. 194/2001 Coll., on technical requirements for aerosol dispersers.

By PECA - Protocol of European Confirmation of Accordance a reciprocal acceptance of conformity and acceptance of industrial products in 10 sectors was agreed by the Czech Republic and EU member states. PECA came in force on 1 July 2001 and its enlargement by other sectors will be possible after full legislation harmonization within these sectors.

A relevant harmonization of Czech legislation according to EU legislation was reached in other six sectors during 2001. It was confirmed by the Government resolution No. 245/2001, which was approved on 14 March 2001. These sectors were proposed to the European Commission to be included into PECA. For the branch manufacturing of chemicals and pharmaceuticals the key importance stays with the sector:

Also environmental legislation has been novelized significantly. At the end of 2001 and beginning of 2002 five new acts were published:

• Act No. 185/2001 Coll., *on waste*, in force from 1 January 2002, with a number of exceptions, was modified by Act No. 477/2001 Coll. 5 Decrees of the Ministry of the Environment were published; the following of them are important for DG branch:

-Decree of the Ministry of the Environment No. 376/2001 Coll., *on dangerous waste assessment*

-Decree of the Ministry of the Environment No. 381/2001 Coll., *the Catalogue of waste*

-Decree of the Ministry of Environment No. 382/2001 Coll., *on details of waste management*

-Decree of the Ministry of the Environment No. 383/2001 Coll*., on PCB*

Management

• Act No. 477/2001 Coll., *on packing*, in force from 1 January 2002, with exception transitive period for fulfilling some duties listed in Article 51 of the Act. The transitive period lasts till 1 July 2002. 1 Government regulation and 3 Decrees amend the Act:

-Government regulation No. 111/2002 Coll., which defines an amount of deposit in selected types of packing, in force from 13 May 2002

-Ministry of Industry and Trade Decree No. 115/2002 Coll., on details of packing management, in force from 9 March 2002

-Ministry of Industry and Trade Decree No. 116/2002 Coll., on marking returnable deposit packing, in force from 1 May 2002

-Ministry of Environment Decree No. 117/2002 Coll., on extent and evidence of packing and providing data from the evidence, in force from 9 April 2002

• Act No. 254/2001 Coll., *on water*, in force from 1 January 2002 /modified by Act No. 76/2002 Coll.). 5 provisions in executions have been published so far.

• Act No. 86/2002 Coll., *on air protection* and . The Act came in force on 1 June 2002. Provisions in executions are being prepared.

• Act No. 76/2002 Coll., *on integrated prevention*, in force from 1 January 2003. Providers that are operating or want to operate the technologies listed in Annex 1 of the Act, are obliged to apply for an integrated permission in the period according to Articles 42 and 43 of the Act. Provisions in executions are being prepared.

Conclusion

SWOT ANALYSIS

Strengths	Weaknesses
Tradition of industrial production	Problematic privatisation
Favourable location at the heart of Europe, proximity of important European markets	Dominance of productions with low added value
Low-cost, skilled and adaptable workforce	Shortage of investment resources
Existing human potential in science and research as a source of innovation	Energy-intensive production
Infrastructure	Lacking business infrastructure for the development and transfer of technologies and for the support of innovation and services
Broad range of chemical products	Unwieldy access to information, consultancy services, vocational education, research, and innovation
Quality of fundamental products comparable with foreign production (but just few in high quality)	Limited geographic mobility of the workforce
Technical standards harmonized with EU legislation	Low labour productivity and value added
State participation on ecological investment	Low share of state aid to industrial research and development in comparison advanced economies
Share of companies with foreign participation in exports	Need of young professionals in chemical industry (high share of employees over fifty).
	Small market
	Import of inputs and raw materials, dependence on petrol imports
	Old technologies
	Low production capacity
	Environmental burden
	Export focus just on few markets
	Loss of markets in post SU countries
	Insufficient experience in foreign trade and insufficient knowledge of markets, mainly on the part of the SMEs
	Lack of marketing information and a low level of marketing activities abroad

Opportunities	Threats
Higher growth rate of technical and technological development	Slow advance in replacing outdated technologies
More intensive technology transfer	Imperfect linkage of production to research and development manifested in the lack of new designs and new technologies where and when needed
Development of industrial services and services which upgrade the business environment	Insufficient quality of industrial information
Development of sectors which generate a high added value	Local shortages of skilled workforce, made even more prominent by poor workforce mobility
Use of relatively a high-skilled workforce in locations affected by restructuring	Absence of a human resources development system and of lifetime education and training and care of the human capital
Implementation of lifetime learning, hand in hand with corresponding changes in the structure, contents, and form of both basic and advanced education	Low share of GDP channelled to expenditures on education, reflecting a low priority this is being accorded in society
Integration of scientific, educational, and production capacities to increase innovation	Persistent lagging behind the developed countries in the sphere of support rendered to science and technology
Direct foreign investments (DFIs) as an important source of capital, technologies and export opportunities for Czech companies	Structural deformations in heavy industries, metalworking and power engineering
Influence of FDI on regional industrial development	Problematic restructuring of traditional sub-sectors
Increase of export through specialisation.	Conservative attitude towards innovation
Better image of Czech producers.	Inadequate work with / use of information
Easier access on foreign markets	Underestimating the importance of operations with financial capital
Higher involvement of Czech enterprisers in the global economy and better utilization of trade opportunities	Negative impact of the existing business environment on investors
Improvement of the competitiveness of Czech producers on the world markets	Own capital in short supply
	Growing competition in the world markets
	Open market to imports from Asia and South America countries with cheaper production
	An insufficiently market oriented approach by the entrepreneurial sector
	Failure to cope with the high requirements and costs associated with the operations of the businesses within the EU single internal market

One of the most important advantages of the Czech chemical industry is low-cost, skilled and adaptable workforce in connection with human potential in science and research (source of innovation). Moreover the Czech Republic is favourably located in the middle of the Europe, no far away from important European markets. During the long tradition of the Czech industry quality infrastructure has been built. Nowadays the Czech chemical industry manufactures a broad range of chemical products, that are (at least the fundamental products) of quality comparable with foreign production. Technical standards of production as well as environmental rules are harmonized with EU legislation.

On the other hand the small Czech economy is dependant upon import of inputs and raw materials as well as upon petrol imports. The export is focused just on few markets, and domestic producers (especially SMEs) don't have enough experiences in foreign trade and sufficient knowledge of markets. Further important problems are dominance of productions with low added value, hand in hand with lack of investment resources and problematic privatization, all which complicate process of restructuring. The competitiveness of domestic production is moreover hindered by unfavourable structure of the production, in which prevails old, energy-intensive productions with environmental burdens. Labor force has low productivity with limited geographical mobility.

The accession to EU will help to improve the image of Czech producers and make their access on foreign markets easier, furthermore it will strengthen involvement of domestic enterprises in the global economy and improve utilization of trade opportunities.

Adoption of all EU treaties, that create customs unions, free trade areas and preferential tariffs regimes with third countries, as a result of accession, will have substantial impact. The expected effect is not only easier access of Czech products on the markets of those countries but also higher degree of competition from their part on the Czech domestic market and so importation of cheap chemical products (especially those with low added value) from Asia, South America and others is expected. Here can rise serious problem for domestic producers. They should keep and speed up process of restructuring and specialisation towards to the products with higher added value, that are much more competitive. A way to achieve this goal could more intensive technology transfer, which is expected.

Accession to EU can increase innovations also through integration of scientific, educational, and production capacities hand in hand with corresponding changes in the structure, contents, and form of both basic and advanced education.

Full harmonization of Czech laws, together with introduction of jurisdiction of The European Court of Justice, Court of first Instance and Commission, will help to solve current problems in the field of bankruptcy legislation, business registration, length of court proceedings, corruption and economic crime, public procurement and operation of administration and administrative procedure and will have positive effects on the operation of the Czech judicial and administrative bodies.

List of References

www.mpo.cz

www.schp.cz

www.czechinvest.cz

www.compet.cz