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# Vinythai:

# A Case Study on the Competitive Strategy at Entry and the Impact of Changes in the Economic Environment [1]

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# 1. Introduction

Vinythai is a Thai joint venture company set up by the Belgian Solvay Group and the Charoen Pokphand Group (C.P.) of Thailand. It was established in 1988 with the support of the Thai Board of Investment (BOI) to operate in the promoted intermediate and downstream petrochemical industry. The joint venture is located in the Map Ta Phut Industrial Estate in Rayong, Eastern Seaboard, at a distance of 250 km from Bangkok. The company produces the semi-finished products ethylene dichloride (EDC) and vinyl chloride monomer (VCM) on the one hand, and polyvinyl chloride (PVC), as well as its by-product caustic soda on the other hand (for a description of the products and production process, see annex 1). This case study, which is an extension of the case study on the joint venture establishment, focuses on the competitive strategies and the consequences of Vinythai and of its main competitor on the Thai market, in particular the price-undercutting movements that were triggered by Vinythai's entry. In addition, the business environment factors that influenced the business strategies adopted are analysed and assessed. One such change in the external economic environment is the downward pressure on prices and profits, as a consequence of the word-wide recession and the cyclic downturn of the industry in the years 1991-1994. Another factor is the ASEAN Economic Ministers (AEM) 1994 decision to put petrochemical products on the fast track list of tariff reductions under the ASEAN Free Trade Agreement (AFTA), implying that Thailand's infant industry protection of the petrochemicals was gradually eliminated, thereby seriously affecting Vinythai's expected profitability. Finally, the impact of the sharp devaluation of the Baht since July 2, 1997, due to the floating of the Thai currency, is also investigated in the present case study.

# 2. Some characteristics of the petrochemical industry and the external environment in Thailand

## 2.1 Long and complex value chain

Petrochemicals are relatively pure, easily identifiable, substances, derived from petroleum, and used in the chemical trade. In fact, transformation and separation processes convert original products in more complex final products. Moreover, petrochemical companies are increasingly integrated vertically as well as and horizontally. Oil companies have entered the chemical business, and vice versa, and of course the industry as a whole is undergoing rapid expansion and structural changes.

The most basic raw materials supplied by the petroleum refineries or natural gas companies are LPG, natural gas, naphtha, liquid distillate, distillate form special cracking processes, and selected or isomerised cyclic fractions for aromatic products. These products undergo a first transformation into monomers, such as ethylene and propylene, which are sent to intermediate or downstream units to be linked together or polymerised into plastic powder, resins and pellets. In turn, the latter products are used for the production of plastics and synthetics for further industrial use.

Petrochemicals can be broadly classified into three categories:

- Upstream products, e.g. olefins (ethylene, propylene and Mixed C4) and aromatics (benzene, toluene and mixed xylenes).
- Intermediate products, e.g. Vinylchloride monomer (VCM), styrene, Pure Terephthalic Acid (PTA), Phthalic Anhydride (PA), Ethylene Glycol (EG) etc.,
- Downstream products: i.e. a wide range of raw materials for the plastic and textile industry including Polyvinylchloride (PVC), Polyethylene (PE), Polypropylene (PP), Acrylonitrile-Butadiene Styrene (ABS )and polyester [1].

## 2.2 Interrelation of products and sectors (chemical, petrochemical and plastics) (for a description of the products and productions process, see Annex 1)

The main products at issue in this case study are caustic soda and PVC. They are basically joint products, since for every 1,000 kg of PVC produced, about 666 kg of caustic soda are also produced.

There exists an inverted relationship between the market and price of chlorine, a raw material in the production of ethylene dichloride (EDC) and indirectly PVC, and the market and price of caustic soda.If the price of chlorine increases, e.g. because of a tightness in the supply, the effect on caustic soda will be an oversupply and a decrease in its price.

The supply/demand balances of chlorine, caustic soda, EDC and VCM have to be consolidated in order to assess the effect on PVC. As already mentioned, caustic soda and chlorine, are jointly produced during the same production process. However, if the demand for chlorine is larger than the demand for caustic soda, the inventories of chlorine will decrease as the result of the upward effect on its price. This in turn will increase the production cost/unit for PVC as well.

## 2.3 High price sensitivity and substitutability

Caustic soda is a by-product in the production of PVC, while soda ash (which is a chemical used to neutralize acids of chemical reactions) is produced independently of PVC. At a certain price level, substitution between caustic soda and soda ash can develop. Thus, when there is an oversupply of caustic soda, and an ensuing reduction of the market price, soda ash can be used as a substitute, which in turn will lead to an increasing demand for caustic soda and consequently result in a price increase.

PVC and poly-olefin can be substituted for fiber-cement pipes used in construction.

## 2.4 Oligopolistic and segmented petrochemical market in Thailand [1].

From the moment the Thai government launched the petrochemical industry, it has continued to play a major role in directing, supporting and protecting the industry on the one hand through tariff barriers and on the other hand by incentives from the Board of Investment (BOI) to a small number of privileged companies.

**Box 1:**
**The Thai government's support to the petrochemical industry: NPC-1 and NPC-2**

The petrochemical industry was first established in Thailand in the early 1950s when a few processing manufacturers started producing there. Its development during the first twenty years was slow, and relied almost entirely on imported raw materials. In the 1980s, when major industrial sectors, such as the automotive and electronic industries, boosted the demand for plastic processing and expanded rapidly, the need for a national petrochemical and plastic industry had become one of Thailand's top economic priorities.

The government, through the Board of Investment (BOI), decided to grant tax and other incentives to a limited number of companies under the National Petrochemical Complex (NPC). The first integrated petrochemical complex, NPC-1, was established in 1983 at the Map Ta Phut Industrial Estate, Rayong Province. Four private companies[1] were selected to invest in the production of plastic or other petrochemical products of the intermediate and downstream petrochemical industry and one state-owned company, The Petroleum Authority of Thailand (PTT), for the investment in an upstream unit (an olefin plant operated by NPC). While all of these firms received BOI incentives, the government, however, obliged the four private companies to co-invest in NPC, together with PTT, and to buy from NPC 73.3% of their total needs of ethylene and propylene at fixed prices, in a contract based on a "cost plus" formula. NPC-1 became fully operational in 1990. The fast growth in plastic consumption, stimulated by Thailand's rapid economic growth, led to the establishment of Thailand's second petrochemical complex, NPC-2, in 1987. NPC-2 consists of two upstream units, an olefin unit (operated by Thai Olefins Company, TOC) and an aromatics plant; three intermediate industries; and eight downstream units producing plastic and synthetics. TOC started commercial production in early 1995, while the majority of the downstream plants were completed between 1991 and 1995. Also, under NPC-2, the intermediate and downstream units were obliged to take shares in the upstream unit. This price agreement, however, is considered to present a better deal than the one under NPC-1, as the raw material prices are based on world market prices (75% of the total demand of ethylene and propylene had to be bought from TOC at US Gulf contract price + 10%). This made the production more cost competitive as compared to imported products. As NPC-2, however, still limited competition, the market remained segmented (see Case Study "Vinythai: a case study on the establishment of a petrochemical joint venture between a Belgian and a Thai company").

In addition to the incentives granted by the BOI, the government also introduced high import duties on imported petrochemicals for a period of eight years under NPC-1 and ten years under NPC-2 in order to enable local petrochemical manufacturers to compete with imported products. The tariff rate on imported plastic powder was set at 40%, while for raw materials, such as ethylene and propylene, it reached 20%. It was assumed that the contribution of tax incentives and high tariffs would allow the investors in the petrochemical industry in Thailand to bear the huge financial costs for setting up successful activities.

This policy has lead to a segmented structure of the industry. When the Thai petrochemical industry faced the last downturn in the years 1991-94 (historically the petrochemical industry shows a cycle of 7-8 years), both the segmented structure of the industry and the pricing policy under NPC-1 inhibited optimisation. However, when NPC-2 was introduced in 1989, the Thai petrochemical industry started to operate on the principle that pricing should reflect the realities of the global marketplace. Yet, competition remained limited and the industrial segmentation continued. When petrochemical experts and market players demanded a more flexible industrial structure to allow the sector to compete in the global markets, the Ministry of Industry announced in June 1994 policy guidelines aimed at liberalising and improving competitiveness. In May 1995, new policies were introduced and new liberalisation measures were taken, which liberalised the Thai petrochemical industry even further [1].

[1] Thai Plastic and Chemicals CO.. Ltd. (T PC); Thai Polyethylene CO., Ltd. (TPE), Thai Petrochemical Industry Co., Ltd. (TPI); and HMC Polymers (HMC).

# 3. Business environment at time of Vinythai's entry (1992)

Although Vinythai was established in December 1988, it started PVC production only in July 1992. At that time the business environment had already undergone a number of important changes, notably with regard to the supply of raw materials and the market situation of PVC.

## 3.1 Supply situation of raw materials

Phase I of the integrated Vinythai project consisted of two PVC resin plants with a name plate annual capacity of 115,000 tons of suspension grade of PVC and 20,000 tons of emulsion and micro suspension grade PVC. It employed imported VCM as raw material, which was largely purchased in the international market, only occasionally on the spot market. Solvay is not a supplier of VCM. In 1992, imported VCM was more expensive than locally produced VCM, because of the high import tariffs imposed. Therefore, as VCM constituted about 80% of Vinythai's PVC production costs, making it higher than that of its competitors, Vinythai urged the government to reduce the import duty on VCM from 20 percent to 10 percent. The BOI agreed in principle, but in 1995, duties were as high as 15 percent [3] and [4].

In addition, in order to get continuous supply of VCM, Vinythai entered into supply agreements with three large Japanese trading companies with a strong position in the international VCM market. These were: Mitsubishi Corporation (agreement signed on 25 October 1990), Mitsui & Co. (1 June 1992) and Marubeni Co., Ltd. (1 March 1994) respectively [4, p.126]. The fact that competitor TPC was also a partner of Mitsui was not considered to be a problem for Vinythai. According to Vinythai's current Managing Director, J.P. Puskas, "Mitsui was one of the three chosen suppliers because they have a very strong market position. They have a very efficient logistic system, know how, and are very flexible and very competitive in terms of freight among other things. They also are very reliable in getting information on marketing trends."

These supply arrangements were needed to ensure that Vinythai would have adequate supplies of VCM until the completion of Phase II of its integrated project, which consists of integrating its own VCM production unit. Vinythai planned to commence commercial operation of the Phase II Project by November of 1995 [4, p.91 and 155]. The construction for this stage started on 14 September 1993, but production only commenced in the third quarter of 1996 [5]. In the event that the above-mentioned trading companies would be unable to supply, Vinythai expected Solvay S.A., its Belgian parent company, to supply VCM through Solvay's international network [4, p.92].

As for the other raw materials, Vinythai is like the other downstream petrochemical units of NPC-1 and NPC-2 obliged to buy a certain amount of its requirements of ethylene and propylene from the NPC cracker at agreed prices. The remaining quantities can be bought at the spot market.

### 3.2 PVC market situation

Contrary to the 1988-1990 period, the downturn in the world economic situation in 1992 was unfavourable to the growth of the Thai economy. The high GDP growth rates were replaced by near stagnation in 1991-1993, when first the U.S. and afterwards Western Europe went into a recession. The international economic performance during the entire first half of the 1990s was also held back by the stagnation of Japan and by the economic implosion of the former Soviet Union.

As the economies of the industrialised countries recovered at a slower rate than anticipated, the demand for PVC in the major markets such as Europe and Japan did not sufficiently expand to match the massive increase in the production capacity. Demand in Japan shrank by 4 %, while in Western Europe it remained constant. On the contrary, the growth in the Asia Pacific region and the US was satisfactory. Asia became the world's largest PVC market in 1993, taking over the leadership position from Europe. Asia's PVC consumption rose to about 6.63 million TPY, compared to 5.03 million tons and 5.18 million tons in Europe and North America respectively.

Although the Thai GDP grew steadily at a rate of 7.5%, the Thai PVC market remained depressed. This was due to a substantial over-supply at the world level and much slower growth in the construction sector in Thailand and in the world, the largest purchaser of PVC, taking up around 60% of the total local purchases. As a result of this excess supply, growth in the construction sector in Thailand slowed down to 4.7% compared to 13.6% in 1991 (see annex 4). That the market price of PVC in Southeast Asia remained at a historically low level was also due to strong competition from the USA, Japan and South Korea. Finally, also some BOI–promoted companies that were allowed to import raw materials exempt from import duty for the manufacturing of export items, reportedly sold a lot of these PVC imports illegally, thereby distorting the price of locally produced PVC.

The lower prices offered by local producers induced buyers to locally purchase the materials rather than to import, causing the PVC imports in 1992 to drop 30% in volume and a 49% in value. These imports of PVC in Thailand mainly originated from Japan, Taiwan, the US, Korea and Belgium. PVC exports on the other hand amounted to 25,000 tons at a value of 376 million Baht, which was about the same level as in 1991[2]. The major export markets were located in Asia, more in particular in Vietnam, Malaysia, Bangladesh, Pakistan and Singapore.

## 4. Competitive situation at the time of entry by Vinythai

Prior to the start-up of the production by Vinythai in Thailand, TPC[3], with its two PVC plants[4], had been the only producer of PVC suspension in Thailand for 20 years. Apart from imports, TPC did not face any real competition in Thailand. In 1990, TPC also began to produce part of the VCM it needed (140,000 TPY) itself. At that time TPC did not produce PVC emulsions. Compared to Vinythai, TPC's 'competitive' advantage for PVC suspension was based on the following:

[2] In 1992 25,4 Baht = 1US$
[3] TPC was incorporated in 1966 with 10 million Baht (or 384 615.50 USD) registered capital.

## 4.1 Alleged lower depreciation cost

While part of TPC's plant was already depreciated, Vinythai still needed to depreciate three plants, at a rate of more than 10% per year. This lower financial cost of TPC due to its higher accumulated depreciation should, however, be seriously qualified. Table 1 shows that in 1993 TPC's property, land and equipment was 36% depreciated against only 4.4% at Vinythai. The annual burden of depreciation and amortisation, measured as a ratio of total revenue on total assets was, however, considerably lower at Vinythai in the same year. Vinythai's lower depreciation burden obviously was the result of its fast expansion of sales and assets, certainly when compared with TPC.

**Table 1: Depreciation and amortisation at Vinythai and TPC, 1993 and 1994**

| | TPC | | Vinythai | |
|---|---|---|---|---|
| | **1993** | **1994** | **1993** | **1994** |
| Accumulated depreciation | 1,836.5 MBHT | 2,230.0 MBHT | 223.4 MBHT | 380.6 MBHT |
| Property, land and equipment at cost | 5,058.0 MBHT | 5,278.3 MBHT | 5,100.2 MBHT | 4,689.6 MBHT |
| Annual Depreciation and amortisation | 546.4 MBHT | 567.8 MBHT | 172.4 MBHT | 176.4 MBHT |
| Total revenue | 4,674.7 MBHT | 5,109.9 MBHT | 1,894.0 MBHT | 3,697.3 MBHT |
| Total assets | 6,531.2 MBHT | 6,916.2 MBHT | 7,092.0 MBHT | 12,114.6 MBHT |
| Accumulated depreciation as a share of investment at cost | 36.6% | 42.2% | 4.4% | 8.1% |
| Annual depreciation and amorisation as a % of annual revenue | 11.7% | 11.1% | 9.1% | 4.8% |
| Annual depreciation and amortisation as a % of total assets | 8.4% | 8.2% | 2.4% | 1.5% |

Source: TPC Annual Report 1993
Vinythai Annual Report 1994
Information Memorandum Vinythai prepared in the light of a capital increase, 16 December 1994.

## 4.2 Lower financial cost

The proportion of short and long term liabilities in the total equity and liabilities of TPC in 1992 amounted to 32.3% and 23% respectively. As Vinythai only started to operate in this same year, it is more appropriate to compare the companies on the basis of more recent data taking into account that TPC started about two decades earlier than Vinythai. Table 2 compares some financial data of TPC and Vinythai for 1997 and it clearly shows that TPC's financial burden is much lower than in case of the latter.

**Table 2: Selected financial ratios for TPC and Vinythai, 1997**

| | TPC | Vinythai |
|---|---|---|
| Short term liabilities to total assets | 35.5% | 15.4% |
| Long term liabilities to total assets | 37.3% | 84.0% |
| Interest payments to net revenue before interest payments | 66.1% | 81.2% |

Source: Annual Reports 1997 of Vinythai and TPC.

## 4.3 Larger production capacity

Under NPC-1, TPC produced, in addition to part of its own chlorine (about 22,000 TPY versus a total need of 83,000 TPY), 200,000 TPY of PVC suspension; 140,000 TPY of VCM (since 1990); 43,000 TPY of ethylene from NPC and 82,000 TPY of EDC. As a newcomer to the Thai PVC suspension

[4] One plant in Samut Prakan producing PVC resin since 1971 and one in Rayong as part of a BOI PVC/VCM project under NPC-1, operational since 1990.

market, Vinythai wanted to establish in a different way: (1) Rather than adopting a price-cutting strategy, Vinythai chose to emphasise international standard quality and variety, especially because this also had been a condition for BOI approval of its project. (2) Consistency of quality, another factor by which Vinythai wanted to differentiate itself from TPC. Because converter plants of PVC were becoming more and more automated, a consistent quality did no longer oblige them to adjust their equipment all the time. Since Solvay's technology was more recent and more advanced than TPC's, Vinythai could deliver much more consistent quality. In order to enable quality control as a competitive advantage, Vinythai built a product testing laboratory, which operated under the supervision of experts. Vinythai also sends product samples to Solvay S.A., for quality control purposes to ensure that the PVC produced is comparable to the worldwide standard. In November 1995, Vinythai also launched an ISO-9002 Certification Project for its manufacturing process and product quality, which was accepted in mid-1997. (3) Another factor for differentiation pursued by Vinythai, is quality of service, i.e. quality related to marketing and sales, delivery time and after-sales technical support. Vinythai was the first company in Thailand to introduce a Customer Technical Services Division (CTS), which develops new grades of PVC to better meet customers' needs. In addition, Vinythai received considerable support from the research centre of Solvay in Belgium for the development of new product applications and new grades. Having been a monopolist, TPC was rather conservative and slow to respond to customers' needs. After Vinythai entered the Thai market, however, TPC established its own CTS as well and more or less imitated Vinythai's marketing policy. TPC remained less flexible than Vinythai, however, in adjusting to the particular customers' need, mainly because it could not benefit from international research efforts and contacts and because it has a much larger structure.

The sharp growth of PVC consumption in numerous downstream industries in Thailand allowed Vinythai to establish itself in the market rather easily. After all, Vinythai was the country's first producer of PVC emulsion. Yet, its entry into Thailand's PVC market lead to a cut-throat price competition with TPC. Competition was aggravated by the widespread availability of smuggled PVC, with some BOI promoted companies selling duty-free imports illegally [5]. Moreover, the international price of PVC at that time was at rock bottom (see higher). In 1993, the PVC industry in Thailand experienced its severest recession in 5 years.

In spite of these very challenging circumstances, TPC managed to operate its plants practically at full capacity and to increase its domestic sales volume of PVC suspension, including that of PVC compounds, to 150,000 tons, up 15.8% over the previous year. In 1992, it maintained a market share of 60%, compared with 75-80% during the previous years. Twenty percent of the market was commanded by Vinythai, while the remaining 20% was taken up by imports. TPC's profits, however, were reduced quite substantially.

To counter the entry on the Thai market of Vinythai and in order to protect its position as market leader and to take advantage of the fast-growing market for PVC, TPC decided to double its capacity for both PVC suspension and VCM. It also launched several new grades of PVC suspension and acquired a 35% stake in the equity capital of Riken (Thailand) Co., Ltd., a joint venture with Riken Vinyl Industry Company Ltd. of Japan, producing special grade PVC compound. TPC also followed Vinythai in the differentiation into PVC emulsion, by establishing TPC-OXY Co., Lt. This latter company was set up

jointly with Occidental Chemical Corporation[5] of the United States, the sixth-largest petrochemical producer in the US and also an experienced PVC producer, to work on a PVC emulsion project in the Map Tha Put area in Rayong [7]. Occidental was preferred over Mitsui, which is a major shareholder of TOC and the technology licensor for TPC's PVC suspension plant in Samut Prakan. One factor in favor of Occidental was that TPC considered its know how of PVC emulsion as superior to that of Mitsui. However, until recently Occidental Chemical Corporation had not sold any PVC emulsion in the region. According to an industrial analyst, however, the real reason might be that Thai industrialists in general prefer joint ventures with US and European companies to Japanese partners, which already control a large share of the market in Asia, because they are likely to provide them with better growth opportunities [6]. In total, 1.25 billion Baht was invested in the joint venture: 300 million Baht for construction of the building, 650 million Baht for machinery and 300 million Baht for pre-operational expenses. TPC holds a 51% stake and Occidental 49%. The venture represented a strategic expansion for TPC to broaden its production base and came amid growing competition in the local PVC industry. TPC-OXY decided to only partially integrate the production process (see Box 2).

**Box 2:**
**Plastics firm to integrate**

TPC- OXY, a US-Thai joint venture, believes it can hold its own by following a policy of partial integration. "In the present situation we do not believe total integration will work for us. Our parent company, TPC, has proved that," TPC-OXY managing director Thongchai Benjarongkij said. Last year, chemicals from Vinythai Plc. suffered huge losses due to the fluctuation of vinylchloride monomer (VCM) and polyvinylchloride (PVC) prices. TPC decided to produce its own VCM, which is used in the manufacture of PVC, as part of a plan to control a larger section of the production chain. Unfortunately, the price of VCM has dropped recently while the costs of production of chemicals have risen because of high import expenditures. "We could not determine which principle was right. But in Thailand, where the government's policy frequently changes, we chose to partially integrate our production. It is simply a question of trying to keep the total costs as low as possible". TPC-OXY's partial integration meant that the company could chose to get its VCM from its parent company, TPC, or from abroad. "If import prices increase we would immediately turn to supplies from TPC. We would do the reverse if the domestic price of VCM rises", declared TPC-OXY's managing director [8].

The project received promotional privileges from the BOI and would involve an initial production capacity of 22,500 TPY and the balance would be exported. Of its total output, TPC-OXY intended to export 50% to the following three groups of countries: (a) ASEAN (Singapore, Indonesia), (b) Hong Kong and China, and (c) Australia and New Zealand. Commercial production was planned to start in 1997. Between 1993, when TPC-OXY was established and 1997, the company imported already a certain amount of PVC emulsion for redistribution, both within Thailand and overseas, in order to prepare a market network [8].

TPC also entered the Vietnamese market by establishing a liaison office in Ho Chi Minh City for market information gathering purposes. In the long run, in view of Thailand's role as leader in former Indo-

[5] Occidental Chemical Corporation (Oxychem), is the chemical arm of Occidental Petroleum Corporation and a diversified manufacturer of commodity chemicals, plastic and specialty products. The largest merchant marketer of chlorine in the USA and the third largest producer of PVC resins, Oxychem is also the world's largest producer of potassium hydroxide, chlorinated isocyanurates and resorcinal. It is the world's largest marketer of EDC, the number one US producer of chrome chemicals and the number two US producer of VCM.

china, a continued expansion was considered needed to meet the demand there, as peace had come to most of those countries and as they were focusing on their restoration and development. Vietnam especially was considered a big potential market. In 1993, an agreement was signed with Vietnam Plastic Corporation to establish the joint venture VIET-THAI PLASTCHEM Co., Ltd. in order to invest in PVC compound manufacturing in Vietnam (planned production of 6,000 TPY of PVC compound). Commercial production was scheduled to start in 1996.

## 5. Implementation of the second stage of the integrated project by Vinythai (1994)

The price of VCM strongly depends on the world market price of ethylene on the one hand and world demand for PVC on the other, as VCM is only used in the production of PVC. Therefore, Vinythai wanted to establish integrated production and hence, to control the future cost of production and supply of VCM by setting up its own VCM and Chlor-Alkali plant in a second phase of the BOI approved project [9], [10]. Vinythai planned to start operation of Phase II by November 1995. Because of political uncertainty in Thailand (the Black May Events of 1993 in particular), however, Solvay delayed the decision to start the second phase. Also other factors contributed to Solvay's delay, such as the consequences of the Gulf war in 1991 and the world wide recession in 1993 with resulting decreasing demand and oversupply in the industry. In addition, PVC plastic world market prices fluctuated enormously, because of raw material shortages caused by accidents in the Exxon and Shell plants in the USA during July and August 1994 respectively. Finally, the financial difficulties of TOC, the NPC-2 cracker in which Vinythai held shares, also contributed to Vinythai's decision to postpone the second phase of the project.

At last, the construction of the two additional production units started in September 1993, while the operational stage went ahead in July 1996:

(a) Unit 1 consists of a 2,500 Million Baht Chlor-Alkali plant (also called "electrolysis unit") producing its own chlorine and the by-product caustic soda, on the basis of the most recent and efficient technology. The new technology uses 20 to 25% less energy and needs a smaller investment compared with the two older existing technologies. It was bought from the Japanese company, Asahi Glass Co. Ltd., one of the leaders in this domain. A lump sum of 1,750,000 DEM (1,173,200 USD) was paid for the license and another 2,750,000 DEM (1,843,600 USD) for technical assistance. The name plate annual capacity is 87,500 and 98,000 tons of chlorine and caustic soda respectively. While all of the chlorine produced will be used for VCM production, the by-product, caustic soda, can be sold domestically and abroad. As a result, the number of domestic producers of caustic soda in Thailand amounted to five[6].

Although the new production capacity of Vinythai would entail an excess supply in the domestic market, competition in the caustic soda production industry did not increase correspondingly, as Vinythai

[6] Thai-Asahi Chemicals Co., Ltd.; Siam Occidental Electrochemical Co., Ltd.; TPC; Vinythai and Thai Fermentation Industry Co., Ltd. However, the latter produces caustic soda primarily for its own use. The first three compa-

exported its surplus caustic soda, with co-operation from Solvay to other Asian countries and especially Australia, one of the world's largest importers of caustic soda. Also Vinythai had already been importing and distributing caustic soda in Thailand since 1993, in order to create its future customer base in Thailand for this product. These former imports were replaced from its new production basis in Thailand.

To avoid uncertainties in the procurement of pure salt for chlorine production, Vinythai invested in Pimai Salt Co. Ltd., a Thai. 1.6 billion Baht joint venture, in which it holds 36.8% of the shares (20.4% in 1997). For Vinythai, this constitutes an upstream integration of its activities. The other partners in the joint venture are: Thai Asahi Chemical Group (Thasco) (37.9%); the refining company Thai Refined Salt Co. Ltd. (TRS) (25.3%), most shareholders of which are identical to those of Thasco[7]; and some Thai partners. Thasco and TRS both represent the Asahi Glass Group [11]. Pimai Salt was established on 4 August 1994 and expected to be operational by the end of 1995, with a production capacity of 600,000 TPY.

This strategic partnership agreement surprised industry observers, since Thasco is controlled by the Srifuengfung family, which holds a substantial stake in TPC, the only domestic competitor of Vinythai, although as the Srifuengfung family is a silent partner and without playing an active role in the decision making in TPC [6].

In October 1994, Vinythai has entered into a purified salt supply agreement to secure the procurement of this essential raw material: it agreed to annually take from the mine 175,000 tons of industrial salt.

(b) Unit 2, a 3,200 Million Baht (126 million US Dollars) VCM plant. The VCM technology was bought from Solvay at a lump sum of 4,000,000 DEM (2,681,600 USD)[8]. An additional 5,500,000 DEM (3,687,200 USD) was paid for the services included in the VCM-Technical Assistance Agreement.

The plant is required to take 69,000 TPY of ethylene from Thai Olefins Company Ltd., the cracker under NPC-2, of which Vinythai was more or less forced to become shareholder, as asked by the government (see above) [4, p 92]. The state-owned Petroleum Authority of Thailand (PTT) was to become the major shareholder of the cracker, in addition to its majority shareholding position in NPC-1. Solvay did not believe in the viability of the investment, because of the high investment cost of a cracker operating on non-competitive and imported naphtha and had told this to the government. However, as all other companies did comply with the same request, Vinythai also became a minor shareholder of TOC (5% of shares) on August 28, 1989, by investing in TOC 330.62 million Baht. Vinythai is allowed to buy the remainder of its demand for ethylene from NPC-1 or to import it from abroad. However, TOC has the pre-emptive right to offer such excess amount for sale [5, p. 127].

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nies account for almost 90 percent of the total domestic production capacity with Thai-Asahi Chemicals Co., Ltd. being the largest domestic producer with a market share of over 50 percent at the end of 1994.

[7] According to industry sources, the only area in Thailand with reserves of high quality salt is located in the Pimai district, Nakorn Ratchasima province, while Thasco is the only group which acquired from the Ministry of Industry the salt mining concession for the whole Pimai area many years ago [6].

[8] The USD/DEM exchange rate was 0.697593 and 0.643199 in 1995 and 1996 respectively (or 0.6704 on average).

In December 1992, Vinythai entered into the Olefins Sales Agreement, to secure the procurement of ethylene for its own production. With 69,000 TPY of ethylene supplied by Thai Olefins, and 87,500 tons of chlorine supplied by the electrolysis, the company has a name plate capacity of VCM of 140,000 TPY. This is the same nameplate as TPC had in the beginning.

Also electricity is produced locally in the Map Tha Put area through the Cogeneration Company (COCO), a company producing electricity and steam, with which Vinythai has a long-term[9] contract since November 1994. Its plant is operating just near Vinythai's facilities.

This means that Vinythai is relying now totally on domestic supply of raw materials. Vinythai conceived this of utmost importance to have a strong competitive position for export.

The reaction of TPC to the integration of Vinythai and further developments were as follows:

- Registered the conversion into a Public Company Ltd.
- Increase of registered capital to Baht 500 million.
- Established a joint venture company in Vietnam, named "Mitsui Vina Plastic & Chemicals Corp., Ltd." with Mitsui & Co., Ltd., Mitsui Toatsu Chemicals Inc. and companies in Vietnam holding 24% shares to produce 80,000 TPY of PVC resin in Vietnam. Commercial production is to start in 1998.
- The construction of PVC resin production line #7 to produce an additional 80,000 tons of the product was commenced with scheduled completion in May 1996. Commercial production started in January 1997.
- Repealed the resolution of the Capital Increase from Baht 400 million up to Baht 1,600 million by amending the registered capital of the company from Baht 400 million to Baht 500 million.
- In R&D, TPC set up a R&D Service Center offering customers and users comprehensive services in analyzing and testing of products.

## 6. The external environment in 1995

Changes in the external environment facing PVC producers in Thailand were linked to the depression in the world PVC market, Thailand's competitiveness and the government decision on the implementation of the ASEAN Free Trade Area agreement.

(a) Despite capacity expansions, the world supply still remained limited. It was expected that the price of PVC resins would continue to rise due to the expansion of demand in the world market, while the expansion of supply was limited. But what happened was the opposite: the PVC market became very depressed again in 1995 and 1996.

Although the Thai economy registered a high growth rate of 8.6% and the industrial sector experienced a high growth rate of 11%, the PVC industry did not follow the same trend. On the contrary, PVC resins consumption did not increase compared to 1994 (see annex 3, table 3).

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[9] The contract came into force as of 22 November 1994, and remains in full force and effect for an initial period of fifteen years from the start-up period [4, p. 136].

## 6.1 Reduction in demand - reasons

As the exchange rate of the Baht was partially linked to the USD and the inflation rate was much higher in Thailand than it was in the USA, and as wages in Thailand's petrochemical industry were increasing dramatically (at 12% per year)[10], its output became less competitive in the world market.

Another factor that contributed to the reduction in demand was the purchase pattern in 1994. In that year, a large amount of PVC resins were purchased for stockpiling, as the PVC price was increasing. PVC resins purchase in 1994 was 30% higher than in 1993, resulting in large stocks of PVC resins into 1995.

On the local market, demand from the construction sector decreased, as the growth in the construction sector shrank to 10.7%, relatively low in comparison with previous years (see annex 4). Factors contributing to the decline were the delay in government spending on investments related to the construction industry, the countermeasures taken by the government to contain the problems of inflation and Thailand’s current account deficit as well as stringent credit control on housing projects by commercial banks.

## 6.2 Export

Thailand’s PVC export volume in 1995 was 51,400 tons, a 110% increase compared to 1994. In value, however, the 950 million Baht exports of 1995 represented only 55% increase. Important export markets were Malaysia, Vietnam, Bangladesh, Pakistan, Singapore and other countries in the Asian region.

On the export market, Chinese PVC imports dropped severely. China, a big market for plastic resins, announced a change in import regulations on plastic resins, including PVC. This resulted in the decrease of PVC imports to China. In addition, PVC markets in the United States and Europe began to slow down, causing an excess of plastic resins for export to Asian markets. Vinythai believed that the local PVC market growth rate of 15% per year and the price situation would stabilise as China controlled its rapid growth.

In addition, Thailand lost competitive advantage for export, especially to Europe, where leather and plastics products graduated from the EU GSP scheme, causing again reduction in demand for PVC.

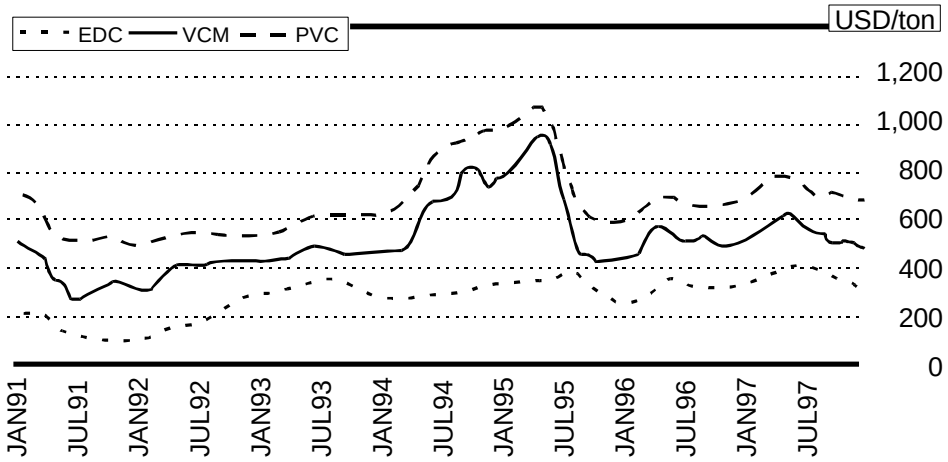
## 6.3 Increase in supply

On the other hand, more PVC was available, mostly from the USA, as the strong profitability for the vinyl industry in 1994 and early 1995 encouraged the addition of PVC capacity around the world.

The result of these market conditions was the rapid reduction of the price of PVC until the end of the third quarter of 1995. In the third quarter, the cost of sales amounted to 112 percent of sales com-

pared to 76 percent the year before, due to the purchase price of VCM. VCM accounts for 85 percent of production costs and, being in tight supply, its price had risen since the second quarter. Purchases of VCM need to be committed up to three months in advance. With PVC prices falling substantially, the PVC-VCM spread in the third quarter dropped to an extremely low level. The PVC situation started to pick up in the beginning of the fourth quarter, along with other industries and PVC prices have become more stable up to the end of 1995 (see figure 1).

**Figure 1: PVC-VCM-EDC FAR-EAST PRICE HISTORY**




Source: Vinythai Annual Report 1997, p. 21.

Competition among the domestic PVC makers seemed to settle down since the second quarter of 1994, as evidenced by the narrowing gap between domestic and world price of the PVC products.

(b) In January 1995, the government announced import duty reductions for petrochemical products from 40% to 30% on PVC and 20% to 15% on ethylene, as a consequence of commitments made under the ASEAN Free Trade Area (AFTA) (see Box 3), the Uruguay Round of the GATT and the trade liberalisation of the Asia Pacific Economic Council (APEC).

To facilitate the immediate implementation of the CEPT Scheme, the Heads of State at the Fourth ASEAN Summit in September 1994 identified fifteen product groups to be subjected to a faster pace of tariff reductions, i.e. the so-called fast track. Plastics are among these products.

Thailand committed itself to liberalise its petrochemical market for other ASEAN countries by the year 2003. The scheduled tariff reductions for PVC are from 40% to 30% in January 1995, to 20% in January 1997 and to only 5% by 2003. Imports from non-member countries would be further subjected to a 40% import duty. Indonesia and Malaysia, however, have excluded most of their petrochemical products from AFTA, which means that they further protect their national petrochemical markets until 2003. However, should they fail to reduce tariffs by the deadline set by AFTA, other ASEAN countries will not extend them the special treatment.

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[10] Because of the shortage of supply of chemical engineers in Thailand.

**Box 3**
**ASEAN – AFTA**

In January 1992, ASEAN member countries launched in Singapore a Common Effective Preferential Tariff (CEPT) plan, designed to gradually reduce import duties on all manufactured goods until the AFTA tariff targets of zero to five percent would be reached. Initially, the target completion of the ASEAN Free Trade Area was set at the year 2008, fifteen years after the signing of the Singapore Declaration. However, with the conclusion of the Uruguay Round of the GATT, and the gaining momentum of APEC as a trade liberalizing force, the ASEAN Economic Ministers (AEM) agreed in September 1994 to further accelerate the implementation of AFTA to ten years (i.e. year 2003). This underscores ASEAN's intent to make AFTA the principal vehicle for the liberalization of trade within the region.

The basic instrument to implement AFTA is the Common Effective Preferential Tariff (CEPT). In conformity with CEPT, member countries can opt for a normal track or a fast track reduction plan. In the fast track reduction, a 0-5% import duty must be reached by the year 2000, for items with import tariffs lower than 20% and before 2003 for items with import tariffs higher than 20%. Import tariffs on products categorized as normal track are to be reduced over a time span of 10 years. Member countries are allowed, however, to delay tariff reduction on some goods, by including them in a special "exclusion list". When that occurs, the country placing that product on the exclusion list would not receive special tariff preferences (on that product) from other ASEAN countries. Each ASEAN country is also free to set its own level of tariffs on imports from non-ASEAN members [12].

The Thai fast track tariff reduction scheme for PVC and VCM products has been criticised by the Thai petrochemical and plastic manufacturers. As the fast track tariff reductions would lead to the abandonment of the 10 year protection, which the government had promised before by the imposition of 40% import duties on plastic powder and 20% on raw materials, such as ethylene and propylene, the industry has asked the government to postpone its application for at least 5 years. In addition, the proposal to include plastics and petrochemical products in the fast track had reportedly been unilaterally made by the Thai Ministers of Finance[11], the Thai authority negotiating the duty reduction at the AEM, without consultation with the Ministry of Industry. Although Indonesia and Malaysia made reservations about putting plastics and petrochemicals in the fast track, Thailand still wanted to go ahead, thus putting domestic petrochemical industry producers at a disadvantage compared to their competitors in ASEAN. Another complaint from the industry sector was that an immediate reduction of 10% was too large.

A source at Vinythai explained: "For the whole petrochemical industry it is difficult to survive at the moment without the protection given by the 35% import duty as this was the absorption rate for the higher raw materials costs in Thailand, but for Vinythai it is particularly difficult as we just have made - with some delay unfortunately - a major investment worth about 230 million US dollars, in the VCM and chlor-alkali plants. If Vinythai had not had to delay the start of the second phase of the project, the negative effects of tariff reduction would have hurt the business less as it would have had more time to improve its financial situation after the heavy investment burden." From this, it also can be concluded that TPC was less affected by the duty reduction than Vinythai.

[11] The Minister of Finance at that time was Khun Tarrin Nimmanhaeminda.

The PVC market was greatly affected and the implications of this decision could be felt from its announcement onwards - some months before the reduction became effective - as all PVC finished product manufacturers stopped making orders in the first two months of 1995 in order to liquidate inventories as much as possible and to start filling these up again after the prices were reduced.

TOC (the producer of ethylene) was most affected by the duty reduction. Having been forced to become shareholder and having concluded a fixed price supply agreement with TOC, Vinythai had its share of the burden. The price of ethylene supplied by TOC was 100 USD per ton higher than the imported ethylene, but as TOC was making losses, its creditors did not allow price reductions. Vinythai's profit margin was narrowed further, because of a slower drop of the price per kg for VCM (5%) than for PVC (7%), after the implementation of the reduction of the tariffs.

However, AFTA will also have long-term beneficial effects on Thailand's petrochemical industry. In 1995, Thailand had the largest PVC production capacity in ASEAN countries and it was expected that the exports to ASEAN countries would expand as a result of AFTA, as the production capacity within ASEAN countries was not sufficient to meet internal demand. The only country with production capacity for export was Singapore. This would lead to a good export opportunity for domestic PVC manufacturers. On the other hand, Thailand was wary that with CEPT, non-ASEAN petrochemical manufacturers like Japan, South Korea, Taiwan and Saudi Arabia, would use Singapore as a re-export base for their plastic pellets for the purpose of dumping on the Thai market, as it is very difficult to determine the origin of the contents of plastic pellets despite the AFTA rules of origin. In a longer run, it is expected that Thailand's main competitors will be Malaysia, Indonesia and Vietnam. This is because these three countries have more oil and natural gas reserves than Thailand. They also have plans to develop the industry [13].

As globalisation and free trade within AFTA requires adjustment of local industries to become competitive in the world market, the government has introduced new policies[12] in May 1995, which further liberalised the industry [5, p.12]. Contrary to its directive and supportive role in the past, the Thai government has become rather an observer of developments.

Following the Ministry of Industry guidelines of May 1995 set up to further liberalise the petrochemical industry in Thailand, all major market players launched expansion plans, vertical mergers, or both. Between April and June 1995, the BOI approved petrochemical projects submitted by 19 companies, among which TPC's investment of 3,407 MBHT for VCM production capacity expansion of 300,000 TPY. The BOI also approved the investment in a PVC resin production capacity of 100,000 TPY by a newcomer, the Apex Plastic Group, a Japanese-Thai joint venture. Apex Plastics is a PVC sheet producer and was a customer of both Vinythai and TPC, before deciding to vertically integrate into PVC

[12] Any petrochemical company will be able to expand or invest in the production of any petrochemical product except upstream aromatic products (until May, 2003). Upstream companies are now permitted to expand or invest in the production of feed stock for their own use, for use in petrochemical plants, or for exports. However, their by-products must not be sold, as fuels, on the local market, unless specifically authorised by the National Energy Policy Council. Finally, the petrochemical products and feed stock should be priced according to world market prices.

production[13]. The Apex Plastic PVC plant is to serve both its existing PVC sheet plant, as well as a second plant with a capacity of 600-800 tons per month (TPM) and it intends also to partly dedicate the production to export markets [1, p 45]. Commercialisation started in 1997. According to a source at Vinythai: “Apex is not considered a real competitor, as its financial back-up is weak and as it has to import the raw material of which the price is quoted in USD. In addition, Apex’s output is expected to replace the country’s imported PVC volume, rather than steal market share from existing producers”.

## 6.4 Strategic reactions of Vinythai and TPC

(a) In spite of the changes in the external environment, but with due regard of the increasing export volume of PVC from Thailand, TPC further expanded its production capacity for PVC. Moreover, in order to create production stability for PVC, the company received BOI approval in the first half of 1995 for its project to expand VCM production at the Rayong plant, with expected production and commercialisation start-up by the end of 1997, and with an annual production capacity of 300,000 TPY.

In order to finance the expansion of the PVC and VCM plants, TPC increased its Registered Capital from Baht 500 million to Baht 870 million in 1995.

Furthermore, in an effort to weather the difficult circumstances brought about by uncontrollable factors, TPC concentrated on improving the production efficiency and on expanding the export market, with emphasis on neighbouring countries in the region. In the fiscal year 1995, exports expanded by 110% from the previous year.

In an attempt to prepare for Vinythai’s new VCM project, TPC sold 10 percent of its shares to Siam Cement Plc. and signed an agreement with that company to establish a new PVC producing business in Surabaya, Indonesia, with a capacity of 120,000 MTPY. The new company, to be called “PT Siam Maspion Co.”, will produce and distribute PVC for the local market and for export. It has a registered capital of 50 million USD. TPC and Siam Cement together will hold a 50% stake, while the Indonesian partner, Maspion Group, will have the remaining half of the equity capital. Production in Indonesia was expected to start in late 1998 [14].

Furthermore TPC planned a production expansion of 82,700 MTPY of EDC and 300,000 MTPY of VCM. Products from both projects are to replace imports, thus achieving more security in supplies and a lessening of the risk of cost fluctuation of raw materials. The start of production was expected by late 1997. In addition, TPC also started exporting PVC products to Vietnam and started the construction of a PVC plant in Vietnam. Finally, TPC decided to jointly invest in Rayong Olefin Company Ltd. with a group of companies in the petrochemical industry to produce ethylene as main product. The objective of the project is to ensure competitive supply of ethylene to the VCM plants. The start of production was expected in late 1998.

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[13] It can be observed that customers of PVC usually order from all available sources in order to ensure the avail-

TPC's reaction proved to be successful: for the fiscal year 1995, TPC was able to increase its sales volume by 21% (despite some decline in demand in the PVC industry) and its market share by 10% compared to the previous year.

(b) The management of Vinythai, directed by the new MD, Mr. J.P. Puskas, launched mid-1996 a strategic action plan in order to prepare Vinythai for the global market. The main aims were as follows:

- to minimize the investment costs for capacity expansion;
- to minimize the manufacturing costs through competitive feed stocks and utilities, reduced fixed costs by employing a higher integrating process with an efficient technology;
- to save on distribution cost by being close to the customers.

The elements included in Vinythai's cost reduction action plan are the following [15]:

***Lobbying***

The adjustment to cope with competition from abroad will need various supporting measures from the government, such as adjustment of prices of raw materials to reflect prices abroad (especially in the US, the Middle East and in Europe), reduction of import tariffs for machinery and further protection in the early stages of operation as investment in this industry is quite substantial. Therefore, the Federation of Thai Industries' Petrochemical Industry Club lobbied fiercely with:

- The Ministry of Finance: for postponement of the implementation of duties reduction and for a waiver of the withholding tax on foreign borrowings [16].
- The Ministry of Industry: for adjustment of prices of raw materials, as electricity is supplied solely by the state-owned EGAT and natural gas solely by the state-owned PTT. The cost level of electricity is quite comparable to the level in Indonesia and Malaysia, but relatively high compared to the USA and even Europe. The same applies to salt. The trend in Thailand was catastrophic, not only for Vinythai, but for the complete petrochemical industry : e.g., the cost of natural gas had been increasing by more than 50% in three years time, the electricity cost by 70% and raw water by 70% as well.
- The BOI: for using its authority to impose a special surcharge of for instance 20 or 25%.

Opting for the latter solution (BOI) would look very bad on Thailand, however, and would contrary the Thai commitment made as WTO member. The postponement of tax reduction is legal and much simpler. Initially, the Ministry of Finance refused to do that, however, because they wanted to keep the promises under AFTA.

As it seemed that there was a lack of commitment from the Thai side to tackle the problem, Vinythai's Managing Director, Mr. Pavlich, was followed up in Summer 1996 by the more experienced Jean-Pierre Puskas[14], as he had been in charge of the world-wide PVC business of Solvay for four years

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ability of the goods in the event that any supplier of PVC is unable to supply PVC on time.

[14] Mr. Puskas was born in Belgium. He studied chemical engineering at Mons Polytechnic School, Belgium and business at the Solvay Business School. During his entire career, he has worked for Solvay, where he obtained experience in different fields. He started at the Research Center-Solvay Belgium, then moved on to the Plastic Processing Sector-Solvay Belgium, and later to the Financial Department-Solvay Belgium. After that, he became

before becoming the Managing Director of Vinythai. One of his tasks was to explain to the government the difficulties of the plastic markets with its volatile movements and how Thailand can benefit from increased competitiveness in the petrochemical industry: Vinythai's electrolysis and chlorine unit and VCM operation, which commenced operations in July 1996, helped improve the country's trade balance by 3.4 billion Baht per annum, through the scrapping of VCM imports.

Eventually, this lobbying has been more successful, as two times a six month postponement of duty reduction on PVC imports from 27% to 20% until the end of 1997 has been obtained[15].

***Further measures to reduce costs***

Mr. Puskas revised logistics (re-negotiation of transport contracts, suppression of the external warehouses to optimise inventory levels) and utility contracts with suppliers (re-negotiation of ethylene and electricity contracts for better conditions of supply), substituted natural gas by a cheaper tail gas, closed down external caustic soda tanks, progressively improved the productivity of the staff, maximised production capacities towards exports to reduce unit costs, and optimised consumption and production of raw materials and outputs by introducing highly automated processes and highly performing technologies.

***Measures to increase revenue***

In order to improve the company's margins, also two secondary products, namely hydrogen – which is a co-product of caustic soda - and sodium hypochlorite – which is linked to the production of chlorine - were marketed more and more significantly. Finally, in 1996, Vinythai launched an export policy of diversifying the customers base abroad. It resulted in an increase in export destinations from 9 countries in 1996 to 18 countries in 1997.

***Improving internal communication***

Internally, Mr. Puskas concentrated mainly on informing shareholders and members of the Board on the market changes and on required strategic reactions, in order to have a good mutual understanding and support. The Board meetings which took place every 3 months according to Thai law were not considered frequent enough, taking into account the frequent changes in the external environment. An Executive Committee was created, that meets once a month and that is attended by members of the Board of Solvay and CP.

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General Manager of Solvay's subsidiary in Spain, Tureplastic and Tubos Saenger, and International Business Manager of VCM & PVC at Solvay Belgium, before becoming the Managing Director of Vinythai in Thailand.

[15] In 1997, the import duty on EDC and VCM was 5% (coming from 20% before the start of CEPT). Malaysia, which is practically not producing PVC, applies a lower import duty on PVC of 10%. Indonesia, however, is producing PVC and protects its production behind an import duty on PVC of 20% (see table 2 and 3 in annex 1**).** The reduction in Thailand has not been further postponed after 1997, as this is somehow against the world trade policy.

***Fully integrating the production process and increasing production capacity***

Although Vinythai has no intention to move into the upstream petrochemical activities, which are outside the core business of Solvay, it engaged in indirect upstream integration by taking shares in its ethylene supplier (TOC), in order to ensure the ethylene supply.

According to Mr. Puskas: ”Based on the experience of Solvay, being a big purchaser of ethylene, we noticed that it is generally more interesting to purchase the ethylene than to produce it yourself, taking into account for instance the small ROI observed by the ethylene producers for the last fifteen years. Here, it is probably a different matter, but I think it is not in the core business of Solvay. So, Solvay prefers to concentrate on its own core products. The only upstream integration Vinythai has opted for is the electrolysis plant for the production of caustic soda and chlorine, and its shares in the salt company. Vinythai had been obliged to take some shares in the cracker as well, though, in order to secure its supply of ethylene, although it was not convinced of the cracker's profitability perspectives. For vertically integrating in your own cracker you need to be an oil company, otherwise you don't have a competitive advantage to do so. You have to purchase your naphtha at market price, which is not so obvious".

***Reorganising the company***

The high number of expatriates during the initial phase of operation were gradually replaced by locals after a long training and Mr. Puskas is accelerating this process whenever technically feasible (process, safety, environment and training of the Thai staff).

The new Managing Director decided that not only on plant level people should be trained, but also future managers are sent now to Solvay companies in Europe to experience the technical and organisational culture. He also wanted the organisation to be smaller and flatter, reducing the number of staff significantly from 560 at the end of 1995 to 490, despite commissioning of the company's new production unit. This did not cause conflict with the Thai culture of not-laying off people. Mr. Puskas explains: "Most of the people that left, did so because they were offered a higher salary elsewhere (there is a high rotation rate in the sector of about 12-13 %). And each time, we looked whether that person needed to be replaced, or whether the company could be reorganised in order to reduce the total number of employees. As a consequence, in one year and a half, the number of employees was practically reduced by 15% without ever announcing any lay-off. So, it happened rather softly and with collaboration of everybody, which is needed each time you reorganise the company. In addition to that, Vinythai also had more than 40 expatriates for the start-up of phase II, after which most of them (35-36) left the company again".

***Increasing capital***

In 1996, shortly before Mr. Puskas's arrival, Vinythai has increased its capital from 3 billion Baht to 6 billion Baht[16]: A total of 301.2 million new shares were offered to current shareholders, who received

[16] Approved by the shareholders on March 29, 1996

one new share for 10 Baht, the par value, for every share held. Ten % was brought in by the public and 90% by CP and Solvay together.

***Improving quality***

This strategic move resulted in Vinythai obtaining the ISO 9002 certificate for PVC at mid-1997 and for caustic soda at mid-1998. The ISO 14001 Certification Project for environment protection is now on-going with the purpose to get the ISO 14001 Certification at mid-1999.

***Product and process development***

This policy led e.g. in 1997 to the development of various process improvements, increasing the production capacity for PVC, especially in suspension, such as a higher activity catalytic system and an enhanced control of the condensers. Meanwhile, the electrolysis and VCM plants have also been the subject of various internal developments.

In terms of product quality, the development of new grades of PVC for both suspension and paste resins has been continued to satisfy the requirement of additional markets, such as the medical grade supply and paste for the toy industry.

## 6.5 Results

These measures helped reduce Vinythai's operating costs by 250-300 million Baht annually. This has, together with the integrated production process since July 1996, resulted in positive cash flow before interest and tax. Vinythai's gross margin improved dramatically to 29 percent in the first quarter of 1997 compared to only 5% in the same quarter the previous year. This was also partly due to improved prices of VCM and PVC on the world markets.

## 6.6 Remaining problems

### 6.6.1 High costs of utilities and raw materials, and higher wages

The largest problem that the industry faces is the high costs of utilities and raw materials and the reduced competitiveness of the Thai petrochemical industry compared with ten years ago, when the initial feasibility study for investment in Asia was made by Solvay.

Raw materials for the petrochemical industry in Thailand cost significantly more than the average price of world competitors.
During the past four years, the gas price in the country (indexed on the monopoly state owned PTT prices) has jumped by more than 40 percent and is four times higher than in the USA and also much higher than in Indonesia and Malaysia; raw water has increased by 70 percent and electricity costs (monopoly by state-owned EGAT) by 24 percent. Electricity to make one kilogram of plastic before the outbreak of the Asian crisis, costed only 0.75 - 0.80 Baht in Indonesia compared with 1.80 - 2.50 Baht

in Thailand. The ethylene price provided by Thai Olefins (TOC), is higher than the world price because of the losses TOC is making. The TOC ethylene prices are around 15 percent higher than the US Gulf Coast price. Finally, also the salt price is six times higher than in other countries that are major producers.

However, a 400 km oil pipe has been constructed between Indonesia and Thailand and joint exploration of gas by Malaysia and Thailand in disputed territory was announced in the beginning of 1998.

In addition, wages in the Indonesian plastics industry, a major rival of Thailand's, were only 55 Baht per day, compared with a minimum daily pay of 156 Baht to apply in Thailand from October 1996 onwards.

Therefore, producers of plastic products (e.g. producers of toys and kitchenware) shifted to Thailand's neighbouring countries where wages were lower and where more advanced equipment was in use. This resulted in a decreased local demand for PVC.

Further problems included the difficulty of finding highly skilled labour in Thailand, with good professional experience and sufficient proficiency in English, and the large rate of job rotation as a result of a low loyalty to the company. As for Vinythai, competitors in the sector succeeded in attracting some of the Solvay-trained engineers by offering higher wages or higher positions. Other workers have left the company and moved to more secure sectors, because of the overall problems in the petrochemical sector, thus causing a shortage of engineers in the petrochemical sector, which in turn lead to a sharp increase in salaries of 15-20% per year. As a result, the gap between unskilled an skilled labour in Thailand became 1:15, compared with a 1:3 ratio in Europe. With the devaluation of the Baht (see below), skilled labour costs have reduced to more acceptable levels.

### 6.6.2 Threatening unfair competition

Thai firms are facing unfair competition from Malaysia and Indonesia, which failed to reduce their tariffs. In addition, some ASEAN countries, such as Malaysia and Indonesia, have extended concessional loans to their petrochemical producers at interest rates of as low as 4 percent [17], compared to 15.5% in Thailand before the devaluation of the Baht in July 1997.

Finally, there is also the risk of Thai producers becoming confronted with dumping. When the petrochemical industry faced its last downturn at the beginning of the 1990s, large quantities of raw materials, produced mainly in the Middle East and South Korea, were allegedly dumped in Thailand via Singapore (through re-labeling and re-packaging).

The problem is still threatening the Thai petrochemical industry, and no valid solution to solve the problem has been found yet. The new AFTA regulations imposing stringent rules concerning the certification of origin, should provide a better protection against dumping. Nevertheless, the market players feel that more severe and inflexible controls should be imposed, as well as the possibility of a countervailing duty on dumped products. The problem of dumping even aggravated with the start of the finan-

cial turmoil in Asia in mid-1997, as exporters are competing to acquire USD to make their loan repayments. Therefore, the Thai Commerce Ministry was asked to speed up a draft of a market dumping bill to Parliament [18] and several measures are taken to ease the cash-flow problems for exporters in Thailand.

## 7. The Asian financial crisis

The financial crisis in Asia, precipitated by the floating of the Baht exchange rate on June 2, 1997, and the resulting severe liquidity problems, caused many companies in Thailand to suffer heavy exchange losses and shortage of working capital. This caused bankruptcies. PVC supply in Thailand is higher than demand, putting downward pressure on profits, and also the export markets prove to be highly competitive, since the producers in other Asian countries are experiencing the same problems as in Thailand.

Because of the floatation of the Baht, Vinythai has sustained in 1997 exchange losses of Baht 5,610 million. This loss is mostly (98%) unrealized, as the Company has a secured long term financing package under which the loans are to be repaid over the following nine years, spreading the impact over time. It is presumed that the loss will not affect the firm's financial stability, as it has a strong debt to equity ratio (1.54:1 or 2.33:1 after the devaluation, compared to the average ratio of 2:1 for listed companies). Instead, Vinythai's cash flow and margins are expected to improve, because its products and ethylene raw materials are based on the international market price, which are mainly fixed in USD, while electricity and gas prices are not. It is expected that Vinythai's financial stability will improve. In addition, the export market is targeted more aggressively [19].

TPC is not so much affected by the Asian crisis either, as its foreign exposure is rather limited. However, its ambitious investment program in Thailand, Vietnam and Indonesia will deteriorate its financial position. The export target doubled and the opening up of new export markets is prioritised. In order to support its export initiatives, TPC planned to open two new overseas branch offices: one in China and another one in West Asia.

It can be observed that some of the non-integrated PVC producers relying on imported VCM and/or EDC (which are quoted in USD), such as Apex, became in trouble to get the necessary credit to purchase their imported raw materials and were obliged to reduce or suspend their operations. As Apex was squeezed in its margins with depressed selling prices in the domestic and export markets and higher raw material costs to be paid in USD, it decided to suspend its operation in October 1997.

How weak PVC prices will become will depend on what happens with the PVC markets in Asia, but it is probable that the PVC Far-East prices should recover depending on the EDC and VCM prices and the supply-demand balance in the region. The Japanese, Taiwanese and Korean PVC producers, which are the biggest PVC suppliers in Asia, are heavily depending on imported EDC from the USA and the Middle East. Consequently, it will be difficult for them (and particularly the Japanese and Taiwanese) to compete on a shrunk export market against a totally integrated PVC producer like Vinythai.

Being totally backwards integrated in chlorine, EDC and VCM, Vinythai has demonstrated in 1997, its ability to resist an extremely hard competition and to improve constantly its performance and competitiveness in a market that is becoming more and more global. But there are doubts about the future involvement of CP in Vinythai: “The regional meltdown has shaken even CP. After diversifying from agriculture into petrochemicals, retailing and telecommunications, Mr. Dhanin, the Chairman of CP, said the group was going back to its agribusiness roots. Telecommunications is one of the two core business Mr. Dhanin wants to keep, aside from agribusiness. He is ready to sell anything else, ranging from retailing to petrochemicals, if prices are attractive enough” [20].

## 8. Performance of Vinythai

Since Christmas 1992, the plant achieved the maximum designed full production capacity of 115,000 TPY of PVC, ahead of its original schedule (first quarter of 1993), and its targeted market share of 35 %. Still, the results of Vinythai’s operation were not significant to the overall anticipated profitability for the following reasons: production of PVC had reached a significant level only at the end of 1993 and the spread between the price of PVC and VCM, which had reached a historical law in mid-1993.

In 1994, Vinythai could announce the first profits. The company achieved a net profit of 225 million Baht (compared with a 438 MBHT loss in 1993), out of a total income of 3,679 MBHT (95% higher than that of 1993). Vinythai was also able to achieve a 36% increase in sales, as against 1993. Moreover, the company’s PVC production in the last quarter of 1994 was far beyond the name plate production capacity by as much as 13%.

This result was mainly due to the fact that in 1994, the Thai economy and the demand for PVC had continuously grown satisfactorily, particularly the demand for PVC, which accounted for 29% of total demand for plastics. Plastic resins has regained according to global economic recovery, resulting in a high price of PVC throughout 1994 and has made the spread between the price of PVC and VCM to increase since the first quarter of 1994. However, part of this result came from the depreciation of the US dollar against the Thai Baht, thus re-valueing Vinythai’s US dollars indebtedness, which produced an unrealised foreign exchange gain. This gain was related to an indebtedness on which the first repayment was not due until 1996. However, the depreciation of the US dollar had directly affected the selling price of Vinythai’s product as worldwide prices of PVC are fixed in US dollars. Although this mitigated Vinythai’s global exposure to foreign exchange risk from an operational point of view, accounting presentation gave a different impression.

In 1995, however, the average VCM purchase price increased versus the PVC selling price, due to the delivery gap of approximately three months of the VCM versus the PVC. Vinythai’s PVC selling price closely followed the market price (see figure 2), while its VCM purchase price was delayed by three months versus the market price (see figure 3), causing the Vinythai PVC-VCM spread to be quite different versus the market spread (see figure 4). As a result, Vinythai suffered a dramatic drop in margin and experienced its largest losses ever (1.2 billion Baht) as the increase in income (0.18% increase from 3,472.1 MTHB in 1994) had not been enough to repercute the increase in cost of sales. This abnormal situation stemmed in particular from the need of Vinythai to commit its VCM purchase three

months in advance, thus making it impossible to quickly adjust to the sharp decline of PVC prices observed in the third quarter of 1995. This was a clear demonstration of the risk of non-integration in a very volatile market.

**Figure 2: Comparison PVC market price - Vinythai**

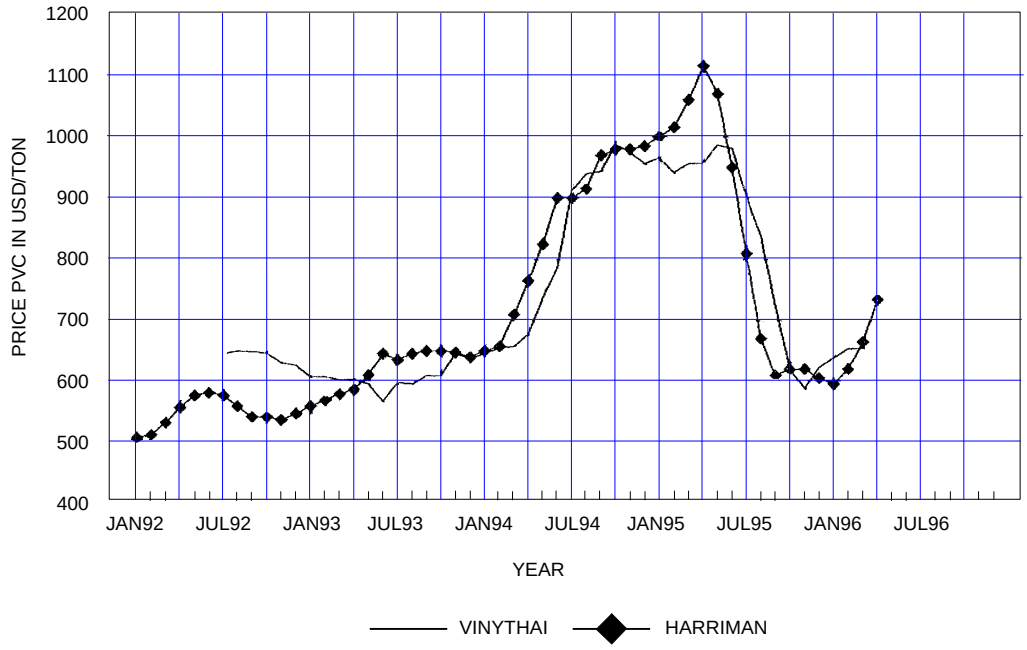



**Figure 3: Comparison VCM market price – Vinythai**

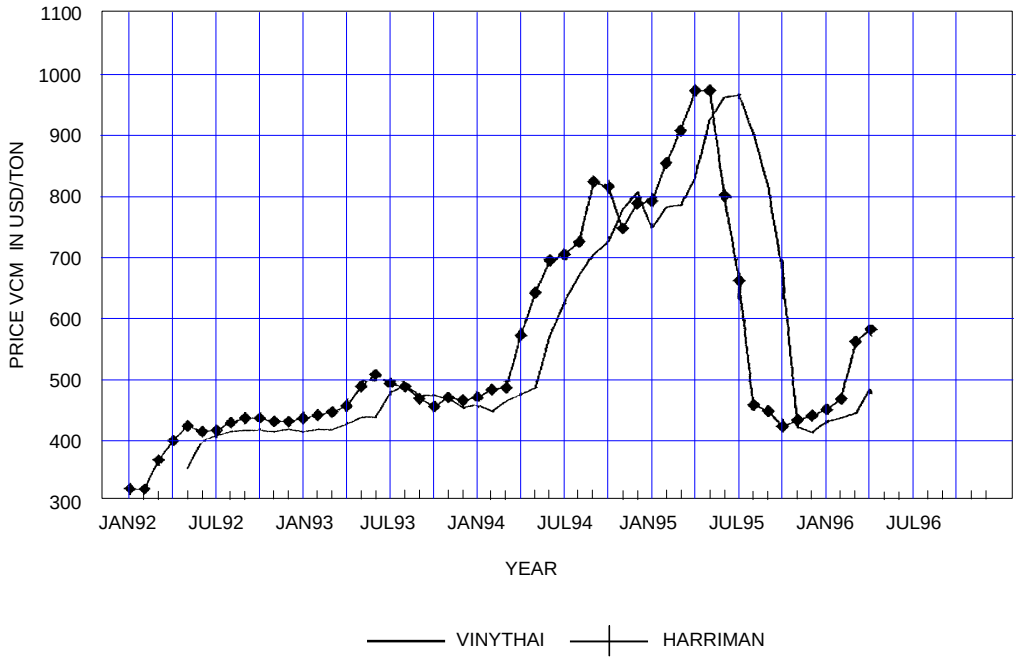
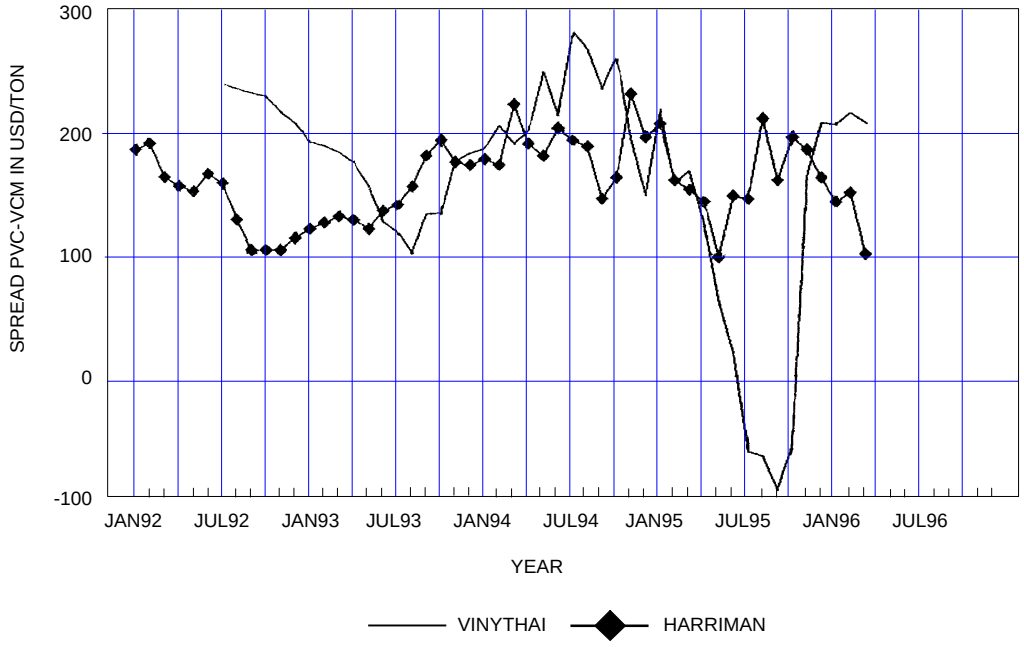


**Figure 4: Comparison PVC-VCM market spread - Vinythai**




Despite the negative effect against the PVC market throughout the year 1995 and a reduction in production of 12% from 1994 (much lower than the effective production capacity of about 140,000 TPY), Vinythai's sales had increased by 2.9% compared to 1994, whereby PVC sales amounted to 89.9% of the total sales in 1995. Volume increased by 0.6%

The situation improved progressively during the fourth quarter in 1995 and sharply in 1996, but the company still lost 309 million Baht in 1996 and 107 million Baht in the first quarter of 1997, due to the very depressed selling price of PVC and caustic soda and the sharp increase of the ethylene price.

After the Bank of Thailand had introduced a floating currency system on July 1997, Vinythai has covered when appropriate and when available the interest payments and principal repayments in US dollars, due to be paid within 6 months, which explains the unrealized FOREX gains of 61 million Bath in 1997.

However, due to this change of Thailand's foreign exchange system and the Baht depreciation, Vinythai has sustained exchange losses of 5,610 million Baht (of which 98% are unrealized). Therefore, the net loss for 1997 was 5,391 million Baht. The unrealized portion of this extraordinary item does not affect the company's cash flow. Furthermore, since Vinythai's selling prices relate to the international selling price, which is referenced in US dollar, Vinythai's turnover will also be influenced by the fluctuation in the exchange rate and this will offset mainly the impact on its future debt service.

The financial crisis that affected most of the Southeast Asian countries in the second half of 1997, made clear that the company's decision to fully integrate the plant was the right strategy. As the company is no longer relying on imported raw materials, the 1997 depreciation of the Baht, together with the cost reduction plan of 1996 that was pursued in 1997 and 1998, also boosted its overall competitiveness.

Sales of the company in 1997 were 34% higher than in 1996. The Chlor-Alkali and VCM plants were started up in the second quarter of 1996; therefore, 1997 was the first complete year in operation of the fully integrated PVC plant. This allowed Vinythai to run its plant more effectively and to increase, in 1997, the quantities sold of PVC and caustic soda by 15% and 59% respectively compared with 1996.

The gross margin went on improving quarter after quarter in 1997 to reach 42% of the sales in the last quarter. On average, the 1997 gross margin was equivalent to 35.2% of the sales compared with 19.7% in 1996. This was the result of a strong improvement of Vinythai's competitiveness following the cost reduction plan launched since mid 1996, together with the devaluation of the Baht.

Vinythai hopes to obtain the minimum required return on investment (ROI) of 15% by the year 2001 (see Box 4).

**Box 4:**
**Vinythai's expected ROI**

"The performance of an industrial company has to be assessed on a LT-basis (10 years) as economy of scale has to be built up progressively: the beginning phase of the industry has to be protected during enough time to make sufficient cash flow to make the necessary investment in order to reach that critical size so that it can compete on the global market. Measure of performance is ROI on LT-basis. Minimal ROI should be about 15%. Vinythai will probably obtain this 15% ROI in the next five years only" (Puskas, 3 March, 1997).

In 1997, before the floatation of the Baht, Vinythai had captured 37% of the market, with TPC holding 51% and importers 12% of the market. Taking into account that TPC has been in the market much longer, this proves that the company has been highly successful in a short time period by rapidly increasing its market share. This is obtained by its competitive price, technology, quality of products and services. In order to maintain an equilibrium on the market, Vinythai has decided to maintain this local market share and not to try to obtain more, but instead increase exports to surrounding countries in order to plenty its capacity.

During the period after the depreciation of the Baht, practically all imports have disappeared in Thailand. In addition, it is cheaper for the converters to use domestic supply, as the price of the local producers was, during those months, below the international price. Consequently, there is room for increasing exports, the more so as in 1998, the domestic PVC market is expected to shrink down by more than 10% due to the turmoil affecting the region.

## 9. Conclusions

In this case study on Vinythai, a joint venture in Thailand between the Belgian company Solvay and the Thai CP Group, we have focused on the impact of rapid changes in the external environment on the company's strategies. Although Vinythai was established in December 1988, production was started only in July 1992. By that time the company was confronted with a different situation at the

world market for its end-product (PVC: polyvinylchloride) and its raw materials (among which VCM: vinylchloride monomer). The world market for PVC was depressed and prices on the local market low. Moreover, pending the completion of its integrated project, which would entail its own VCM production, Vinythai had to import this product at prices increased by high tariff duties.

The entry of Vinythai in the Thai market caused a cut-throat competition with TPC, the former monopolist which was able to supply at a low price, because of lower financial costs and large production capacity. Vinythai's strategy was instead to develop its competitive advantage based on quality, variety and service. Vinythai's market share in Thailand grew quickly, which in turn made TPC increase both production capacity and variety of its products. Technological mastering of the new grades to be offered by TPC was acquired by establishing a joint venture with a large US producer of PVC emulsion.

Vinythai continued the implementation of the second phase of its integrated project. During the third quarter of 1996, two additional production units became operational. One unit produced the chlorine to be used in PVC production, as well as the by-product caustic soda. Excess supply of caustic soda on the Thai market was avoided by exporting through Solvay. In order to have access to secure supplies of salt, the raw material for chlorine production, Vinythai took a stake in a salt refining company and concluded a strategic partnership agreement. The other unit produced VCM. Raw materials for the VCM production are supplied by Thai Olefins Company, in which it has acquired shares, on the basis of a long term sales agreement. Vinythai's original strategy of integrated production seemed to be a burden, as the price of imported VCM was lower than Vinythai's production cost for the same product.

Vinythai remained confronted with other dramatic changes in the external environment. One was reduced competitiveness in the world market, to a large extent due to the high exchange rate, which is linked to an appreciating dollar, and to increasing wages in the petrochemical industry. Another change was the announcement by the Thai government to reduce the protection of PVC and other petrochemical products, as a consequence of commitments made under the ASEAN Free Trade Agreement (AFTA), the Uruguay Round and during the APEC talks. This announcement of liberalisation shook the Thai petrochemical industry. As Vinythai heavily depended on the local market for its supplies of raw materials, its competitiveness ran the risk of being eroded away completely. TPC's reaction was to increase production capacity further, in order to produce cheaper and more efficiently, particularly for the export market. Vinythai's reaction concentrated to a large extent also on increasing production capacity and higher production efficiency. In addition, much attention was devoted to internal communication and restructuring, as well as improving quality and further product and process development. Together with the other petrochemical companies, Vinythai, through its Managing Director, was also lobbying actively and until the end of 1997 successfully, with the Thai government for postponement of the announced tariff reductions and for adjustment of the prices of natural gas and electricity. After that, no further duty reduction postponements have been allowed for petrochemicals.

Then came the catastrophic turmoil in Asia, triggered by Thailand's devaluation of the Baht on July 2, 1997. Overnight, Thailand's foreign debt burden increased dramatically. As a result of the devaluation of the Baht, also Vinythai had to face foreign exchange losses. However, as Vinythai's foreign debts

have 10 year maturity, these losses are spread over this period. On the other hand, Vinythai's competitiveness on the foreign markets has increased, but so is TPC's. Moreover, TPC has a limited foreign debt exposure. Against this, we should mention Vinythai's backwards integrated production and its resulting relatively low dependence on foreign supplies, which seems to be paying off now. Another threat is looming, however, as the CP Group, one of Vinythai's parents, has announced to reconsider its former strategy of diversification away from agrobusiness.

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- Interview with the Managing Director of Vinythai, 3 march 1997.
- Interview with the consultant to the Solvay S.A. Group and Director and Executive Director Vinythai, 29 August 1997.
- Interview with the Managing Director of Vinythai 12 November 1997.
- Interview with a former Administrative Board and Executive Committee Member Solvay (retired now), 20 February 1998.
- Written communication by the Vice President Finance and Administration Solvay Asia Pacific in Singapore, 24 April 1998.
- Oral communication by the Vice President Finance and Administration Vinythai, May 1998.
- Oral communication by the Managing Director of TPC, May 1998.

**Secondarily data**

Annual Reports TPC 1992 – 1997 and Annual Reports Vinythai 1994 -1997
http://www.Oxychem/html.

**List of abbreviations used in the case study**

**Organisations**

| | |
|---|---|
| ASEAN | Association of South East Asian Nations |
| BOI | Board of Investment |
| CP | Charoen Pokphand Group |
| ICF | International Finance Corporation |
| NPC | National Petrochemical Complex |
| TOC | Thai Olefins Company Ltd. |
| TPC | Thai Plastics and Chemical Plc. |
| TPE | Thai Polyethylene Co. Ltd. |
| TPI | Thai Petrochemical Industry Public Co. Ltd. |

**Petrochemicals**

| | |
|---|---|
| EDC | Ethylene Dichloride |
| HDPE | High Density Polyethylene, a plastic resin composed of atoms of carbon and hydrogen |
| PE | Polyethylene |
| PP | Poly Propylene, a plastic resin composed of atoms of carbon and hydrogen |
| PTA | Pure Terephhalic Acid |
| PVC | Poly Vinyl Chloride |
| VCM | Vinyl Chloride Monomer |

# Annex 1

# Description of the products and the production process

PVC is categorised as a hydrocarbon made up of vinyl chloride monomer (VCM), which is processed from the primary raw materials of salt, electricity and ethylene as follows:

1. The most basic raw materials supplied by the (upstream) petroleum refineries or natural gas companies are LPG, natural gas, naphtha, liquid distillate, distillate from special cracking processes, and selected or isomerised cyclic fractions for aromatic. These undergo a first transformation into monomers such as ethylene and propylene (which are categorised as olefins);
2. purified salt is dissolved in water and electrolysed and gives chlorine and caustic soda;
3. ethylene and chlorine are reacted to produce ethylene dichloride (EDC);
4. this then moves onto a cracking process that yields VCM, a primary raw material for PVC (intermediate);
5. VCM undergoes polymerisation into PVC (downstream);
6. this then becomes raw material for production of plastics and synthetics for further industrial use.

PVC can be divided into 2 categories:

1. PVC suspension, which appears in powder form. When processed, it is strong, durable and has a long life. PVC suspension is used primarily in manufacturing goods such as water pipes, electric wire insulation, tubes, films and sheets, water bottles, records and document folders, etc.
2. PVC emulsion, which generally appears in powder form. When it is processed, PVC emulsion is tough and elastic. It is used for the production of floor tiles, leather coating material, artificial leather, sheets, car accessories (dashboard, door seats), toys.

Its general qualities are resistance, durability and high flexibility and is as such replacing more and more traditional materials.

The by-product, caustic soda (also called sodium hydroxide), can be divided in solution form (92% of the users) and flake form (8 percent of the users). The solution form is used in industries such as the confectionery manufacturing industry, vegetable oil, chemical solution, textile, mono sodium glutamate, detergent, paper, etc. It can be produced either by causticising soda ash, or by the process of electrolysing. In view of its scope for diversification, electrolysis gradually came to replace the causticisation units.

Soda ash (also called sodium carbonate) is an alkali produced from common salt, amonia, carbon dioxide (CO2) and lime. Soda ash and derivatives are used in the composition of glass, detergents and plastics and in the purification of industrial emissions, neutralisation of acidity in water, and the manufacture of medicines and foodstuffs.

High Density Polyethylene (HDPE) is a polymeric synthetic resin made by the polymerisation of ethylene. Due to its toughness and high impact strength, it is used to produce endurable products, such as plastic rope, fishing nets, oil tanks, containers and bags for hot food.

Naphtha is one of several liquids made from petroleum or coal tar. It is used in cleaning fluid, fuel mixtures and solvents, as well as rubber paints and varnishes.

Polypropylene (PP) is a polymerised propylene. It is a very light, highly resistant, endurable, thermoplastic resin, used to produce plastic nets, fertiliser bags, mats, batteries, toys, kitchenware, office equipment, cables.

# Annex 2

**Table 1: Structure of Import Tariffs and discount rate of PVC in ASEAN in 1990**(per cent)

| Thailand | | Indonesia | | Malaysia | | Philippines | |
|---|---|---|---|---|---|---|---|
| Normal | Discount | Normal | Discount | Normal | Discount | Normal | Discount |
| 40 | 20 | 5 – 30 | 5 – 22.5 | 2 - 55 | 1.2 – 41.25 | 20 - 33 | 20 - 30 |

Source: Thai Customs Department

**Table 2: Structure of Import Tariffs on PVC in ASEAN in 1996-2003 (per cent)**

| Country | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|
| Thailand | 25 | 25 | 20 | 20 | 15 | 15 | 10 | 5 |
| Indonesia | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Malaysia | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 5 |
| Philippines | 20 | 10 | 10 | 10 | 3 | 3 | 3 | 3 |
| Singapore | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brunei | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Source: Thai Customs Department

**Table 3: Structure of Import Tariffs on PVC chain in ASEAN countries (per cent)**

| Description | Indicator | Base Rate | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ethylene Dichloride (EDC)** | | | | | | | | | | | | | | |
| Brunei | F | 0 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Indonesia | F | 5 | | | | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Malaysia | F | 0 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Philippines | F | 0 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Singapore | F | 0 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thailand | N | 15 | | 10 | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Vietnam | | | | | 10 | 10 | 10 | 10 | 5 | 5 | 5 | 5 | 5 | 5 |
| **Vinyl Chloride Monomer (VCM)** | | | | | | | | | | | | | | |
| Brunei | F | 0 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Indonesia | E | 15 | | | | | - | - | - | - | - | - | - | - |
| Malaysia | F | 0 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Philippines | E | 2 | | | | | - | - | - | - | - | - | - | - |
| Singapore | F | 0 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thailand | N | 10 | | 20 | 20 | 10 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Vietnam | | | | | | | | | | | | | | |
| **Polyvinyl Chloride (PVC)** | | | | | | | | | | | | | | |
| Suspension / emulstion | | | | | | | | | | | | | | |
| Brunei | F | 0 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Indonesia | E | 20 | | | | | - | - | - | - | - | - | - | - |
| Malaysia | N | 10 | | | | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 5 |
| Philippines | E | 20 | | | | | - | - | - | - | - | - | - | - |
| Singapore | F | 0 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thailand | N | 30 | | 30 | 30 | 30 | 25 | 25 | 20 | 20 | 15 | 15 | 10 | 5 |
| Vietnam | | | | | | | | | | | | | | |

Source: 1) Thai Ministry of Commerce - Dept. of Business Economics
2) Thai Ministry of Finance G - Dept. of Asean Affairs

# Annex 3

**Table 1: ASEAN VCM demand (thousand metric tons)**

| | Actual | | Forecast | | | | | Growth rate % | |
|---|---|---|---|---|---|---|---|---|---|
| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 1995-2000 | 2000-2005 |
| Indonesia | 279 | 284 | 335 | 426 | 487 | 589 | 1,025 | 15.7 | 11.7 |
| Malaysia | 62 | 62 | 76 | 81 | 81 | 233 | 497 | 30.3 | 16.4 |
| Philippines | 27 | 28 | 30 | 71 | 83 | 102 | 167 | 29.5 | 10.4 |
| Singapore | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 0.0 | 0.0 |
| Thailand | 355 | 340 | 426 | 497 | 573 | 761 | 1,525 | 17.5 | 14.9 |

Source: CHEM Systems

**Table 2: ASEAN VCM capacity (thousand metric tons per year)**

| | Actual | | Forecast | | | | | Growth rate % | |
|---|---|---|---|---|---|---|---|---|---|
| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 1995-2000 | 2000-2005 |
| Indonesia | 150 | 150 | 150 | 150 | 400 | 500 | 500 | 27.2 | 14.9 |
| Malaysia | | | | | | 400 | 400 | 400 | 8.4 |
| Philippines | 7 | 7 | | | | | | | |
| Singapore | | | | | | | | | |
| Thailand | 140 | 140 | 280 | 580 | 580 | 580 | 880 | 44.4 | 13.8 |

Source: CHEM Systems

**Table 3: ASEAN PVC demand (thousand metric tons)**

| | Actual | | Forecast | | | | | Growth rate % | |
|---|---|---|---|---|---|---|---|---|---|
| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 1995-2000 | 2000-2005 |
| Indonesia | 245 | 225 | 300 | 360 | 420 | 560 | 990 | 20.0 | 12.1 |
| Malaysia | 125 | 144 | 166 | 190 | 219 | 290 | 490 | 15.0 | 11.1 |
| Philippines | 60 | 60 | 67 | 75 | 86 | 107 | 168 | 12.3 | 9.4 |
| Singapore | 28 | 29 | 31 | 32 | 34 | 38 | 48 | 5.6 | 4.8 |
| Thailand | 358 | 360 | 430 | 495 | 568 | 750 | 1,502 | 15.8 | 14.9 |

Source: CHEM Systems

**Table 4: ASEAN PVC capacity (thousand metric tons per year)**

| | Actual | | Forecast | | | | | Growth rate % | |
|---|---|---|---|---|---|---|---|---|---|
| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 1995-2000 | 2000-2005 |
| Indonesia | 262 | 271 | 351 | 536 | 536 | 536 | 636 | 18.6 | 10.2 |
| Malaysia | 61 | 80 | 80 | 80 | 80 | 80 | 230 | 23.5 | 10.3 |
| Philippines | 42 | 42 | 42 | 112 | 112 | 112 | 112 | 21.7 | 10.2 |
| Singapore | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 0.0 | 10.2 |
| Thailand | 304 | 435 | 535 | 605 | 739 | 739 | 1,039 | 19.0 | 0.0 |

Source: CHEM Systems

# Annex 4

# Background information on Thailand

| | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996e | 1997f |
|---|---|---|---|---|---|---|---|---|---|
| **A.Population** | | | | | | | | | |
| Population (million) | 55.9 | 56.3 | 57.0 | 57.8 | 58.3 | 59.1 | 59.8 | 60.5 | 60.8 |
| Labour force (milion) | 30.4 | 31.2 | 31.8 | 32.4 | 32.9 | 33.2 | 33.6 | 34.0 | 34.4 |
| **B. Production and Investment** | | | | | | | | | |
| Agriculture (%) | 9.6 | -4.6 | 6.5 | 6.0 | -1.8 | 5.5 | 3.0 | 3.3 | 3.0 |
| Real GDP growth – Total (%) | 12.2 | 11.2 | 8.5 | 8.1 | 8.3 | 8.7 | 8.6 | 6.7 | 6.4 |
| Trade, services and others (%) | 9.7 | 12.9 | 6.6 | 7.3 | 9.1 | 8.6 | 8.2 | 6.6 | 6.5 |
| GDP at current prices (bil. Baht) | 1,857 | 2,186 | 2,507 | 2,827 | 3,164 | 3,601 | 4,125 | 4,641 | 5,156 |
| **C. Inflation** | | | | | | | | | |
| | 5.4 | 6.0 | 5.7 | 4.1 | 3.4 | 5.1 | 5.8 | 5.9 | 4.7 |

Note: e – estimated and f – forecasted
Source: National Economic and Social Development Board and Bank of Thailand

| Balance Sheet of Vinythai Public Company Limited<br>As at December 31 | | |
|---|---|---|
| | **1996** | **1995** |
| **ASSETS** | | |
| **Current Assets** | | |
| Cash in hand and at banks | 29,970,934 | 25,740,329 |
| Deposits with financial institutions | 70,000,000 | 37,000,000 |
| Accounts receivable-trade | 560,516,890 | 531,374,597 |
| Amount due from related companies | 209,299,092 | 153,201,620 |
| Inventories | 634,136,596 | 665,996,280 |
| Prepaid expenses | 37,911,201 | 23,228,193 |
| Advance to subcontractor | 505,328 | 129,472,589 |
| Other current assets | 35,691,964 | 32,068,885 |
| **Total Current Assets** | 1,569,051,644 | 1,625,740,084 |
| Investment in associated company | 203,221,440 | 264,960,000 |
| Investment in other companies | 404,843,700 | 330,625,000 |
| Property, plant and equipment | 10,350,770,107 | 4,176,171,150 |
| Project costs under construction | - | 5,740,715,297 |
| Other assets | | |
| Pre-operating expenses | 756,329,209 | 636,787,293 |
| Deferred floatation expenses | 62,096,890 | 65,546,717 |
| Deposits and others | 28,444,880 | 25,200,586 |
| **TOTAL ASSETS in Baht** | **13,383,757,870** | **12,865,746,127** |
| | | |
| **LIABILITES AND SHAREHOLDERS' EQUITY** | | |
| **Current Liabilities** | | |
| Bank overdrafts and loans from banks | 4,667,980 | |
| Accounts payable – trade | 94,734,598 | 671,895,639 |
| Other accounts payable | 146,057,772 | 27,594,275 |
| Current portion of long-term debt | 607,305,268 | 521,643,927 |
| Accrued expenses | 346,047,921 | 236,723,817 |
| Other current liabilities | 4,308,012 | 12,146,349 |
| **Total current liabilities** | **1,410,882,949** | **1,834,244** |
| Long-term loans – net of current portion | 6,564,929,866 | 7269,430,109 |
| Long-term loans from related companies | - | 1,055,324,250 |
| **TOTAL LIABILITIES** | **7,975,812,815** | **10,158,897,603** |
| **SHAREHOLDERS' EQUITY** | | |
| Share Capital | 6,022,971,990 | 3,012,250,000 |
| Share premium | 1,125,000,000 | 1,125,000,000 |
| Deficit | (1,740,026,935) | (1,430,401,476) |
| Total shareholders' equity | 5,407,945,055 | 2,706,848,524 |
| **TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY** | **13,383,757,870** | **12,865,746,127** |

| Balance Sheet of Thai Plastic and Chemicals Public Company Limited<br>As at April 30 | | |
|---|---|---|
| **ASSETS** | | |
| **Current Assets** | | |
| Cash in hand and at banks | 25,727,510 | 73,170,070 |
| Deposits with financial institutions | 400,000,000 | - |
| Accounts and notes receivable | 1,648,662,120 | 2,080,794,924 |
| **Less** allowance for doubtful accounts | (9,172,275) | (9,172,275) |
| Net accounts and notes receivable | 1,639,489,845 | 2,071,622,019 |
| Inventories | 1,450,884,044 | 1,396,212,255 |
| Other current assets | 502,380,503 | 239,012,118 |
| **Total Current Assets** | 4,018,481,902 | 3,780,016,462 |
| Investment in and loans to subsidairy, associated and other companies | 621,511,553 | 281,815,019 |
| Property, plant and equipment | 4,206,760,789 | 3,847,034,999 |
| Other assets | 315,233,411 | 273,583,474 |
| **TOTAL ASSETS in Baht** | **9,161,987,655** | **8,182,449,954** |
| | | |
| **LIABILITES AND SHAREHOLDERS' EQUITY** | | |
| **Current Liabilities** | | |
| Bank overdrafts and loans from banks | 1,949,615,484 | 1,387,356,441 |
| Borrowings from financial institutions | 60,000,000 | 380,000,000 |
| Accounts and notes payable | 561,582,330 | 675,596,960 |
| Current portion of long-term debt | 259,453,333 | 349,999,900 |
| Other current liabilities | 125,299,472 | 189,214,428 |
| **Total current liabilities** | **2,955,950,619** | **2,982,167,729** |
| Provident and pension funds | 40,722,336 | 45,172,859 |
| Long-term loans | 1,081,720,000 | 1,322,973,333 |
| unearned income | 43,051,448 | 30,000,000 |
| **Total liabilities** | **4,121,444,403** | **4,380,313,921** |
| **SHAREHOLDERS' EQUITY** | | |
| **Share Capital** | | |
| Registered capital | 875,000,000 | 870,000,000 |
| Issued and paid-up capital | 875,000,000 | 750,000,000 |
| **Premium On Share Capital** | 2,700,000,000 | 1,200,000,000 |
| **RETAINED EARNINGS** | | |
| Appropriated | | |
| Statutory reserve | 87,000,000 | 50,000,000 |
| Reserve for retirement | 1,000,000 | 1,000,000 |
| General reserve | 954,000,000 | 654,000,000 |
| Unappropriated | 423,543,252 | 1,147,136,033 |
| **Total shareholders' equity** | **5,040,543,252** | **3,802,136,033** |
| **TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY** | **9,161,987,655** | **8,182,449,954** |

# Tutorial Notes

# Teaching Notes

## 1. Synopsis

The case study gives a description and analysis of the competitive strategy at entry of Vinythai, a joint venture between Solvay, a world renowned Belgian company in the petrochemical sector, and the C.P. Group, a dominant Thai company, the core activities of which are in agribusiness.

After its establishment, Vinythai was confronted with a different environment, both at the world market of its end-product (PVC) and its raw materials, and at the Thai market, where the company faced cut-throat price competition from the former monopolist, TPC. The case study focuses on the impact on Vinythai's strategy of these rapid changes in the external environment. Strategic decisions of vertical integration and the use of non-price competition (quality, variety, service) are thus put into perspective.

Another change in the environment of Vinythai was the AFTA (ASEAN Free Trade Agreement), in particular the Thai government's decision to liberalize the petrochemical imports, which provoked both Vinythai and its main competitor on the Thai market, TPC, to increase production capacity. A last change in the environment was the economic turmoil in Asia, triggered by Thailand's devaluation of the Baht on July 2, 1997, which resulted in foreign exchange losses for Vinythai, but also in gain in competitiveness on the foreign markets.

## 2. Target audience

The case-study is to be used in teaching, particularly in graduate level courses on International Strategic Management, International Business Operations, Environment of International Business and International Trade Policy. The case-study is also particularly suited for special courses on Asia-Europe business relations, and for business training programmes on this topic.

## 3. Teaching Objectives

The major teaching objective is to provide students and trainees analytical insight in the strategic decision making process of internationally operating companies.

Additionally, in using the case-study the students and trainees will become familiar with the intricacies and uncertainties related to the formulation and implementation of international business strategies as follows:

- Unanticipated or insufficiently anticipated reactions of the market and the competition.
- Changes in the international trade policies and instruments in host countries, in particular Thailand, such as the reduction of the tariff and non-tariff barriers.

Other teaching objectives are: to make students in International Economics and International Trade Policies familiar with the nature of inefficiencies of production under government protection, as well as with the political economy of protection, such as rent-seeking and lobbying for further protection. The case-study also aims at making Asian students in the above-mentioned fields familiar with the effects of regional integration, in particular the creation of the ASEAN Free Trade Area (AFTA).

## 4. Assigned questions

**What is Vinythai's competitive advantage?**

- Quality of product and service.
- Vinythai chose to emphasise international standard quality and variety. Consistency is another factor by which Vinythai wanted to differentiate itself from its domestic competitor, TPC. Because converter plants of PVC were becoming more and more automated, a consistent quality did no longer oblige them to adjust their equipment all the time. Since Solvay's technology was more recent and more advanced than TPC's, Vinythai could deliver much more consistent quality. In order to enable quality control as a competitive advantage, Vinythai built a product testing laboratory, which operated under the supervision of experts. Vinythai also sends product samples to Solvay S.A., for quality control purposes to ensure that the PVC produced is comparable to the worldwide standard. In November 1995, Viythai also launched an ISO-9002 Certification Project for its manufacturing process and product quality, which was accepted in mid-1997. Another factor for differentiation pursued by Vinythai, is quality of service, i.e. quality related to marketing and sales, delivery time and after-sales technical support. Vinythai was the first company in Thailand to introduce a Customer Technical Services Division (CTS), which develops new grades of PVC to better meet customer's needs. In addition, Vinythai also received considerable support from the research centre of Solvay in Belgium for the development of new product applications and new grades.
- Smaller and much more flexible organisation, which enables Vinythai to react quicker than TPC to the new needs of the customers.
- More recent and more advanced technology than TPC's.
- Support of the research and development centre of Solvay.
- Thailand's first producer of PVC emulsion.

**What were Vinythai's disadvantages at time of entry?**

- Higher depreciation cost.
- Higher financial cost.
- Smaller production capacity.

the relevant data are in the case study under section 4.1, 4.2 and 4.3.

**What external factors influenced Vinythai's performance? How did Vinythai react to improve its performance?**

- External factors
  - ◊ The situation of the world and domestic PVC market: depressed during most of Vinythai's start-up phase (demand reduced, while supply increased). In addition, the PVC output in

Thailand became increasingly less competitive in the world market, because of drastic increases in wages in Thailand's petrochemical industry and a much higher inflation rate than in the USA while the exchange rate of both currencies remained partly linked. Thailand lost competitive advantage for export, especially to Europe, where leather and plastic products graduated from the EU General System of Preference -scheme in the mid- nineties.

◊ The introduction in Thailand in May 1995 of more liberal policies made the Thai government reverse its previously given promise of industry protection during a period of 10 years in order to enable petrochemical companies under National Petrochemical Complex 2 (NPC-2) to establish themselves in the market. This decision of import duty reductions for petrochemical products was the result of commitments Thailand made under the ASEAN Free Trade Agreement (AFTA), the Uruguay Round of the GATT and the trade liberalisation of the Asia Pacific Economic Council (APEC). This caused short-term adverse effects on Thailand's petrochemical industry. It had a negative effect on Vinythai in particular, as it had not been able yet to improve its financial situation after the heavy investment burden. And as Vinythai heavily depended on the local market for its supplies of raw materials, its competitiveness ran the risk of being eroded away completely.

It is expected, however, that AFTA will have long-term beneficial effects on Thailand's petrochemical industry. In 1995, Thailand had the largest PVC production capacity in ASEAN countries and it was expected that the exports to ASEAN countries would expand as a result of AFTA, as the production capacity within ASEAN countries was not sufficient to meet internal demand. On the other hand, Thailand is wary that with the Common Effective Preferential Tariff (CEPT), non-ASEAN petrochemical manufacturers like Japan, South Korea, Taiwan and Saudi Arabia, would use Singapore as a re-export base for their plastic pellets for the purpose of dumping on the Thai markets, as it is very difficult to determine the origin of the contents of plastic pellets despite the AFTA rules of origin.

◊ The Asian financial crisis. The financial crisis in Asia, precipitated by the floating of the Baht exchange rate on June 2, 1997, and the resulting severe liquidity problems, caused many companies in Thailand to suffer heavy exchange losses and shortage of working capital. PVC supply in Thailand is higher than demand, putting downward pressure on profits, and also the export markets prove to be highly competitive, since the producers in other Asian countries are experiencing the same problems as in Thailand.

- Reaction Vinythai

  The management of Vinythai launced mid-1996 a strategic action plan, in order to prepare Vinythai for the global market. This cost reduction plan included the following elements:

  ◊ lobbying;
  ◊ further measures to reduce costs;
  ◊ measures to increase revenue;
  ◊ improving internal communication;
  ◊ fully integrating the production process and increasing production capacity;
  ◊ re-organising the company;

- increasing capital;
- improving quality;
- product and process development.

- **Vertical integration vs. non-integration**

  An interesting discussion is whether Vinythai's competitive position has benefited from vertical integration (see section 4.3) compared to TPC's strategy. Apparently, the answer seems to be different according to the moment in time that is considered. As long as the world price of the VCM is lower than the cost price of the domestically produced VCM (integrated vs. non-integrated production) and government economic policies (industrial policy, trade policy , etc.) are often changing rapidly, non-integrated production of PVC is better. However, the result of such a calculation critically depends on the exchange rate of the Thai baht, making VCM import prices after 1997 devaluation of the bath much more expensive.

- **Has Vinythai been successful?**

  In 1997, before the floatation of the Baht, Vinythai had captured 37% of the market, with TPC holding 51% and importers 12% of the market. Taking into account that TPC has been in the market much longer, this proves that the company has been highly successful in a short time period by rapidly increasing its market share. This was obtained by its competitive price, technology, quality of products and services.

  The financial crisis that affected most of the Southeast Asian countries in the second half of 1997 made it clear that the company’s decision to fully integrate the plant was the right strategy. As the company is no longer relying on imported raw materials, the 1997 depreciation of the Baht, together with the cost reduction plan of 1996 that was pursued in 1997 and 1998, also boosted its overall competitiveness.