Chapter 2 Iron and Steel

2 − 1

Intensive Steel Seminar
(Minutes)

Vietnamese and Japanese members of Trade and Industry Group

Date: 8:30-17:00, October 16, 2000

Place: Daewoo Hotel, Hanoi

Vietnamese side

Active participants:

Nguyen Quang Thai (DSI/Vice President)

Pham Quang Ham (DSI/Former Director, Industry Department)

Do Huu Hao (MOI Institute for Industry Policy & Strategy/Director General)

Nguyen Kim Son (Viet Nam Steel Corporation/President)

Pham Chi Cuong (VSC/Vice President)

Nguyen Huu Tho (VSC/Planning and Investment Department)

Hoang Duc Than (National Economic University)

Bui Van Muu (Polytechnic University)

Ngo Tri Phuc (Polytechnic University)

Other participants:

Pham Hong Chuong (NEU), Tran Hoe (NEU), Nguyen The Anh (NEU), Dinh Huy Tam (VSC), Nguyen Van Vinh (MPI/DSI), Vu Thi Ngoc Phung (Viet Nam Economic Association), Nguyen Thi Nga (MPI/DSI), others.

Japanese side

Active participants:

Kenichi Ohno (National Graduate Institute for Policy Studies)

Fukunari Kimura (Keio University)

Nozomu Kawabata (Tohoku University)

Takao Aiba (Japan Economic Research Institute)

Nobuyoshi Tanaka (JICA expert and Nippon Steel Corporation)

Toshiki Yabuta (Nippon Steel Corporation)

Other participants:

Morimasa Kanamaru (JICA Resident Representative), Daisuke Hosokawa (JICA), Miho Ota (JICA), Tadashi Kikuchi (Keio University), others.

Chairpersons: Ham (morning), Ohno (afternoon)

Interpreter: Dang Dinh Quy

Morning Session

Opening remarks by Kanamaru and Thai (details omitted)

Presentation: Cuong

Let me present my personal opinion, as someone who has worked in the steel industry for 37 years. VSC's masterplan has already been presented and approved by the government [for details, see Tho below]. I have four points.

1. New integrated steel works (NISW) and separate investments in smaller plants are both needed (two-track approach). NISW is large and efficient and will be the core of our steel industry in the future. By contrast, smaller plants are less costly and can be established sooner. Decision to build NISW must be made quickly, since free trade will start to bite by 2010 or so.
2. We will initiate the production of flat products, currently all imported, by building cold rolling mills (CRM) and hot strip mills (HSM). The first HSM should be a prior investment to NISW. If it is built separately, securing the supply of slabs will be difficult.
3. For steel making, NISW is the correct answer. Electrical arc furnaces (EAF) alone will be too small to fill our need and face the shortage of input (scrap).
4. Regarding the rehabilitation of Thai Nguyen Iron and Steel Corporation (TISCO) and Southern Steel Corporation (SSC); TISCO's capacity is being expanded to 240,000 t using Chinese technology, completed by 2001. Additional expansion to 500,000 or even 1-2 million tons, although suggested, is questionable. Far from the port and markets, TISCO faces an inherent weakness of high transport costs. As to SSC, its current performance is good because of (i) cheap scrap, (ii) import protection, and (iii) low-price orientation of users. But these advantages will disappear in the future, and SSC will lose competitiveness. To avoid this, a combination of closing old plants and building new ones is necessary. As a first step, we want to build an EAF plant in Phu My.

Presentation: Ohno

I have translated VSC's plans into a spreadsheet model and numerically and graphically evaluated four uncertainties. Simulations are based on the 1998 JICA masterplan with necessary updates and subject to further revision [Excel files were provided to MPI, NEU, VSC].

1. Uncertainty over financing: If all is borrowed, debt service and current-account deficit will be too large. If joint venture (JV) is chosen, no such deficits will occur but future profits must be shared (if successful). Also JV means Viet Nam will not have full control.
2. International price fluctuations: during the 1990s, steel prices exhibited medium- term cycles of roughly 5 years. The previous JICA masterplan assumed high prices of 1997, but if this year's very low prices are used, projected profits will be significantly reduced. Either is extreme. It is certain that prices will fluctuate. In my paper, the range of profitability is shown graphically assuming that instability of steel markets will remain basically the same as in the 1990s.
3. Tariff scenarios: five cases are examined: full AFTA compliance, zero tariffs, high tariffs, moderate tariffs, temporary moderate tariffs. High tariffs will naturally boost profitability, but actually it cannot be chosen due to international pressure and adverse effects on steel-using industries.
4. Investment timing: two-track gradualism, single-track NISW construction, and accelerated single-track NISW construction are compared. The last will require an enormous sum beyond Viet Nam's financial capacity. The first will need less (but still large) amounts.

Kimura

Under AFTA, protection will become hardly possible by 2006-10 although there may be some room during the transition years. Two points should be mentioned. First, the AFTA deadline—2006 for Viet Nam—may be delayed due to Malaysia's desire to protect automobiles, but it will arrive sooner or later. As to WTO, days are gone when high tariff ceilings were permitted; some countries, such as Mongolia, had zero tariffs before entering WTO. Viet Nam must also prepare for low tariffs. Second, steel is an industry with potentially large forward and backward linkage. FDI was key to the creation of supporting industries in other ASEAN members. If steel is overly protected in Viet Nam, high steel prices may discourage FDI inflows and no supporting industries may grow.

Aiba

I am a credit analyst with international experience including China. To me, VSC's plan for NISW looks too

risky and hasty; it is not a project that can be financed on a commercial basis. Although financial data of VSC are not entirely open, let us assume a turnover of USD 500m, net income of USD 6m, and depreciation of USD 5-7m. The rule of thumb is that maximum commercial bank borrowing is 10 times the cash flow (net income plus depreciation), which means that VSC can safely borrow about USD 100-150m. On the other hand, the proposed NISW will require USD 6 billion—10 times the turnover and a thousand times the profit. This amount is out of question, from the viewpoint of credit analysis (the first CRM alone, USD 100+ million, may be affordable). VSC considers steel as the backbone of the entire economy. But this will be a very weak backbone in Viet Nam. Mr. Ohno's simulation predicts a string of losses up to 2020, but this will mean bankruptcy if it is an ordinary joint stock company. Viet Nam must be very careful in steel investment.

Cuong

We admit that the biggest problem is financing and rapid construction of NISW will be risky. But it must be remembered that this is not a VSC project, but a national project with government involvement for the purpose of reducing imports. In other ASEAN countries, blast furnaces are built by the government even though their steel companies are more profitable than us. Of course, VSC cannot finance it alone. As to the concrete steps toward NISW, no consensus exists and I myself am not sure. It will depend on the financial capability of the government and VSC. We hope to complete the first step toward it by 2010, but many problems are already arising.

Tho

We appreciate Japanese advice on many aspects of our industry. We too have studied these issues for long. Let me briefly explain VSC's masterplan using transparencies. We have three investment scenarios (base, high, low) up to 2010 [These transparencies were later provided on a confidential basis]. The base scenario builds HSM in 2009, CRM in 2010, and slab production in 2012, as prior investments for NISW. The high case assumes HSM in 2005, CRM in 2006, and slab production in 2010. In the low case, NISW construction will not be started before 2010 (preparations only) while HSM is built in two steps: hot coil production with imported slabs in 2006, and slab production in 2009. This low case is similar to Mr. Ohno's "gradual" scenario.

Tanaka

Steel investments should begin with relatively inexpensive and profitable downstream plants, gradually and separately from NISW. As to flat steel production, appropriate capacity will be about 30-50% of domestic demand. Domestic demand for flat products is expected to grow from the current 1 million to 3 million tons

in ten years. Timely investment is needed.

As to quality and product mix, Viet Nam should target ordinary carbon steel of high quality. To achieve this, appropriate latest proven technology must be carefully chosen. Specifically, 6Hi is recommended for CRM and Coil-Box-Tandem for HST. Ladle furnace is traditional technology but will contribute significantly to quality and productivity. To produce a broad range of products, blast furnace-basic oxygen furnace (BF-BOF) technology is more suited than EAF. Long products can be produced by EAF, but flat products will require BF. If EAF is to be also used, choose the latest proven type with easy maintenance.

Metal source also requires careful consideration. In order to secure a stable supply of imported scrap, long-term contracts with a reliable trading company will be desirable. If direct reduction iron (DRI) is to be adopted, it can lower the dependency on scrap. If domestic coal is to be used, the right kind of DRI technology must be chosen. Smelting direct reduction is not yet established technology and Viet Nam should not adopt it now.

Afternoon Session

Presentation: Hao

Steel promotion policy is still under consideration by the government. I will present my personal view. First, the priority should be import substitution to meet domestic demand. At the same time, product diversification from construction steel to hot rolls, cold rolls, special steel, alloys etc. should be attempted. Second, we must combine traditional integrated mills (BF-BOF) and other specific methods (DRI, EAF-continuous casting (CC), etc.). Ways to utilize domestic natural gas should be explored. Third, investment financing will mainly be domestic, but the possibility of foreign JVs will not be ruled out. Fourth, downstream segments grew during 1991-2000, but emphasis must now be shifted to upstream during 2001-2010. As to the timing of NISW, various opinions exist—this issue is of course related to the feasibility of upstream investment.

Domestic steel demand is expected to grow robustly in the future. We hope to achieve a self-sufficiency ratio of 70-80% by 2010.

The big problem with our steel industry is shortage of domestic billets. We aim to boost billet production from the current 400 thousand tons to 1.0-1.4 million tons during 2001-05, achieving a sufficiency ratio of 50%. This will require development of domestic mines in Thai Nguyen, Cao Bang and Lao Cai. Locations of

CRM, HSM and EAF-CC mill should be carefully selected. The capacity of SSC must be expanded. We also need pre-F/S and F/S for NISW with the use of Thach khe ore. We already have a few feasibility studies, but with different conclusions. I personally support the use of Thach khe ore and the initial capacity of 2.5 million tons, with later expansion.

During 2006-10, three steel industry centers should be established: Thai Nguyen in the North, NISW in Ha Tinh (North Central Region) using Thach khe ore, and SSC in the South. The biggest obstacle is financing. As Mr. Aiba noted, VSC alone cannot finance it. The government should mobilize all possible means including long-term subsidized loans. High tariff protection cannot be used, but specially reduced electricity and gas prices are worth consideration.

Presentation: Yabuta

I am a flat product specialist with 25 years of experience. Steel is an industry with extensive forward and backward linkage. It is a heavy industry requiring complex and delicate processes which must be integrated into one coherent system. If everything goes smoothly, it takes 21 days from injection into BF to final products. But even one hitch greatly lowers operation efficiency. There are only a few steel mills in the world that achieve consistently high operation efficiency. Low operation ratios are common even in Europe and America. Exceedingly low efficiency of 50-60% is often observed in developing countries. This is so because producers purchase machinery without acquiring necessary operation and maintenance skills. Demand constantly diversifies while machinery constantly depreciates. To fill this gap, frequent maintenance and occasional revamping are required.

Moreover, a large number of managers and engineers are needed to operate these integrated machines. Also, one NISW employs great amounts of computer memories and terminals, and tens of thousands of cranes and motors. You must understand how difficult it is to operate this complex and huge system on a commercially viable basis. In our company (NSC), a large number and a great variety of engineers are at work. Computer software alone is so voluminous that it is managed by one of the largest software companies in Japan. I would like to emphasize that the steel industry requires an extensive support of related technological systems.

Presentation: Tanaka

I would like to comment concretely on the proposed NISW. At present, there are 141 large blast furnaces (BF) operating in the world, of which 15, mainly in Asia, were added in the 1990s. The crucial thing about BF

today is large capacity and longevity. This is true also in Japan, where firms try to extend the life of large BFs as much as possible. To achieve this, a complex high-tech system, unthinkable before, is utilized. If a new BF is to be built in Viet Nam, its capacity should be at least 3,000m^3 (2 million tons/year) and if possible, over 4,500m^3 (3 million tons/year). Large BFs are more efficient and can compete with newer processes such as Corex, Romelt, Dios, etc.

The construction cost of NISW, measured in hot coils, will be about USD 1,000/ton. Assuming an interest rate of 7.5% and maturity of 10-20 years, the depreciation cost will be USD 100-150 per a ton of hot coils. If a medium-sized BF is built in inland Thai Nguyen, its cost will be much higher than when a more appropriate site is chosen. Such a plan will be unrealistic.

NISW, requiring huge investment, should be built in the following steps. First, build smaller downstream plants (HSM, CRM, etc.) separately from NISW. Second, consider coal-based DRI or smelting reduction which can use domestic resources. These should be linked with proposed billet centers. Third, NISW should be built from downstream and only when domestic demand is large enough. After completion, steel production by NISW and EAFs (i.e., billet centers) should meet 40-50% of domestic demand.

Ohno

As a co-chairperson, let me sum up the discussion so far. The biggest question is of course the speed of NISW construction. In addition, we have identified the following issues:

1. Should Thach khe be used as a main input to NISW, or should ore be imported?
2. Should TISCO be further expanded to become a steel center in the future?
3. What is the proper tariff system?

In free discussion, please refer to these points as much as possible.

Muu

Let me first respond to the co-chairperson's points. First, NISW should be built before 2010. Preparations should begin immediately. Second, thorough F/S of Thach khe ore has not been conducted, and no consensus has been reached. In my opinion, Thach khe ore—and other domestic raw materials—should be supplementary inputs after 2010. Exploration should however begin right now. Third, Thai Nguyen is far from both materials and markets and is therefore not a good candidate for a steel industry center. TISCO's capacity should not be expanded beyond 500,000 tons/year. Fourth, temporary tariff protection is necessary, especially in initial years.

Absorption of management skills will take time, and we must immediately begin to learn it. We thank JICA for all the studies in the past, but the masterplan must be translated into specific investment plans. Financing, management skills, domestic raw materials must also be considered in designing concrete steps.

Primary concerns for the near future are: (i) rehabilitation of existing plants to improve technology and supply capacity; (ii) securing scrap supply, expand efficient EAFs and close inefficient ones; (iii) methods and processes to utilize domestic resources must be studied; and (iv) build a plant to produce various alloys, to meet diverse demand.

Than

JICA's studies are academically respectable, but for practical applications we need a broader context including financing and cost-benefit analysis. The steel question is not of one company or one industry; steel is a national industry and the government should officially support it.

Interests of politicians and the steel industry (producers and importers) are often in conflict. Some politicians want to build NISW at any cost, but that will not be sustainable in the long run. Private importers are after their own short-term profits and welcome rising imports. To promote steel, profitability of VSC is an inappropriate indicator. Investment decision must be made by an economy-wide criterion. Even if VSC encounters losses, steel-using industries may develop and become competitive. If so, steel promotion is worth its cost.

It is important to jump to latest technology. Otherwise, low competitiveness, losses, and permanent subsidies will be the result. This cannot be achieved by one company alone, so official help is essential. Let me point out four objectives. First, financing is beyond VSC or government budget. Inflow of FDI is still not enough. The government should designate steel as a high priority industry, much above present treatment. Second, we need F/S on the usability of domestic raw materials. Third, I believe the domestic market is sufficiently large, but no precise projections have been made. Fourth, despite Mr. Yabuta's contention that steel requires a complex technological system, I believe Viet Nam can quickly absorb necessary skills. I do not worry about it.

NISW should be completed after 2010. But preparations must be made before 2005, and construction must start following that.

Phuc

I was much interested in the presentations by JICA and VSC. For Viet Nam, the only advantage is that of a latecomer; we can learn and introduce optimal technology from other countries. On the other hand, we have many disadvantages: low competitiveness due to high cost, outdated equipment, quality good enough only for construction bars, etc. As Mr. Kimura points out, we must join AFTA and compete internationally. But I cannot agree with the idea that small plants should be initially built. From the beginning, we should establish modern large-scale steel works.

I agree with Mr. Than that the biggest problems are financing and the use of domestic materials. Financing must be the responsibility of the government. As to the usability of domestic resources, a few foreign studies exist, but no study has been conducted by the Vietnamese. We ourselves must study and come to a conclusion, be it Thai Nguyen expansion or Thech khe ore. Some people have warned that Thach khe ore is of low quality, but technical problems can surely be overcome in the future. Others noted high transportation cost of Thai Nguyen, but this is no problem either. Since Viet Nam is now investing in transportation infrastructure as a matter of priority, shipping cost for Thai Nguyen will be reduced, sooner or later. In conclusion, NISW should be established at the earliest date. The year 2010 is not soon enough.

Kimura

Even if gradualism is adopted, under international integration, VSC's strategy will become extremely important. The key issue is how to deal with inefficient units. With AFTA, some outdated plants will inevitably be driven to closure—but that is good. The highest priority for VSC is to design a policy of productivity improvement so that relatively efficient plants can survive. TISCO is an inefficient unit with excessive employment. Under integration, good plants should not be sacrificed for the survival of bad plants. Similarly, domestic materials should be used only when they are very cost-effective by international standards.

Ohno

Mr. Phuc said that Thai Nguyen's transportation cost would be reduced in the future. But we already have a super highway from Hai Phong port to Hanoi, and from Hanoi to Thai Nguyen the road is not so bad either. Even so, Thai Nguyen suffers from high transportation cost and this can hardly be lowered in the future. As to Thach khe ore, I understand that its high zinc content is a serious problem for BF operation. It is much better to import the kind of ore with ideal quality and composition. The profit margin of the steel industry is very slim, and any compromise in plant location or materials will be fatal in the international survival race.

Yabuta

We also used high-zinc ore in Japan thirty years ago, but that required frequent stoppage and maintenance of BF, which was very inefficient. We no longer use such ore, and no engineer at our company (NSC) remembers the technology for it. We now face another type of high-zinc problem: how to extract zinc contained in automobile scrap.

Phuc

Zinc in scrap and zinc in ore are completely different problems.

Son

Our steel industry is facing great challenges in the age of integration. It is imperative that we should incur no losses while steel is being supported. Viet Nam should closely examine the feasibility of each proposed steel project. VSC has a two-pronged strategy: short-term independent investments and long-term NISW. The former consist of seven projects such as TISCO and SSC rehabilitation, billet centers in the North and South, first CRM, first HSM, etc.

One question is whether the first HSM should be a prior investment to NISW or separately built. If separately built, stable supply of scrap may not be secured. For this reason, we believe HSM No.1 should be part of future NISW.

We have no consensus on the timing of NISW construction. Some say the first BF should be completed by 2010, but we at VSC consider 2012 to be a more reasonable target. Mr. Tanaka recommends an even later date. If we want to use temporary protection, early construction will be better, before the AFTA deadline. But if we think of financing, a gradual approach will be suitable.

Regarding steel, we have many disagreements in Viet Nam. First, we at VSC think that there is no input supply problem with CRM but slab supply for HSM may be difficult to obtain. Second, the location of NISW is hotly debated. Some propose to build NISW in Thai Nguyen with the capacity of 1.3-3.0 million tons, but we disagree. Thai Nguyen is displaced from materials and markets, hardly an ideal location. NISW must be at a port in Central Region. Third, as to the timing of NISW, the proposal of VSC aims at the first BF in 2012, covering 50% of domestic demand. Our masterplan has already been submitted and approved by the government. Before and after the approval, our views remained the same.

Closing remark: Ohno

In steel promotion, financing is among the biggest problems and it appears there are only two ways to overcome it. And at present, neither way faces bright prospect.

The first is for government to designate steel as the highest priority national industry and pour a large amount of soft policy loans into it. But whether the government will do so, and whether steel deserves such a privilege in the first place, remains uncertain. People who study steel like us often develop emotional attachment to this industry, but it is not the only industry in Viet Nam. The merit to the national economy as a whole is a more important concern.

The second is to find foreign partners willing to share costs. Cooperation with foreigners will also facilitate information collection, technology transfer, shock response, etc. On the other hand, joint venture means the Vietnamese side will not have full control of the projects for the pursuit of national interest. Foreign investors are often interested only in short-term commercial profits; they have no obligation to act on behalf of Viet Nam's industrialization. Incidentally, ODA funds are no longer available for industrial projects like steel.

Let me summarize the Japanese view presented today. We are not against Viet Nam's plan to establish NISW as a long-term goal, but it must be achieved gradually and in two tracks, because of financial constraints and the necessary lead-time to learn the skills to manage a huge plant complex and to cope with integration shocks. We do not consider it proper to finalize the site of NISW and begin to commit financially to it at present.

I thank your active participation in this seminar. Members of Trade and Industry Group, let me again remind you that we are to submit our drafts by November 15 and exchange comments prior to Hanoi Workshop in December.

(By Kenichi Ohno and Tadashi Kikuchi)

2 – 2

Summary of the Japanese Views on Steel Industry and Trade Policy[1]

Japanese members of Trade and Industry Group

Japan-Viet Nam Research Project

1. Overview on steel industry promotion

We, on the Japanese side, conditionally support Viet Nam's effort to designate steel as a national industry, aim at partial import substitution, plan a new integrated steelworks (NISW) as a long-term goal, and realize these objectives under restrained import protection. The condition for our support is that Viet Nam should implement these with sequencing and methods that are realistic and concrete. It will take a long time for Viet Nam to learn steel production technology and operational know-how appropriate for international integration. At present, Vietnamese enterprises do not possess sufficient technology or management skill, and the Vietnamese government lacks a proper policy framework or crisis management capability. It is risky to try to promote capital-intensive industries, including the steel industry, without simultaneously strengthening domestic capability. We urge Viet Nam to use the rather difficult process of steel industry promotion under international integration as an excellent opportunity to improve domestic capability. In promoting the steel industry, we do not consider it proper to give it a very special priority status, well above other candidate industries (however, moderate support on a par with other industries is acceptable). Even in the case of import substitution, a strict criterion based on efficiency and international competition is required.

2. Timing of construction of an NISW

In strengthening the steel industry, Viet Nam should adopt a gradual and two-track approach. That is to say, rather than immediately starting to construct an NISW, Viet Nam should initially build relatively small-scale facilities independently from the proposed NISW—such as a cold rolling mill (CRM), a hot strip mill (HSM) and billet centers—at appropriate sites and step by step (the first track). Only after making adequate preparations and gaining sufficient experiences, Viet Nam should seriously undertake the construction of an NISW mainly during the 2010s (the second track). One possible scenario of NISW construction which we regard as appropriate

[1] This document summarizes the common view at this moment of the Japanese members of Trade and Industry Group (Kenichi Ohno, Nozomu Kawabata and Fukunari Kimura) based on intensive consultations with the concerned members of General Commentary Group (Koichiro Fukui and Takao Aiba) and a JICA expert (Nobuyoshi Tanaka), and the results of Intensive Steel Seminar in Hanoi, October 2000, and Hanoi Workshop, December 2000. It is drafted by Kenichi Ohno.

entails the following: start port construction and land preparation around 2008, complete a CRM and an HSM around 2013, complete the first blast furnace (BF) around 2017, and complete the second BF around 2021. The "Base Case" presented by VSC is also a two-track approach, but it proposes to build an NISW at a much accelerated pace than what we regard as suitable.

We recommend the two-track gradualism above for the following reasons:

(i) By extending the construction period, annually required financial resources will be reduced and the experience of steel promotion can be accumulated. These will in turn facilitate the mobilization of domestic and foreign resources, which will have to be very large eventually.

(ii) An NISW is a huge and concentrated technological complex. Viet Nam needs a sufficient learning time before it can acquire operational and management skills.

(iii) The menu of technology available to Viet Nam is always changing and expanding. To maximize the degrees of freedom, Viet Nam should select technology over time, rather than making irreversible commitments for the entire projects at the outset.

(iv) Adequate room for adjustment must be preserved in order to respond effectively to possible negative shocks, such as global recession, regional crisis, sharp falls in international steel prices or deterioration of the domestic economy. Should an extremely adverse situation emerge, Viet Nam also needs the flexibility to postpone the construction of an NISW for a certain period.

3. The role of the first hot strip mill (HSM1)

In view of the above consideration, we do not take the position that HSM1 should be constructed as a prior investment to the future NISW. Now that Phu My has been selected as the site of the first cold rolling mill (CRM1), we recommend that HSM1 should be built on the site adjacent to it. If HSM1 is deemed as a prior investment to an NISW, its construction is subject to inadvertent delay since an NISW itself may face difficulty in raising funds or other problems and be postponed. For a timely establishment of the domestic supply capacity of flat products in line with growing demand, we consider it important to build HSM1 separately from and in advance of an NISW. Inter-process linkage can be ensured by locating CRM1 and HSM1 on the same site. As to the problem of stable supply of slabs, it must be noted that slab imports will be necessary anyway, regardless of whether HSM1 is built separately from or together with an NISW, until two BFs of an NISW are completed and steel-making capacity is greatly enhanced. To ensure stable sourcing of imported slabs, we recommend long-term contracts with countries which are likely to have excess capacity in slab production. In addition, it may be worthwhile to study the possibility of EAF-based slab production. (As for HSM2, it can be constructed as the same site as an NISW.)

4. Usability of domestic raw materials

We recommend a full-scale feasibility study (F/S) on the usability of Thach khe ore. However, we are already informed that this ore suffers from high zinc content and is not suitable for BF use, and that it will also be difficult to develop due to geographical and geological reasons (deposits are located from and up to 400-700 meters below sea level, requiring vast draining). For the purpose of realizing efficient BF operation under international competition, the extent to which Thach khe ore can be used in BF is impossible to judge at the moment. Usability, required investment and operational costs should be evaluated by a full-scale F/S. If the outcome of F/S is unfavorable, importing 100% of raw materials and deciding not to exploit domestic mines becomes a plausible option. Generally speaking, domestic raw materials should be used only if they are equal to internationally best materials in terms of quality and cost. Any compromise in quality or cost of raw materials will seriously endanger the survivability of the industry under international integration. This is true not only with raw material procurement but also with the location of the NISW or selection of technology as discussed below.

5. Location of the NISW

Regardless of whether raw materials are 100% imported or partially domestically supplied, the NISW should be built on a newly developed coastal site. To guarantee international competitiveness, Viet Nam must select a site suitable for building a deep sea port in Middle Region and use a large specialized vessel to transport raw materials. Inland areas, including Thai Nguyen, are not appropriate for building an NISW due to the permanent handicap in additional land transportation cost. When iron ore can be transported from Australia to Japan for USD 6/ton, the current land transportation cost of USD 6/ton or more between Hai Phong and Thai Nguyen is too large for financial viability.

6. Selection of technology, production capacity and product mix

Viet Nam should avoid both outdated equipment and untested frontier technology. Instead, it should select "state of art technology" from the set of "proven technology." We call this the "fast-second approach." At the level of individual production facilities, capacity must be sufficiently large to ensure operational efficiency. At the national level, the total output should cover only part of the domestic demand. We recommend partial import substitution because it enhances efficiency and crisis response capability. Under partial import substitution (compared with full import substitution), it is easier to maintain high operation ratios in the event of negative shocks. Moreover, technical integrity among different processes must always be the primary concern in making investment decisions. In transfer of technology, random buying of cheapest equipment

should be avoided; instead, a comprehensive technology transfer contract covering basic design to stable operation should be concluded. As to the product mix, what to produce must be selected carefully based on the size and characteristics of domestic demand and avoidance of head-on clash with foreign exporters offering extremely low prices.

7. Financing

Financing is a problem common to all projects, but the difficulty is particularly severe in the case of an NISW requiring huge capital. We recommend the pursuit of joint venture (JV) arrangement (MOI and VSC have announced that 100% foreign investments in steel will not be permitted but JVs are acceptable). JVs are helpful since they share financing, risks and crisis management with the Vietnamese side. In order to attract FDI, however, investment plans must be realistic and concrete and Viet Nam's ability to promote the steel industry must be dependable in the eyes of foreign partners. It should also be recognized that foreign partners are often in pursuit of their short-term commercial interests, and not the national interest of Viet Nam. As noted above, singling out the steel industry as the top priority among all industries and pouring a large amount of scarce national resources into it is not advisable. Such excessive promotion would also militate against the industry's own effort to improve competitiveness.

8. Additional investment in TISCO

The first rehabilitation plan for TISCO looks reasonable, but we doubt whether its second rehabilitation plan is really necessary. As stated above, inland TISCO lacks the conditions to become a steel industry center in the 21st century. Minor repairs to improve efficiency and to cope with the employment problem are desirable, but larger amounts should not be invested in TISCO. For the purpose of minimizing the social impact, TISCO should be allowed to survive as a small-scale steel plant located near raw material supply, as long as low-cost materials continue to be locally available. The idea of locating an NISW in Thai Nguyen must be abandoned.

9. Production of special steel

Special steel is characterized by great diversity, small lots and high quality (with the possible exceptions of structural steel and high-carbon steel produced in relatively large lots and with similar compositions to ordinary steel). We do not recommend building a special steel plant at this time since Viet Nam's domestic demand for this kind of steel will be too small for efficient production in the foreseeable future. Except for the items noted above, special steel should be imported.

10. Export orientation

MOI and DSI suggest steel exports as a target along with import substitution. However, the Vietnamese steel industry is too fragile to become a viable exporter in the competitive and demanding international market (beyond the current tiny exports to neighboring countries such as Laos and Cambodia). We regard import substitution as an appropriate target for now. Even with production for the domestic market, international competitive pressure can be used effectively as an incentive for productivity improvement. The important thing is not how much the industry exports, but whether it is exposed to international competition. Overly ambitious attempt at exporting may even run the risks of excessive investment or selecting the wrong product mix from the viewpoint of the domestic market.

11. AFTA and WTO policies

(i) International integration cannot, and should not, be avoided. Viet Nam should accept a free trade regime in principle. Each industry should take this as given when it conducts (forward-looking) new investments or (backward-looking) consolidation and closure of existing plants.

(ii) Deviation from AFTA (0-5% tariffs by 2006) may be permissible if it is only for a small number of industries, temporary and the tariff rate is only moderately high. Before conducting such a policy, however, concrete and realistic promotion strategies for the proposed industries must be presented. If no such strategy exists, Viet Nam will be unable to negotiate with AFTA or WTO with "ownership."

(iii) In WTO accession negotiations, MFN, "national treatment" and "transparency" must be strictly observed. On the other hand, there is room for negotiation in "market access" and "convergence of economic institutions." For these demands, Viet Nam should decide whether or not to accept them individually and from the viewpoint of economic principles.

(iv) Viet Nam should consider the possibility of using WTO-consistent subsidies (satisfying non-specificity) as a means of selectively supporting domestic industries.

(v) Viet Nam should prepare "anti-dumping duties," "counterveiling duties" and "safeguards" as defense measures against cheap exports from CIS or regional crisis. It must be noted however that these are short-term emergency measures and should not be confused with medium- to long-term industrial promotion policies.

(vi) At present, countries applying for WTO accession are facing demands which are more strict than those for existing LDC members, and some of these demands are unreasonable. It is advisable for Viet Nam to cooperate with countries in similar situations to make an appeal to international organizations and developed countries for fairer treatment.

2 – 3

Some Comments on Strategy on Production and Investment of Steel Industry in Viet Nam up to 2020 (Era of Economic Integration)

Pham Chi Cuong

Viet Nam Steel Corporation

Introduction

In 1990, when Thai Nguyen Iron and Steel Corporation (TISCO) and Southern Steel Corporation (SSC) integrated into Viet Nam Steel Corporation (VSC), the total steel production output was only 100,000 tonnes/ year. From 1990 to 1995, thanks to the reform policy, the steel industry has been invested and developed, domestic rolling steel production output has rapidly increased, reaching 450,000 tonnes in 1995 (more than four times).

Since 1996, the steel industry has kept such development, 13 joint-ventures with foreigners have been putted into operation (of which there were 5 JVs on rolling steel). As of 2000, the rolling steel production output of steel plants under VSC and JVs between foreigners and VSC reached 1.3 million tonnes. If including the production of local producers, 100% foreign-owned companies and private manufactures, the total rolling steel production output came up to more than 2 million tonnes.

The products of the steel industry are mainly the long products (bar, wire rod, small section) used for construction. In 2000, the demand on construction steel is about 1.5 million tonnes and already oversupplied. Meanwhile, the flat steel and mechanical engineering steel products are not manufactured and have to be imported.

For the crude steel, the production capacity and production output of existing steel plants are too small, covering only around 20% demand on billet for rolling mills (current billet production output is around 300,000 tonnes/year). Of this production output, the amount of billet produced from scrap by EAF process accounts for more than 90%, the rest of less than 10% is produced from iron ore in TISCO. Foreign-invested enterprises haven't involved in the production of billet.

As the billet production from iron ore has not been developed (except a Blast Furnace 100m^3 in Thai Nguyen), the domestic iron ore source has not been mass-exploited or carefully studied.

At present, in comparison with other countries in the region, we can say that Viet Nam hasn't been qualified enough to be in the list of steel countries due to the extremely small crude steel production output.

In the strategy on steel development in the coming time, Viet Nam must orient to improve its production on

the billet, to increase the crude steel production output and, at the same time, to diversify the steel products, specifically flat products, plate and sheets, engineering steel and several kinds of alloy-steel to meet the demands of the national economy and the national defense.

Below are comments on some specific matters:

1. New Integrated Steelworks (NISW)

To produce crude steel, the metallurgical industry in the world is relying on the two following main technological trends:

- Using iron-ore to refine pig iron in BF and then producing steel by Blowing Oxygen Furnace (BOF). This is the main technology in almost every metallurgical ISW world-wide. The capacity of these ISW usually ranges from 4 million tonnes per year to over 10 million tonnes per year
- In mini plants, EAF is used to produce steel, where material is scrap (a proportion of direct reduced steel or fluid pig iron can be added). The capacity of these mills is some 1 million tonnes per year.

To intensively enhance crude steel production, we must orientate toward the following trends: In the first stage to construct mini plants and in the relevant next stage to construct ISW. The reason is explained as follows.

If we construct mini plants, operating EAF with scrap, DRI and hot metal from BF, the troubles may be arisen as follows.

1) Small capacity; it is also not easy to enhance production
2) Shortage of scrap, most of it must be imported at unstable price; The low efficiency of running small BF plus difficulties of DRI producing,...
3) Big energy consumption, namely electricity with high cost while the electricity supply is still hard matter in our country.
4) Steel quality is not good enough for hi-tech industries (shipbuilding, automobile, households, and electrical appliances...)
5) There exists the only advantage that is small investment required costing less capital, quick construction and installation & it is able to fill market demand earlier time. Prior to the completion of NISW, mini - type plants are available to timely meet the gradually increasing market demand, also make preparation of labour source that is able to grasp new technology and management system for large-scale plants.

In case of constructing only large scale ISW, the below matters should be considered.

1) Huge investment capital, high investment rate and developed infrastructure conditions are required. This is difficult to carry out in Viet Nam before 2010 since it requires billions of dollars in investment.

2) Domestic demand must be big enough for being the impetus for production expansion of the ISW. ISW's production output will be increased up to several millions tons per year. As the export capability is still very low by hard competition and domestic demand growth ratio has been estimated at only 10%/ year based on annual GDP growth, leading to the oversupply, while the steel production is of small capacity and facing fierce competition.

3) Being operated with very big-scale, the ISW need the investment support from Government. It is impossible for VSC to arrange investment capital and others by itself. By the years of smooth business, annual turnover was around 500 million USD, net profit estimated at 10-12 million USD. ISW requires very huge investment capital (for example, 5 billion USD for 4.5 million t/y ISW), therefore without support from Government, it is impossible to make NISW be feasible.

4) Though ISW can provide the extremely range of product grades with high quality, efficiency is not so enormous, in addition, it need high cost for environmental protection, etc. If we solitarily consider its economic efficiency, it seems to be impossible to be realized. However, from the point of the overall national benefit, the construction of ISW is actually needed. This will be the "backbone" of the steel industry in Viet Nam. Without such a plant, the steel industry is surely keeping the existing situation, always back to the other countries in the region, namely Indonesia, Thailand, Malaysia, and Philippines.

5) To get the highest efficiency for the construction of ISW, we should consider the process and appropriate production scale, also give priority to mobilize inside and outside sources for the project. (Referring the experience in constructing Baoshan steel plants in China and Pohang Steel in South Korea). The ISW is thought to be started at initial capacity of over 2.5 million tonnes/year, operating with conventional process: iron-making by large-size BF, steel-making by BOF, slab and billet continuous casting, utilizing domestic and imported material (iron ore, coal)

- There exist some opinions that we should take longer time to expect the new technology, which is more appropriate for the model of ISW, then we can choose the most specific one. However, we are thinking that we must make the decision as soon as possible:

The first NISW need to be confirmed to be based on proven conventional process, which is being operated to take over 60% of steel production in the world, for the next development stages or other plants, the new processes can be considered later.

Experience of POSCO to install Corex Furnace in Pohang or DRI-EAF in Karakatau, Indonesia should be good examples for us to be consulted. New processes could be considered when the country would have a quite strong basic metallurgical industry.

The early construction of NISW by conventional process will create favourable conditions for Viet Nam steel industry to study and utilize new technologies getting into 21st century.

- Therefore there will be much difficulties arisen by hard discussion on process and capital mobilization in making decision to invest and construct the first NISW. However, trying to become modern industrialized country, we must raise the steadily and rapidly developed steel industry, that can keep in-line with the world, in which NISW will play very important role as "backbone" of the industry.

That is why Government should take conclusive decision soon.

In brief:

- It is necessary to construct a large-scale ISW by conventional process;
- The appropriate time for the construction of the plant, though is expected at earlier time, should be set from 2010 to 2015 because Government must also concentrate on more essential projects such as Son La hydraulic plant, transportation system, oil plants, etc. Prior to the completion of NISW, perhaps we should construct plants of mini type as billet centers, flat production plants, manufacturing mechanical steel plants. I the initial period, we should import steel scrap and billets.
- Government should self-invest in the project, then transfer it to VSC or donate investment capital for VSC to carry out the project step by step. Depending on the capital mobilization capability, we can start from downstream (hot rolling) or upstream (BF-BOF).
- As to the site of the plant, priority must be given for deep-water port condition, next is consumption market and material source possibility.
- Other investment forms (JV, joint-stock) seem to be less prosperous. We should not look for 100% foreign capital, by which way VSC has not been successful previously.
- Government should issue support policies and special protection in the initial period to improve competitiveness of the plant, that is we can get the profit on the point of overall national benefit.
- The trend of integration and globalization does not give favourable conditions for NISW project to be profitable, therefore we should take steady determination and carry it out as soon as possible. Otherwise, the good chance may be lost and there will be more difficulties when the world market become the common market, under domination of some super multi-national capital groups.

As to Thach Khe mine:.

- Up to now, Thach Khe is the biggest iron ore mine in Viet Nam (Reserve of mine is more than 500 million tons).

- Placing near the sea, with hydrogeological and engineeringgeological conditions, it requires big investment for dewatering and mine belt stabilizing, and appropriate exploitation technology for the reasonable capacity to assure its economic efficiency.
- By the analysis on Zn content of iron ore (-0.07%), there exist 2 opinions on the utilization of iron ore for modern BF as below:.
  + Utilize 100% of iron ore with high Zn content in BF by increasing coal consumption and changing furnace structure.
  + Utilize limited amount (around 10%) of Thach Khe iron ore together with other iron ore.
- Experience in operating small-scale BF (< 100m^3) in Viet Nam has shown that high Zn iron ore can be used but its economic efficiency is difficult to be determined because of so high coal consumption in small BF (0.8-1.0 t.coal/t.pig iron) while it is only 0.5t in other countries, it also make unstable operation by hanging with sudden maintenance causing high cost of pig iron.

So the followings are our points of view on Thach Khe project:

- Financial support from Government is needed to conduct FS, then exploitation could be carried out in case of high feasibility - id. the cost f produced ore is less or equal to the imported ore.
- If ISW is put into operation when Thach Khe iron ore is not available or/and too expensive against international price, the utilization of imported iron ore from Australia, India,... will be a normal way.
- Though Thach Khe ore is utilized, high standard iron ore is still needed for BF operation, ratio of which must be examined by actual test, not by impulsive discussion so far. We should study experience of such countries that have used ore with high content of Zn as Frane, Japan and make experiments with Thach Khe ore before making decisions.
- With limited iron ore and scare coke-coal source, ISW must be sited near deep-water port, that is easier for material import for the operation. In addition, steel products of ISW should be transported to localities nation-wide and in the future wil be exported, a sea-port is much needed.
- At present VSC is seeking for a partner to conduct FS on Thach Khe project.

2. Production of flat products

- At present only long products are produced in Viet Nam, most of which are rolled from imported billets. Furthermore, all of domestic long products are of small and medium size with commercial quality. Big size products (large sections, heavy sections etc.) and all of flat products (both hot rolled and cold rolled) have not been produced in Viet Nam. Demand on hot rolled and cold rolled flat products for manufacturing welded steel pipe, galvanized sheets and direct use, are satisfied fully by steadily increasing

imported amount.

- As flat products are provided to the manufacturing mechanical industries (ship building, automobile, electric equipment, home appliance, transportation, etc.), they are considered to be important materials for development of many industries. Therefore, we can say flat product is playing an indispensable role in the realization of industrialization and modernization of the country.
- Being aware of important role of flat products, it is necessary to build up production facilities for manufacturing both hot rolled and cold rolled products. It is time to set up new Hot strip mill and Cold roll mill in order to meet domestic demand and to export.
- Establishing Hot roll and Cold roll mills, it is necessary to adopt a reasonable production capacity based on carefully studied market demand and reliable source of slab supplied for the smooth operation.
- Construction of new integrated steel work is a stable and reliable alternative to provide slab and billet to rolling mills.
- In case of construction of an independent Hot strip mill with minimum capacity of 1.0 million tpy, slab supplying will be one of the most difficulties. It requires a big imported amount while supply source of exporters is limited, unstable at fluctuated price.
- The best alternative, in my view, is construction of Hot strip mill as a first phase of new integrated steel work. In this case, we have to import slab in several beginning year, before completion of upstream facilities (BF-BOF-CCM).
- A combination alternative can be considered. In this case, slabs for the Hot strip mill will be supplied by 50%import and the remain of 50% are supplied by EAF-CCM process. This is a model of Mini-mill type. However, this is an unstable alternative due to a big imported amount of slab and scrap required. Product quality is limited. In addition, this adoption will affect to implementation schedule of the new integrated steel work. Nevertheless, the alternative would be accepted if the DRI project could be successful.

3. Increase of steel-making capacity

- Increasing steel-making capacity is an urgent need for the time being to increase domestic billet for satisfactory, to substitute imported billets.
- Planned projects such as rehabilitation and expansion of TISCO, SSC and setting up new billet centers are aiming to increase EAF steel-making capacity of Viet Nam Steel Corporation to meet the target of 1.5 million ton by 2005.
- To bring up steel-making capacity up to 1.5 million tpy is reasonable and possible for VSC to realize. However the most difficult problem is how to get enough scrap (over 1 million) to fit EAF.
- Pig iron (hot metal and ingot) has been used for EAF, but mainly within TISCO.

- To increase steel-making production, steel industry should overcome problems of raw material supply and should have low power price. Without any of them VSC can not enhance its steel-making production. The same situation had been experienced in the last ten years.
- Normally, production of crude steel brings very low profit, therefore, if we want to increase crude steel production we should have very strong mind, the Government should have appropriate protection for steel industry and strategy for harmonized development of both steel-making and rolling.
- To increase crude steel production output by setting up billet plants is a good idea but it's very difficult to be realized due to low profit and low competitiveness and it need real protection from Government by both tariff and non-tariff system.
- To increase crude steel production by construction of new integrated steel plant is the most appropriate solution. EAF steel-making should be limited at 2 million tonnes per year. Such production level is feasible under the country's conditions.

  There after, large scale BOF steel-making should be applied so that our iron ore can be used.
- To increase crude steel production is more difficult compared with increase of rolling capacity, but it is an urgent need of Viet Nam steel industry, it help to bring up the portion of Viet Nam steel industry among ASEAN countries.

4. Rehabilitation of TISCO and SSC

A. Thainguyen Iron and Steel Corporation.

The project of rehabilitation an expansion of existing plant of TISCO to increase steel billet production up to 240,000 tonnes per year is under implementation and it should be completed in 2001. Right now, TISCO should pay attention to development of raw material resources to be supplied to the project, otherwise, TISCO could not meet the set target.

To transport Cao Bang iron ore to TISCO (with distance over 230 km and transport quantify 150,000 - 200,000 T/y) and import of 80,000T/y scrap are difficult issues.

Whether to continue expansion at 2nd stage up to 500,000T/y and to 1-2 million T/y must be decided only after having very detail feasibility study which confirm project technically feasible and economically viable. The reasons are as follows:

- Raw material and freight cost are serious factors of limitations for the project (For example, material transport from Haiphong to Thai Nguyen costs 10 USD/t and product transport from Thai Nguyen to Hanoi and Haiphong is 7-10USD/t).
- In competition with other steel mills in Viet Nam, Thai Nguyen Iron and Steel Corporation can not

increase its production, because it has higher production cost compared to the near sea-port steel mills.

- Moreover, the available infrastructure in Thai Nguyen Iron and Steel Corporation is not enough for larger production. It need big modification of electricity net, water system, road and railway system, ground clearing, etc which cost very huge investment budget. Therefore it is better to set up a new steel mill near sea-port and near market for more economical efficiency.

B. Southern Steel Corporation (SSC)

Presently SSC is a high profitable company due to following advantages:

- The price of steel scrap bought domestically is lower then that of the imported steel scrap.
- High protection policy of the Government
- The present market of construction steel in Viet Nam don't require high quality for long products.

But the competitiveness of SSC will become worse and worse due to its outdated equipment. High consumption indicators of raw materials and energy will make its production cost higher than that of new steel mills.

It is time for SSC to upgrade its old steel mills by replacing new equipment (oxygen generator, ladle furnace etc...), to close its steel mills which have too back-ward equipment or small capacity as well as high pollution to the environment.

Appropriate solution for SSC is to look for a site near seaport for setting up a new steel mill with Mini-mill process: EAF-LF-CCM-Rolling mill. Phu My project is going on in this direction.

Viet Nam has to complete all items of AFTA Agreement from January 1, 2006. At that time, in my opinion, only steel mills with modern UHP-EAF, together with LF, CCM have enough competitiveness

2 − 4

Overall Strategy for the Development of the Steel Industry up to 2010

Do Huu Hao

Ministry of Industry

1. The current situation of the steel industry and pre-conditions for development

(1) Current situation

Since 1990, the steel industry has taken enormous steps of development, passing the output threshold of 100,000 tonnes per year. In the 1990-1995 period, thanks to the policy of renovation, the steel industry was financed and developed and the rolling steel reached 450,000 tonnes in 1995, a four-fold increase over 1990. Since 1996, the steel industry has kept high growth rate. At present, there are 230 steel producing and processing businesses, of which 15 are State-owned, 14 with foreign direct investment having a total capital of over USD 233 million, 6 companies Ltd. and over 200 private businesses.

In 2000, the production capacity of the steel industry has increased ten-fold over 1990 with the steel rolling capacity of 2.3 million tonnes.

The products of the steel industry are long ones (bar, wire, small section) used for construction. In 2000, the demand for construction steel is only about 1.5 million tonnes and so we can say that the supply has exceeded the demand. Meanwhile, we cannot produce steel slabs, steel sheets or manufacturing steel yet.

One of the drawbacks of Viet Nam steel industry is the discrepancy between the steel rolling capacity and the crude steel production capacity. The production capacity and the crude steel output of Viet Nam is too small, meeting only about 20% of billets for ordinary construction steel rolling. The crude steel output is presently only 300,000 tonnes per year, in which the billets made from electric furnaces using scrap steel account for up to 90%, only 10% of them are made from blast furnace iron and pig-iron ore in Thai Nguyen Iron and Steel Corporation from a small furnace with a capacity of 100 cubic metres.

As to the equipment technology, thanks to the intensive investment, for the time being, there are many quite up-to-date equipment of steel refinery, post-rolling processing, which are of international normal standard. However, facilities of the industry are of small scale and commonly belong to the old outdated generation, the technological level is low and less uniform, leading to the limited product quality.

(2) Pre-conditions for the development of the steel industry

Main raw materials for steel production:

a) Iron ore

Our country has a significant potential in iron ore, with the total reserve of about 1.2 billion tonnes, surveyed reserve of over one billion tonnes, of which the reserve of industrial exploitation is 450 million tonnes, concentrated mostly in the three following big mines: Trai Cau, Tien Bo (Thai Nguyen), Quy Xuong (Lao Cai), Thach Khe (Ha Tinh) and some small mines in Cao Bang and Ha Giang (see Table 1).

Table 1: Geological reserves of major iron mines in Viet Nam

No.	Name of the mine	Type of ore	Fe content (%)	Geological reserve (million tonnes)	Exploitable reserve (million tonnes)
1	Thach Khe	Manhetit Mactit	~ 61	544.0	320.0
2	Quy Xuong	Limonit	~ 53	120.0	98.0
3	Trai Cau	Manhetit Limonit	~ 61-62 < 55	7.63	5.81
4	Tien Bo	Limonit	~ 40	22.3	NA
5	Cao Bang	Manhetit	~ 60	68.79	NA
6	Ha Giang	Manhetit Hematit	< 40	128.0	NA

Except Mo Cau iron mine exploited for 37 years to serve Thai Nguyen Iron and Steel Complex, other mines are still in the form of potential. At present, there are different opinions related to the assessment of the iron ore potential of Viet Nam but based on the results surveyed and studied domestically in combination with the studies carried out overseas on Thach Khe and Quy Xuong mines, it can be concluded that : The iron ore potential of Viet Nam is significant. Its quality is average, the exploitation and transportation conditions are unfavourable, but if rationally used, it can still be an important natural resource for the development of Viet Nam steel industry.

b) Rich coal:

Our rich coal potential is very small. To develop steel production according to the traditional technology, we should import rich coal to refine coke or to import coke for BF production.

c) Antraxit:

With high potential in antraxit, Viet Nam steel industry will have favourable conditions when studying to develop the new non-coke technology.

d) Natural gas:

With explored natural gas resources, part of them can be used for the steel industry to produce direct reduced ore (soft iron) as material for steel production with electric furnaces of medium and small scale.

e) Supporting materials:

Viet Nam have a rich resource of raw materials as supporting substances for pig-iron and steel production to meet immediate and long term demand by the industry.

f) Raw materials for the production of Ferro and fire-bricks:

Viet Nam has enough raw material to develop the production of Ferro and fire-bricks. However, due to the limitation of the ore quality and reserve. We can only produce Ferro and fire-bricks to meet common demands. To meet the demand for the production of alloyed steel, we still have to import high quality Ferro and fire-bricks.

g) Iron and steel scrap:

The domestic iron and steel scrap has plummeted, moreover, the collection possibility is very limited with 300,000 tonnes per year on average, meeting only 60% of the demand by existing electric furnaces. In the future, with a developed economy, scrap resources will increase but still not meet the demand for consumption.

2. Development concepts and targets

(1) Development concepts

Stemming from the status quo of the steel industry, the state of natural resources and based on the expected growth rate of the economy, the concepts and targets for the development of the steel industry in the 2001-2010 period are as follows:

- The steel industry always regards the service of domestic demand as its main task but step by step shifts from the model of import substitute both in respect of product quality and category to the model of import substitute combined with export to form an integration oriented steel industry. In addition to construction and civil steel products, the steel industry should produce hot rolling slabs, cold rolling slabs, zinc toles, special steel and part of alloyed steel on the basis of the formation of the closed combined steel complex based on domestic ore resources.
- Technology: Viet Nam steel industry should take two directions at the same time: to develop synchronously mini mills and closed combined steel complexes based on iron ore. In the initial stage, we should choose advanced, up-to-date technology of medium and small capacity, in accordance with the investment capability and complete the final stage to ensure quality and competitiveness of products. In the immediate period, we should choose traditional technology chains (blast furnace, blowing furnace - continuous foundry) in combination with the short technology (scrap/soft iron - electric furnace- continuous foundry) but suitable for the particular conditions of each region. Besides, we should rely on domestically available resources, such as antraxit, natural gas to choose an advanced non-coke metallurgy chain, which has been fully proved by practical

production and suitable for the conditions of Viet Nam.

- Investment: To encourage mostly domestic investment in combination with foreign co-operation in the form of joint-venture and technology transfer or equipment purchase with deferred payment.
- On the contrary with the 1991-2000 period which focused on the downstream development, in the 2001-2010 period, we should shift drastically to the upstream development, aimed at making most use of domestic natural resources to develop a sovereign and sustainable steel production industry.

(2) Development targets:

After 2000, besides construction and civil steel products, the steel industry will produce hot rolling slabs, cold rolling slabs, zinc-plated toles, special steel and soft iron material. We should boost billets production to narrow the gap between billets production and steel rolling. By 2005, the production capacity will increase by one million tonnes per year, meeting 75% of the demand.

By 2001, we set the target of producing 4.5-5 million tonnes of different products to meet 78% of the demand.

3. Strategic orientations for the development of the steel industry to 2010

(1) Steel demand forecast

Based on the growth rate of GDP, the demand for steel consumption in the past period, the growth rate of the steel output in the 1995-2000 period, the expected output through 2010, foreign forecasts and the development of AEAN countries as well as the estimation of Viet Nam steel market by JICA experts from Japan in 1997, we can forecast the demand for steel consumption in each period as follows:

- Through 2000, the average steel consumption per capita is 28.2 kg and this figure will go up to 46 kg and 65 kg in 2005 and 2010 respectively, equivalent to the total steel demand of 2.3-2.5 million tonnes in 2000, about 3.9 million tonnes in 2005 and 6.0 million tonnes in 2010.
- In Viet Nam, in the 1991-1997 period, the steel consumption increased by 25% per year on average. The growth rate is expected to increase by 10% per year in the 1998-2000 period, 10% per year in the 2001-2005 period and 9% per year in the 2006-2010 period.

(2) The development strategy and steps to be implemented

a) The 2001-2005 period

The primary task for this period is to strengthen potential and competitiveness to integrate and at the same time build domestic material base, aimed at developing a sustainable, efficient and sovereign steel industry.

- To rearrange and rationalise existing production units of VSC, boost intensive investment, upgrade and modernise facilities. To export and mobilise at most the available capacity, increase productivity, efficiency and quality of production. To guide the rearrangement of private steel production businesses, ensuring product quality and overcoming environmental pollution.
- To restore and develop Thai Nguyen Iron and Steel Corporation to a rationally optimal level, based on using iron ore in the North (Thai Nguyen, Cao Bang, Lao Cai).

At present, with the help of China, we are transforming existing equipment to put the steel billets production capacity up to 200,000 tonnes per year to supply the existing rolling mills. The implementation is to be completed in 2001.

Right from the beginning of 2001, we should carry out the feasibility study to expand and bring the capacity up to 500,000 tonnes per year or 1-1.5 million tonnes per year, on the basis of using mostly Quy Xa (Lao Cai) iron ore in combination with Cao Bang ore.

To study the possibility to produce low alloyed steel of high toughness in substitute for ordinary carbon steel in Thai Nguyen Iron and Steel Corporation.

The total investment capital is USD 450 million.

- To transform and expand production of Southern Iron and Steel Corporation. At present, its production is profitable since the billet price is low, high protection by the State and demand for construction steel doesn't require high quality. But in the future, its competitiveness will decrease due to the old facilities, high material consumption norms and in the event of high price of electricity, the production costs will be higher than the new mills'. Consequently, we should invest to upgrade and supplement old facilities in the old mills and step by step close the mills which are too backward, small and environmentally polluted. To build new mini mills according to short technology (electric furnace—LF - continuous foundry furnace—rolling) in the locations near to ports:
  + To build a square billets mill and a special port of Southern Steel Corporation in Phu My with an initial capacity 250,000 tonnes of square billets per year. The investment capital is USD 100 million. After 2005, we'll expand its capacity to 500,000 tonnes per year and build an up-to-date steel rolling mill, with a capacity of 300,000 tonnes per year.
  + To study possibility to build a direct reduced ore mill to supply raw material to the electric furnaces in lack of scrap steel, using natural gas and imported iron ore in the first stage and then shifting to using Thach Khe iron ore.
  + To build a cold rolling slabs mill in the South with a capacity of 200-250,000 tonnes per year. The investment capital is USD 100 million.
  + Right from the beginning of 2001, we should carry out the feasibility study on the construction of the closed combined steel complex, on the basis of Thach Khe iron ore. The

initial optimal capacity may be 2.5 million tonnes per year and then can be increased up to 4.5 million tonnes per year. The total investment capital, including the mining exploitation, is USD 3-5 billion (depending on the capacity). For the time being, we should invest USD 3 million for the feasibility study. If conditions are favourable with high feasibility, we can build a mine with a capacity of 3.5-5 million tonnes of ore per year before 2005. If started early, the complex can only roll out its products in 2009 at the earliest.

+ Closely linked to the closed combined complex project is the project for the construction of a hot rolling mill with the minimum capacity of 1.0 million tonnes per year. The construction is expected to begin in 2003 and will roll out products in 2005. Initially, when the upstream segment (pig-iron refinery—steel refinery—continuous foundry) is not completed yet, we'll have to import billets and slabs for rolling.

In parallel with the hot rolling slabs mill, we should study the construction of a cold rolling slabs mill with a capacity of 0.6-1 million tonnes per year, which will roll out products in 2006.

+ Also in this period, other economic sectors themselves will invest and put into operation the following projects:

- Nam Do Steel Company in Hai Phong with a capacity of 120,000 tonnes per year.
- Hai Phong Steel Trading Company Ltd. with a capacity of 170,000 tonnes per year.
- Vinafong 100% foreign invested company with a capacity of 230,000 tonnes per year.
- The 100% foreign invested Zinc Plated Tole Plant in Binh Duong with a capacity of 80,000 tonnes per year.

In addition, there exist numerous private steel rolling and post-rolling processing businesses, whose output has not been determined yet but estimated at 300,000 tonnes per year.

b) The 2006-2010 period

Based on the achievements made in the previous period, we should continue to boost investment to bring about the fundamental change qualitatively, build a steel industry on the basis of domestic natural resources and create a competitive position towards exporting part of its steel output.

The major target of this period is to begin the construction of the closed combined steel mill; expand Thai Nguyen Iron and Ore Corporation, bringing its capacity up to 500,000 tonnes per year in billets and rolling steel (depending on the feasibility, its capacity can be up to 1 million tonnes per year); increase the capacity of the Southern square billets mill up to 500,000 tonnes per year and the capacity of the rolling mill up to 500,000 tonnes per year; double the capacity of the cold rolling mill to 500,000 tonnes per year; continue to implement the hot and cold rolling slabs project in the closed combined steel complex.

We can develop some new projects. such as:

+ A special steel mill, producing alloyed steel and high quality steel for the manufacturing mechanical industry with a capacity of 500.000-1,000,000 tonnes per year. The investment capital is about USD 150 million.
+ The Vinakyoei billets mill joint-ventured with Japan with a capacity of 500,000 tonnes per year and its investment capital is USD 100 million.

In addition, the capacity of the private sector and households rolling and post-rolling processing can reach 500,000 tonnes per year by 2010.

The total investment capital:

To implement the ten-year strategy the steel industry needs approximately USD 4.8-5 billion, meaning USD 500 million per year on average, of which the investment capital for state-owned businesses is USD 3.7 billion and the rest is the FDI and other economic sectors.

Capital solution: Businesses themselves borrow capital with guarantee or support of the state from preferential credit sources or purchasing equipment with deferred payment. The proportion of foreign joint-venture will be reduced as much as possible.

Investment results

If successful, this strategy will form a balanced, sovereign and efficient steel industry and integration oriented. In our country, there will be developed three major steel production centres: Thai Nguyen Iron and Steel Complex in the North, the Combined Mill in Central Viet Nam and the Steel Centre of Southern Steel Corporation. This strategy takes bold steps to accelerate the upstream development in harmonised combination with the downstream development, aimed at overcoming the discrepancy between crude steel production and the **rolling steel**; between the ordinary construction steel and steel slabs, steel sheets and high quality alloyed steel.

Equipment demand

To carry out the strategy, in addition to transforming and upgrading existing mills, most projects need new investment in the up-to-date facilities and technologies never seen in Viet Nam. The major trend is to import complete equipment form abroad but we should try our best to manufacture the equipment and parts that can be made domestically through tenders.

Demand for human resources

The total direct workforce in the steel industry in 2010 is estimated at about 30-35,000, not much higher than present but requires to be trained and high skills. The modern steel industry is highly

automated, leading to the decrease in the number of workers and increase in the number of engineers and technicians. We should have a training program right now to meet the demand in the future.

Demand for infrastructure

Electricity: By 2010, the steel industry needs approximately 2 billion kWh per year.

Water supply: the demand is about 15 billion cubic metres per year.

Communication and Transport: This a great demand which is currently unmet by road and water transports and needs the co-ordination of several ministries and branches to solve.

Suggestions:

- The State should classify the steel industry into key industries and give it priority in the period of strengthening industrialisation. First, we should have an appropriate protection policy for this industry to develop and then integrate after other industries since its competitiveness is low.
- The State provides as much as possible preferential investment capital and creates favourable conditions for it to borrow capital from abroad. To provide working capital for the mills to operate.
- The State should have a preferential policy in respect of electricity price, gas price, fuel price and transport tariff for the steel industry.
- We should decide as soon as possible the policy for the construction of the closed combined mill with a capacity of 4.5-5 million tonnes per year since all the strategy will rely on it.

2 − 5

The Current Vietnamese Steel Industry and Its Challenges

Nozomu Kawabata

Tohoku University

Introduction

This paper consists of two parts. In Part 1, the current state of the steel industry in Viet Nam and the problems it is facing are analyzed. Part 2 comments on future production and investment plans from the aspect of technology policies. In the course of restructuring and investing, due consideration should be given to conventional problems and their lessons.

Viewing the Vietnamese steel industry in context of the Vietnamese economy as a whole reveals the following complexities.

First, from the viewpoint of macro-economy the necessity of developing the steel industry has increased. According to study results of phase 2 of Joint Viet Nam-Japan Research, the steel industry's ratio of imports to total demand stood at 0.8722-to-1, and the import inducting coefficient was 1.3915, the largest figures across all industries from 1989 to 1995.[1] Although the figures for the late 1990s are not available, they are estimated to be quite high. Accordingly, leaving the steel industry undeveloped is expected to have a strong negative effect on the country's trade balance as well.

Second, development of the steel industry is a part of corporate reform. The Viet Nam Steel Corporation (VSC), a state-owned enterprise (SOE), and their affiliated enterprises control the core of the industry. In addition, foreign affiliates and private companies have their own roles and challenges.

Third, steel industry in Viet Nam has two challenges in international economic integration: reinforcement of competitiveness and participation in the international division of labor. Due to inconsistencies in policies for the steel industry concerning trade and competition, it is doubtful whether the country can maintain and develop its competitiveness under the new trade structures such as AFTA (ASEAN Free Trade Area) and WTO (World Trade Organization).

As briefly described above, the Vietnamese steel industry is facing industrial development, common among developing countries, and restructuring of SOEs, common among marketizing economies. These issues also prevail in the Vietnamese economy as a whole.

The author assumes the following viewpoints in his analysis.

First, long-term competition in international economic integration should be envisaged. The author establishes a contrast between "competition" and the absence of competition in the centrally planned economy, and a contrast between "international competition" and domestic competition. "Long-term competition" is viewed in contrast to short-term rent-seeking or opportunistic behavior. International competition is important even when import substitution is aimed at because domestically manufactured products must compete with imported products in the domestic market.

---

[1] Hideki Imaoka and Koichi Ohno, Globalization Ka No Boeki Sangyo Seisaku (Trade and industrial policies under the globalization), in Shigeru Ishikawa and Yonosuke Hara eds., *Viet Nam No Sijokeizai Ka (Marketization of the Vietnamese Economy)*, Toyo Keizai Shinpo-sha, 1999, p.215 (Japanese).

Second, importance should be attached to a systematic introduction and diffusion of technologies. To this end a consistent policy is required. Both government agencies and the steel industry should exercise due caution to prevent fragmentation of technology and imbalance in production processes.

Third, both structural and historical limitations and the capabilities of institutions should be given attention. Development of the Vietnamese steel industry has been hampered by war-related damage and its low standing in international economy. However, we should not place the entire responsibility on these factors. The author would like to emphasize that the situation may undergo great change depending on the policies and design of institutions in the country.

Improvement of institutional capability suited to long-term competition, does not necessarily mean privatization or liberalization. Though it is certain that the vitality of the Vietnamese steel industry will be tested in the shift toward a market economy, privatization and liberalization are not always the single best choices in a specific phase. In this report, the author will explore the suitability of policies and institutions to long-term competition on a case-by-case basis.

Part 1. Current state of the Vietnamese steel industry

I. Historical background

The contemporary history of the Vietnamese steel industry can be broadly classified into before the unification of the South and North in 1975 and after that.[2]

Prior to 1975, steel industries in the South and North existed under different economic systems, and their technological characteristics differed as well.

In the North, construction of the Thai Nguyen integrated steelworks for production of long products started in 1959.[3] The site was near an inland iron ore mine. The initial target for crude steel production was 200,000 tons per year. At the outset, iron ore mine was developed and an iron-making division was set up. In 1963, No.1 blast furnace began operation. Eventually three mini blast furnaces were constructed, each with an internal volume of 100 cubic meters.

At that time, developed countries constructed blast furnaces with a volume of 700 to 1,700 cubic meters, while some developing countries relied on small-blast furnaces. Small furnaces in Viet Nam were designed and built with technology assistance from China. In the 1950s, China was pursuing an economic policy to mobilize the masses and utilize medium and small plants. As part of such efforts, a large number of small blast furnaces were constructed to utilize regional natural resources.[4] That technology was transferred to Viet

---

[2] Concerning the history, the relevant information was gained through interviews at VSC, TISCO, and SSC.

[3] As for construction of Thai Nguyen steelworks, refer to the following. Japan Economic Research Institute, *Indosina Fukko Kaihatsu no Houto (Ways to Reconstruct and Develop Indochina)*, 1973 (Japanese).

Nam. The location and technology of Thai Nguyen steelworks was selected with a view of utilizing the technology of socialist countries and domestic resources to develop the country's economy. It was a reasonable selection for the North in those days.

However, after the 1960s, changes in international relations and steelmaking technology brought difficulties to Thai Nguyen steelworks. Construction was delayed and production targets were lowered. Though details are not known, it is believed that blast furnace operations were in trouble, because the scientific bases in facility design and operation were lacking in the construction of mini blast furnaces. In China, many of them ended in failure. Furthermore, Amarican bombing seriously obstructed construction and operation. It took more than 15 years from the start of construction of Thai Nguyen steelworks until realizing the integrated production of iron and steel. In that period, the world's leading integrated steelworks set up large blast furnaces with volume exceeding 2,000 cubic meters. Also, the increasing portion of the long products was produced by electric arc furnace (EAF) mills in many countries, while technology at Thai Nguyen turned obsolete.

Meanwhile, in the South, capital from the overseas Chinese was used to build EAF mills in the late 1960s. These mills are situated near Saigon City and had EAFs with capacities of 5-15 ton/charge and long-product rolling mills with an annual production capacity of less than 50,000 tons. A system in which long products were produced at EAFs near the site of consumption was the new one that was introduced to the world steel industry after the 1960s. At that time, mills in the South enjoyed the benefits of relatively new steel technology transferred from Taiwan and Japan despite their small-scale facilities. Those mills were nationalized in 1975 due to the unification.

The years after 1975 can be divided into three periods. In the first period, from 1975 to 1978, the organization of production was arranged at Thai Nguyen Iron and Steel Corporation (TISCO) in the North and Southern Steel Corporation (SSC) which integrated nationalized enterprises in the South. The second period, from 1979 to 1989, was the industry's most difficult period, according to VSC, due to stagnation of steel production as well as the whole Vietnamese economy. In addition, difficulties arouse when the supply of bituminous coal to TISCO from China was suspended due to worsened diplomatic relations. Crude steel production in Viet Nam in 1989 totaled a mere 85,000 tons and consumption totaled only 194,000 tons.[5] The third period, after 1990, saw the establishment of VSC through integration of TISCO, SSC, trading companies and other related organizations. Since then, attempts at reform of the steel industry have continued.

Based on the above, two issues must be considered about the history of the Vietnamese steel industry.

First, industrialization was difficult in Viet Nam prior to Doi Moi reform, hindering steel production growth. Unlike other wartime economies or centrally planned economies, Viet Nam was unable to afford investments in the steel industry. Namely, the Vietnamese steel industry before Doi Moi was not developed even by

---

[4] Yoshiro Hoshino, *Gijutsu to Seiji (Technology and Politics; Contrast of the Technology Modernization between Japan and China)*, Nihon Hyoron-sha, 1993, Chapter 6-8 (Japanese).

[5] International Iron and Steel Institute (IISI), *Steel Statistical Yearbook*, Brussels, IISI, 1996, p.24, 143.

market needs or by the planned policy orientation to the heavy industry.

Second, the industry was undeveloped as a whole, but there were some differences between the North and South. Such differences have significance even today.

II. Basic structure of the Vietnamese steel industry

1. Supply-demand structure

Table 1 shows the supply-and-demand relationship in the steel industry in East Asian countries. The Vietnamese steel industry lags developed countries and other ASEAN countries in production and consumption of steel. However, the industry escaped severe damage during Asian monetary crisis and the growth in demand has continued.

Table 2 shows supply and demand in the Vietnamese steel industry. It indicates that production cannot keep pace with the growth in consumption of steel products and imports are increasing. Table 3 provides a breakdown of imported steel materials, with flat products being the main import. Apart from finished steel materials, the imports of billet, semi-finished product for long products, are increasing as shown in Table 4. Figure 1 shows a prediction of material flow estimated in the fall of 2000. As Tables 2 and 3 show, the production figure for 2000 is known but breakdown of demand is not. Accordingly, Figure 1 is considered to provide an approximate picture.

Two reasons for increased imports of flat products and billets are: i) production facilities that are somewhat concentrated on the downstream sector and ii) a limited product line. For iron-making, there are only two blast furnaces, each with a volume of 100 cubic meters and only one of which is in operation. The industry's steelmaking capacity totals 368,600 tons a year and rolling capacity is 2.6 million tons. However, steelmaking is based entirely on EAFs, while rolling mills produce only long products; there are no rolling mills producing flat products. Production capacity of galvanized sheets using imported flat product totals 332,000 tons a year, while the figure for welded pipes using flat products is 293, 000 tons a year.[6]

While the industry is dependent on imported flat products and billets, there is now an overproduction of long products and galvanized sheets. In 1999, long-product production reached 1.4 million tons out of an annual production capacity of 2.6 million tons, at an operating rate of only 53.8%. Production of galvanized sheets registered 120,000 tons out of a yearly production capacity of 333,000, at an operating rate of merely 36%.[7]

---

[6] VSC and Mr. Nobuyoshi Tanaka, JICA Expert. *Draft Final Report, The Feasibility Study on Installation of Steel Flat Product Mills (Phase1: F/S on Cold Rolling Mill) in The Socialist Republic of Viet Nam*, JICA, 2000 *(CRM F/S Report)*.

[7] VSC and Mr. Tanaka, JICA Expert.

2. *Steel production in three sectors*

The Vietnamese steel industry consists of three sectors: i) VSC and its affiliated state-owned enterprises; ii) joint ventures between foreign capital and VSC, or its affiliated enterprises; and iii) domestic companies not under VSC control. In addition, as of autumn 2000, there was one steel pipe company wholly owned by foreign capital that was constructing an additional rolling mill for long products.

Table 5 shows production levels at major enterprises. Output from joint ventures has exceeded VSC's since 1997.

2-1. VSC and affiliated enterprises

i) Outline of VSC

VSC is a SOE engaged in steel production and steel marketing. It was established in 1990 when major enterprises in the North and the South were integrated. It was reestablished and reorganized under Decision No. 225/TTg, dated April 29, 1995, of the Prime Minister, Decree No. 03/CP, dated January 25, 1996, and Business License No. 109612, dated February 5, 1996. VSC is among the 17 enterprises of the "91 General Corporation" under the direct control of the Prime Minister. The government controls the appointment of VSC executives and large-scale investments, while VSC controls its affiliated units. VSC and its units are required to maintain a self-supporting accounting system. Affiliated enterprises can set the product price by themselves, though VSC sometimes coordinates the ceiling and bottom price.

The organizational structure of VSC is illustrated in Fig. 2. VSC owns three manufacturing enterprises, eight trading enterprises and one R&D unit and training unit. Cevimetal is a trading enterprise, but it owns a rolling mill. The production facilities owned by VSC include two small blast furnaces, steel-making capacity of 368,600 tons and rolling capacity of 760,000 tons per year.[8] In addition, TISCO owns coal fields and an iron ore mine. In Viet Nam, VSC-affiliated enterprises exclusively own iron- and steel-making facilities. The following are characteristics and problems at the manufacturing enterprises.

ii) Production Problems

The first problem is outdated technology and equipment that is small-scale and obsolete. The standard size of equipment adequate for ordinary steel production is shown in Fig. 3. Production capacity of main equipment at TISCO, SSC, Da Nang Steel and Cevimetal does not satisfy the minimum scale required, dampening their productivity and economies of scale. For example, VSC-affiliated enterprises own 20 EAFs, but the largest has a production capacity of a mere 96,000 tons a year, while the others have a production capacity of less than 50,000 tons.[9] The volume of TISCO's each blast furnace is only 100 cubic meters, while standard furnaces in developed countries have a

[8] *Ibid.*

[9] *Ibid.*

volume of 2,000 cubic meters or more. In recent years, those with a volume exceeding 3,000 cubic meters have become the standard in the world.

Working conditions are often outdated. One example is the Cevimetal's rolling mill.[10] The new plant, built in 1996, is dependent on manual labor in rough rolling more than either TISCO or SSC. Cevimetal has two units of reversed-type rough rolling mills placed in a roll, and two billets are simultaneously extended to several meters by rough rolling. However, since there is only one intermediate-finishing rolling line, one of the two extended billets cannot be directly forwarded to the intermediate-finishing rolling line. Therefore, one of the billets must be moved in parallel. To accomplish this, several workers use tongs to draw in such billets toward their feet, a hazardous task. Although there is a mechanical conveyor carrying billets, it cannot make parallel transfers. In addition, workers wear sandals and sometimes kick a heated billet to correct its direction, also a dangerous task.

At other state-owned rolling enterprises, processes are comparatively automated. Roughly rolled billets are moved directly to an intermediate-finishing line moved on a conveyor. However, at some steelworks, billets are pushed into a rolling stand with tongs for rough rolling. Also, the bundling of hot wire rods shortly after rolling is done manually. Working conditions for these manual workers tend to be poor.[11]

The second problems are inconsistencies in the production process. This is the case particularly at TISCO.[12]

TISCO lies inland near an iron ore mine, offering easy access to raw materials. However, it is far from Ha Noi, the important consumption area of steel products, and Hai Phong, where raw materials from abroad are unloaded. Despite its convenient location for raw materials, TISCO is forced to purchase scrap and import billets since effective capacity of blast furnace is smaller than those of EAFs, and those of EAFs are smaller than those of continuous casting machines and rolling machines. Land transportation costs lead to higher costs. Also, at TISCO, pig iron produced by a blast furnace is cast entirely on casting floor as cold pig iron, removed from the die manually and melted again at a steel-making plant. The advantage of a blast furnace is that it allows molten iron to be placed in an oxygen furnace or EAF to raise thermal efficiency, a benefit unavailable to TISCO.[13]

SSC's location in the South, which accounts for 65% of domestic steel consumption, is not problematic.[14] However, as with TISCO, SSC's capacity for steelmaking is smaller than that for its

---

[10] Plant visit.

[11] Plant visit.

[12] Interviews and plant visit at TISCO.

[13] The problems are scheduled to be solved by an on-going rehabilitation program supported by China.

[14] *Final Report, Master Plan Study on the Development of Steel Industry in the Socialist Republic of Viet Nam*, JICA, 1998 *(Master Plan Report)* IV-15-1.

rolling, and thus it must import billets.

Third, there is a problem concerning operation methods. TISCO's coke rate (the quantity of coke required for producing one-ton of pig iron) is reported as 1.17 ton/ton. In Japan, the coal rate (the total of coke and pulverized coal) is 0.522 ton/ton. Thus, coke rate at TISCO is quite high.[15] It is due not only to obsolete equipment but the lack of a scientific knowledge in operation. In Shanxi province, China, a site of many small blast furnaces, coke rate of some furnaces was lowered as shown in Table 6, through operational assistance from Japanese engineers. Improvements were made in coke properties and control of raw material grain size, which required relatively small investments. For Viet Nam, as JICA is proposing quality improvement of ore and coke, there is ample possibility for improvement.[16] Also, scrap to be placed in EAF is not sufficiently selected, causing considerable rust. As a result, this adversely affects on product quality and electricity intensity. However, in the Vietnamese market, product quality seems not to be a major concern or an impediment in sales performance.[17]

iii) Existence of surplus workers

VSC considers that its affiliated companies are overstaffed, and it is trying to reduce work force mainly by not filling vacancies made by retirement.[18] VSC as a whole had 25,400 employees in 1997, and the number was reduced to about 18,700 persons in 1999, when VSC considered 6,500 persons were still surplus.

Overstaffing is particularly serious at TISCO. Under the centrally planned economy modeled after that of the former Soviet Union, various indirect and welfare divisions had been included at TISCO, leading to a bloated work force compared with its production capacity. In 1999, a hospital and school were moved to Thai Nguyen Province, bringing the number of employees down by 2,200 persons. In 2000, however, there were still 10,800 employees. In contrast, SSC has 4,000 employees, which is less than TISCO, with fewer non-production divisions, since the plants of SSC were established as a private company at first.

Due to problems with production processes and staffing, productivity of VSC-affiliated enterprise is extremely low. Production of steel products per capita in 1999 was 13.4 tons at TISCO, 68 tons at Da Nang Steel and 73 tons at SSC.[19] These contrast sharply with the corresponding figures at Nippon Steel Corporation, an integrated steel company in Japan, of 887 tons and at Kyoei Steel Ltd., an EAF mill in Japan, of 1,987 tons. The gap is obvious.[20]

---

[15] *Tekko Tokei Yoran (Steel Statistical Abstract)*, The Japan Iron and Steel Federation, 1998, p.126-127.

[16] *Master Plan Report*, II-2-2-3.

[17] Interviews at various enterprises.

[18] The description in this paragraph is based on interviews at VSC, TISCO and SSC by the Japanese members of Industry and Trade Group and the General Commentary Group.

[19] Calculated according to numerical figures obtained through interviews at various enterprises.

iv) Common features and differences among enterprises

VSC-affiliated businesses overall are facing serious production problems, while each company has its own unique set of challenges. The biggest ones at TISCO are related to technology and staffing, while Da Nang Steel and Cevimetal struggle with undersized plants in addition to technology problems. On the other hand, SSC enjoys comparatively fewer difficulties related to technology, location and staffing. The VSC group posted a profit of some USD 3.5 million in fiscal 1999. Interviews by Japanese members of Industry and Trade Group (JITG) at companies indicated that SSC was the biggest winner, while TISCO edged into the black. SSC also came out ahead in estimated operating rates in 1999 and 2000, with about 70-85% for electric arc furnaces and about 65% for rolling processes. The figures at TISCO were about 50% and about 60%, respectively. Also some SSC plants are operating at almost full capacity.[21] This data reflects the relatively strong competitiveness that SSC maintains among SOEs. However, precise judgment requires the effects of protective trade measures.

2-2. *Joint-venture companies with foreign capital*

Foreign-capital joint ventures are engaged in long product rolling and the manufacturing of welded pipes and galvanized sheets. They are not engaged in iron making or steel making. Long product rollers use imported billets, welded pipe manufacturers use hot coils, and galvanized sheet manufacturers use cold coils, respectively.

The total rolling capacity at the five enterprises engaged in production of bars and wire rods for construction is 910,000 tons.[22] Of these, Vinausteel, Natsteel Vina and Tay Do Steel own slightly small semi-continuous rolling mills and manufacture standard quality products. This is thought to reflect a strategy to offer low prices. Vina Kyoei and VSC-POSCO, meanwhile, own continuous rolling mills of standard scale in developed countries. Detailed information on VSC-POSCO is not known, but it is known that Vina Kyoei manufactures high-quality products using advanced equipment and pursues a strategy of premium prices. Comparisons of Vinausteel and Vina Kyoei follow.[23]

Vinausteel uses Taiwan-made semi-continuous rolling mills. Though numerical values are not available, the use of such rolling mills reduces the burden of depreciation and interest payments, according to an interview by JITG. Its rough rolling mill is the reverse type but requires no handling of billets by tongs and control tasks are operated in a pulpit. The rolling process is automated but bundling of bars after cooling is done by manual work. Billets are imported from Russia, China, Korea, Turkey and India. With a work force of 210 persons, the company realized a production level

[20] *Shin Nittetsu Gaido (Basic Facts about Nippon Steel)*, 2000, p.2, *Tekko Nenkan (Yearbook of the Steel Industry)*, Tekko Shinbun-sha, 1999, p.380, 474 (Japanese).

[21] Interviews at VSC and other enterprises.

[22] Production capacity is based on information provided by the VSC head office and JICA Expert Mr. Tanaka.

[23] Interviews and plant visits for Vinausteel and Vina Kyoei.

of 114,300 tons in 1999, or 544.3 tons per capita. Vinausteel's product prices are comparable to those of other companies.

Vina Kyoei products are priced higher than those of other companies in the South due to their high quality and corporate efforts to establish a reputation for the brand. There are several reasons for the high-quality products produced by Vina Kyoei. One rests in advanced production equipment. Japanese-made continuous rolling mills are used in Vina Kyoei. Rolling and bundling works are automated and the use of vertical- and horizontal-type rolling mills results in high productivity and high quality. Another reason lies in operation. Stable operations are secured through personnel trained in Japan. And another reason is the strict selection of raw materials. Billets imported from China and India are used, while the use of materials from Russia is avoided with the purpose of maintaining high quality and stable operation. Vina Kyoei does not automate some tasks because of lower labor costs in Viet Nam. However, it has only 180 employees, less than Vinausteel that has employees. Moving rate of employees in Vina Kyoei is low due to good working conditions. Production at Vina Kyoei in 1999 totaled 229,000 tons, or 1,272.2 tons per capita.

Joint-venture companies encounter various problems in availability and costs of infrastructure. One example is unstable electric power supply and high electricity rates. Concerned about the power supply, Vina Kyoei introduced a private electric generator despite the Phu My power plant at an adjacent site. The second problem is high distribution costs. Executives of Vinausteel cited high expenses in transporting materials from Hai Phong port to its plant.

SSSC and POSVINA, major manufacturers of galvanized sheets, are SSC-joint ventures with foreign capital. Each utilizes inexpensive equipment to manufacture standard products for construction. The production line at SSSC line was imported from Malaysia, while that at POSVINA is self-manufactured. It is assumed that both companies have low burdens in depreciation and interest payments. However, due to a lack of non-oxidation furnaces, they are unable to produce high-quality products for household electric appliances and automobiles. However, SSSC produces colored galvanized sheets and is making efforts to realize high added value.

In 1999, all joint-venture companies in rolling enjoyed profits and posted a total profit of USD 12.5 million, far exceeding the total of VSC-affiliated enterprises.[24] Their average plant-operating rate was 75.7%. Meanwhile, some manufacturers of steel pipes and galvanized sheets reported losses.

2-3 Enterprises unaffiliated with VSC

Enterprises with no VSC affiliation can be classified into four groups. The first group is comprised of wholly foreign-capital companies, to which only Vina Ta Phong belongs. The second groups are state-owned enterprises engaged in major business outside the steel industry. The third group comprises private small and medium-size companies that produce several thousand to tens of thousands of tons

[24] Hearing from executives of VSC and Mr. Tanaka, JICA Expert.

of steel products a year. The fourth group is companies in the petty home industry. In this section, enterprises in the latter three categories are discussed. They have held their positions in the long products market.

Entry by companies unaffiliated with VSC was triggered by suspended imports of steel from the former Soviet Union when it collapsed in the early 1990s.[25] Driven by increasing demand for steel, many companies invested in various types of furnaces and rolling machines. Thereafter, protected trade policies, described later in this report, served to expand their production.

Raw materials, used by companies in the above three groups, are cut scrap pieces or pencil ingots. Pencil ingots are made by casting scrap melted in induction furnaces.[26] These materials are rolled into small steel products at small rolling mills. Some companies are engaged in both melting and rolling, while others participate in one or the other. Some state-owned machine manufacturers own EAFs and long-product rolling mills. Also, some enterprises are engaged in rolling of imported billets or shearing of imported coils. Some rolling mills are large, operating at a capacity greater than 10,000 tons a year, while others are very small. At one petty plant, the author witnessed workers picking up materials with pinchers for reverse rolling to produce very small hoops. According to VSC, such businesses, in the North alone, had a rolling capacity of 288,500 tons in 1999.

Of these businesses, those that are state-owned have analyzing facilities and register product quality at agencies concerned. Meanwhile, private companies and the home industry do not have analyzing facilities and are less attentive to product quality. Highlighting the differences in product quality is the use of domestic scrap as raw material. Scrap is refined to clean steel in an EAF, but in an induction furnace, ingredients are not adjusted. The result is that steel products made mainly from cut scrap and pencil ingots tends to be poor in quality. According to VSC, of the 1.4 million tons of steel products used for domestic construction in 1999, 30% was substandard.[27] The poor durability and rusts of these substandard products also elicits concerns about the safety of construction works and buildings.

Smaller companies and the home industry in the Vietnamese steel industry have remained in business by offering low-priced products to small users. However, the technology in steelmaking and long-product rolling make these processes suited for economies of scale. As large mills increase, production and distribution systems are improved, products manufactured by small and petty companies will gradually lose competitiveness.

3. *Distribution of steel products*

Abolishment of the government's monopoly in the steel business paved the way for entry by many

---

[25] *Viet Nam News*, September 1, 2000.

[26] The description in this paragraph is according to VSC, JICA Expert Mr. Tanaka and visits to home industry.

[27] *Viet Nam News*, September 1, 2000.

distributors. However, foreign-affiliated trading companies may not engage in international trade, although they may open local offices.[28]

Given the country's centrally planned economy in the past, it is assumed that long-standing business ties continue between state-owned enterprises and major steel users. However, it is worth noting that under Doi Moi policy many small companies can be found engaged in business, and little shops marketing steel products line the streets in the cities of Ha Noi and Ho Chi Minh City.

Ex-factory is a standard practice in which customers hire a transport company to move products from plants' warehouses.

There are eight VSC-affiliated metal companies that do business in domestically produced as well as imported steel materials, while the ratio of imports has been increasing recently. In the central region, Cevimetal controls 50-75% of the market, dominating all billets to relatively large factories. In the south, HCM City Metal holds a 15% market share and a 70% share in the flat-product segment.[29] VSC-affiliated metal companies still have a significant role in product distribution.

However, we observed inconsistent practices among the metal companies.[30] For example, they prefer not to hold stock of imported billets in order to avoid risk, and therefore they cannot balance supply and demand of billet. Such practice is thought to be one reason behind sudden price increases for billets when the market is brisk. On the other hand, the metal companies remain as agencies of planned government policies to stabilize the market. They sell products in stock even if the sales yield no profit when such a move will help stabilize the market.

According to several executives of metal companies, the most serious problem facing corporate management are 30-day credit given to customers that frequently result in payment delays. Loose credit between companies, a common phenomenon in the transitional economies, impairs financial discipline and masks true corporate performance.

The widespread sales of substandard steel products reflect problems in the country's steel market. Among the reasons attributed to such sales is the no-availability of standard products to promptly meet customer demand. VSC admits that products of home industry satisfy demand for low prices as well as varying types and quantities of materials. Also, both producers and customers make their deals based on price rather than quality. Some companies have been found producing substandard products with pirated trademarks of SOEs, while customers, unfamiliar with product quality, select their purchases based on price. And unsatisfactory storage conditions have been found at some steel trading companies.[31]

---

[28] Trade Agreement Administration Division, the Ministry of International Trade and Industry ed., *2000 Ban Hukosei Boeki Hokokusho (1999 Report on the WTO Consistency of Trade Policy by Major Trading Partners)*, Tsusyo Sangyo Chosa-kai, 2000, p.453 (Japanese).

[29] Interviews at metal companies.

[30] Interviews at metal companies.

[31] Visit to inventory yard of a metal company.

Currently, the government does not control activities of private companies and the home industry. From 1999, however, it began requiring companies making steel products for construction to comply with product-quality standards, obligating them to register product quality and attach government-issued labels to their products. Still, VSC forecasts a further increase in sales of substandard steel materials.[32]

As the measure to cope with fragile distribution mechanisms for steel products, joint-venture companies are seeking to build long-term relationships with reliable distributors. Vina Kyoei takes designated distributor system and aims to establish a solid brand image, while assisting the management of the distributors. Thanks to such efforts, some customers specifically demand Vina Kyoei's products. Vina Kyoei is aiming to become the company like "Honda" which has established itself as a leading brand in Viet Nam's motorcycle industry.[33]

4. Summary

An overview of production and distribution in the Vietnamese steel industry reveals a flow of goods that is narrow and uneven with small-scale imbalanced facilities. Also, stagnation is seen in the full process from purchase of raw materials to sales of products. The size of business in each process is small. In short, mass production system is not established. The situation is serious for a industry in need of economies of scale. A close look at the industry, meanwhile, shows conditions that are not uniform. For example, technological compositions vary considerably among SOEs, and some of joint -venture companies have excellent mills. Concrete conditions such as these should be taken into consideration in evaluating and predicting the industry's survivability and future development.

III. Protectionism and nurturing policies for the steel industry

1. Historical and structural restrictions

Current states that the various types of small equipment are flooding, and that billets and flat products are in short supply, are in part due to historical and structural restrictions. The reasons behind the selection of TISCO's technology and location as well as the challenges it now faces in operation can be understood only in context of the country's economic development under the Cold War and damage of aerial bombardment. And SOEs' overstaffing is a negative legacy from the nation's past as a centrally planned economy. In short, difficulties at SOEs reflect the historical condition before the Doi Moi era. Also, it is important to understand the impact of the Asian financial crisis. Reform efforts were slowed and plans for investments in new equipment in the 1990s were never realized due to difficulty in raising funds.

Although these conditions should be taken into account, the role of the government's protectionist

---

[32] *Viet Nam News*, September 1, 2000.

[33] Interview at Vina Kyoei.

policies and corporate behavior too should be pointed out. These will be discussed in the following sections.

2. *Relationship between policies in trade and competition*

2-1 Protection of domestic long product market

The Vietnamese government is currently protecting the domestic steel industry through import restrictions and tariff rates of 30 to 40% on seven steel items, including bars of a certain size, wire rods, small angles, galvanized welded pipes and galvanized sheets, all of which are produced domestically. Tariff rates for hot coils and cold rolled sheets, which are not manufactured domestically, are 0-3%, and that for billets, required by many long product mills, stands at 3%.

Let us look at how competition in long products was fueled or not fueled by government policies in trade and competition. Imports of long products for construction have been prohibited since 1997, when Russian-made imported products were offered at extremely low prices. Following the collapse of the former Soviet Union, the Russian steel industry saw demand plummet. To prevent massive unemployment, the steel industry has continued operation and exported large quantities of product in the latter half of 1990s. Stricken by chaos and unable to fulfill its debts, Russian industry engaged in barter trade domestically and, exported products with no profits for cash and foreign currency. Ukraine faced a similar situation.[34] Quality, packaging and delivery of steel products from the two countries was rated lowest among the world. Actions by them caused trade friction around the world. The steel industry was hit with the largest number of dumping investigations of all industries.[35] Fearing that cheap imports would hurt its domestic industry, the Vietnamese government understandably adopted protective trade steps.

However, the issue was complicated by the fact that these measures of import prohibition did not spell out a time frame. Following Viet Nam's accession in 1995 to ASEAN Free Trade Area (AFTA) and the Common Effective Preferential Tariff (CEPT), the Vietnamese government is required to cut tax barriers on various products, including steel, by 2006. However, relationship between import prohibition and time limit for CEPT is not clearly explained even in 2000. Such policies gave incentives to enterprises to expand their production neglecting international competition. As there were different behavior patterns among business sectors, the author explores each of them.

2-2 Excessive growth of small and medium-size private companies and home industry

The domestic market for long products was on one hand protected from international competition

---

[34] U.S. Department of Commerce, *Global Steel Trade: Structural Problems and Future Solutions*, July 2000, pp. 40-64. (http:www.ita.doc.gov/media /steelreport726.htm). *Geppo (Monthly Report)*, Japan Iron & Steel Exporters' Association, November 1999, *Joho (Information)*, Japan Iron & Steel Exporters' Association, April 2000 (Japanese).

[35] *Ibid.*

due to the government's policies and on the other hand was liberalized to new entrants under Doi Moi reform. Private companies did not have the financial and technological capabilities for investment in rolling mills that met minimum efficient scale. They were small private companies and petty home industry that were motivated by high prices to increase investment and production. The result was an oversupply and flood of substandard products. Neither protectionism itself nor profit-seeking action itself can be blamed for that result. Rather, to be blamed is inconsistency in policies that invited opportunistic behavior in pursuit of short-term profits and led to the expansion of companies with no long-term possibilities. A similar experience was seen in markets for galvanized sheets and welded pipes.

2-3 Investment policies of state-owned enterprises

Da Nang Steel and Cevimetal set up their mills in 1992 and 1996, respectively. As mentioned, employees are found engaging in hazardous work at extremely small facilities. Though details concerning investment decisions are not known, it can be safely assumed that investments were made based on the view that mills could be set up in the central region to satisfy local demand rather than from a view of international competition.

The division of labor between two enterprises is also open to question. Da Nang Steel had two very small EAF units, with a capacity of 1.5 tons/charge and one wire rod mill. Cevimetal, meanwhile, was started as a trading enterprise. If a bar rolling mill was to be constructed, it would have been desirable to integrate it with Da Nang Steel's EAF mills. Combining a steelmaking plant and two types of rolling mills could have created economies of scale. In reality, however, Cevimetal constructed its rolling plant at different site from Da Nang Steel's. This decision, it is said, was made to smooth the reassignment of surplus employees at Cevimetal.[36] As a result two plants are located separately and managed independently. Though Da Nang Steel plans to expand its equipment, it cannot solve a problem of a small-scale operation.[37]

2-4 Incentives for foreign capital investment

The Vietnamese government offers various incentive schemes to attract foreign capital, including tax incentives in the steel industry. Aiming to expand in the industry, VSC is participating in joint ventures with foreign capital. VSC reportedly stepped forward to propose to the government that tariffs on billets, the material for long-product rolling, be reduced from 5% to 3%. Competition between joint-venture companies and state-owned enterprises in the South has disciplined both sectors to reduce costs.

However, inconsistencies are observed in the incentive policies for foreign capital. Many executives point to the high costs for electricity and harbor loading and unloading that foreign-affiliated companies

[36] Interviews at VSC-affiliated enterprises.

[37] Interview at Da Nang Steel.

pay. While domestic enterprises pay a loading/unloading rate of USD 1.3 per ton at Hai Phong harbor, joint ventures pay USD 4.5 dollars/ton.[38] This is a heavy burden on joint-venture companies located in Hai Phong.

Joint-venture companies also face problems stemming from policies combining international trade barrier and domestic free market entry. A number of joint-venture companies began production between 1995 and 1997. It is believed that protective measures raised their operating rates and facilitated startup of full-scale operations. Production at joint-venture companies rose from 353,600 tons in 1996 to 484,500 tons in 1997, surpassing that at state-owned enterprises. (Table 5)

Thereafter, the number of venture companies that were licensed and set up rolling mills grew, while oversupply was appearing. In 2000, rolling capacity reached 2.6 million tons, 500,000 tons of which was from new plants built by foreign-affiliated companies during 2000. The mills constructed by foreign affiliates have become the factor of oversupply. VSC predicts that rolling capacity in 2001 will exceed 3 million tons.[39] However, it predicts that consumption of long products will not hit 3 million tons until 2010. Moreover, it is predicted that consumption of long products in 2006, the limit for CEPT, will total 2.29 million tons, of which about 200,000 tons are large section steel and other products that are not produced in Viet Nam and thus imported. Accordingly, the market size for domestic long-product rolling enterprises is limited to 2.09 million tons. Continued over-capacity until 2006 may hamper development of the Vietnamese steel industry. The larger the excess capacity means the larger effects on regional economy and employment when some are weeded out.

3. *Competitiveness of existing enterprises*

How have import prohibitions and liberalization affected Viet Nam's steel industry's competitiveness? Can existing EAF mills and long-product rolling mills survive if tariffs on steel materials are cut to below 5 percent by 2006?

A critical matter is the drop in prices of bars and wire rods each year due to oversupply, regardless of import prohibition. Domestic prices in 2000 were around USD 275-288, down from USD 341 in 1997. According to VSC, the price is 10-15% higher than Russia's export prices but only about 5% higher than export prices from Japan and South Korea.[40] Thus it is expected that effects of protectionist measures are being reduced for good or bad.

The enterprises that can post profits at current price levels are joint-ventures of long-product rolling and SSC. Joint-venture companies are seen capable of maintaining business performance based on their

---

[38] *Cold Rolling F/S Report*, VIII-5-15.

[39] South East Asian Iron and Steel Institute (SEAISI), *Newsletter*, January 16, 2001. http:www.seaisi.org/news-detail.asp?ID=419&y=2001&m=2 (accessed on February 13, 2001)

[40] *Viet Nam News*, October 25, 2000. Findings from interviews at enterprises agree with this statement.

relatively advanced technology and marketing abilities. Also, it appears that SSC rationalization efforts, corresponding with market trends, are seeing positive results. SSC recently saw improvements in its scrap rate and consumption rates of electricity and electrodes. It is assumed that other SOEs are less competitive than SSC due to production problems and excessive work forces.

Assuming that Japan and South Korea prices can be considered to international prices and that Vietnamese enterprises can attain the same pace of rationalization as in the two countries, joint-venture companies and SSC could maintain international competitiveness with a 5% tariff rate. However, other SOEs will require large-scale restructuring. Also, the lives of most companies will be threatened if domestic market is affected by low-priced products from Russia or lasting oversupply. Some managers pessimistically predicted that Russian and Taiwanese companies will offer around USD 220/ton.

SOEs are seeking production expansion. TISCO and SSC management hold the view that operating expenses can be reduced through enhanced in-house production of billets since domestically produced billets are cheaper than imported ones.[41] On the other hand, management of joint-venture companies believes that EAF construction is unprofitable in view of unstable electricity supplies and high rates. Interviews by JITG indicate that abolishment of the dual price system of electricity would spur incentive among joint-venture companies to install EAFs, with the same electricity rates as the current rates for SOEs made available.

Though somewhat rough, the above analysis could serve as a warning against overly pessimistic or optimistic views. In addition, manufacturers of galvanized sheets and welded pipes, sectors in which even some joint-venture companies are recording deficits, are facing even more difficult conditions. Separate analyses are necessary for these sectors. In short, a general discussion on the merits and demerits of protection and liberalization serves no purpose. Rather, a discussion based on the concrete conditions in the steel industry is necessary.

4. *Problems and prospects of protectionist and nurturing policies*

4-1 Problems of import prohibition policies

Current industrial policies concerning competition in the steel industry are aimed at nurturing the industry through initiatives of healthy companies, while protecting them from excessive price falls. Their positive effects can be seen in the startup of joint ventures and rationalization at SSC. However, unexpected developments such as expansion by businesses with no long-term possibility also were seen.

The reason for this is attributed not to protectionism itself but rather the form it took — a uniform prohibition of imports. It was adopted presumably because the country had not prepared trade laws. Even in international economic integration, protective measures may be unavoidable against some

[41] Interviews at TISCO and SSC.

unfair trade practices or serious damage to domestic industries. However, it is necessary that such measures must specify targets and periods as well as methods.

Toward this end, establishment of trade laws is necessary. Professor Kimura and Professor Ohno analyze this issue in their papers. It should be noted here that it is important to distinguish protective actions designed to nurture an industry from those as a temporary means adopted to protect an industry from a huge damage. It is appropriate for the former to continue over a specific period while the latter must be discontinued when the threat of great damage has abated.

4-2 Two directions for policy change

Current policies regarding import prohibitions no longer serve definite purposes, lead to overproduction and counter the goals of CEPT. They should be remedied. Such remedies can take two directions.

First, measures to restrict opportunistic entry should be done by forcing strict quality-control systems and controlling entry, the latter now being attempted by the government. All projects to produce long-products require approval from the prime minister as of January 2001.[42] However, such policies can have a limited effect. Though a quality-control system is essential for a sound market, it will take time for the Vietnamese industry to fully adopt and implement the system. Also, while restricting market entry protects existing healthy companies from failing together due to overproduction, it also protects existing low-efficiency companies. In particular, the effect cannot be ignored in the North where TISCO is situated. In addition, according to JITG's interviews, neither VSC-affiliated enterprises nor joint-venture companies have rationalization plans preparing for reductions of tariffs in 2006. And it is easily assumed that small and petty businesses do not either. If entry restrictions are implemented and protection continues, many businesses will lose their incentive to prepare for international competition.

Accordingly, policies to reduce trade barriers are necessary. This is the second direction. Compared to East Asian countries that industrialized in the past, however, Viet Nam is under far greater pressure for liberalization. In addition, the Vietnamese steel industry's foundation in technology is weak. Therefore, the extent of lifting protection and the relevant schedule for the country may be different from full compliance with the CEPT deadline. In such a case, negotiation with AFTA member states will be necessitated.

Even so, a large reduction cannot be avoided and some schedules targeting the year 2006 are necessary. The point is to announce publicly on policies with time frames. Namely, the Sun Set System to announce the extent and timing to reduce protection should be adopted. A vague approach by the government and VSC only encourages enterprises to delay preparation for rationalization plans. Notification to local enterprises on the extent that protection is reduced can change the situations.

[42] *Viet Nam News*, October 25, 2000. SEAISI, *Newsletter*, January 16, 2001.

Opportunistic entry will be controlled without any monitoring, and enterprises will be forced to formulate rationalization plans. Some VSC-affiliated companies may find that a challenge, but sooner restructuring will return greater profits later, with smaller sacrifice.

Under current conditions, a combination of these measures may be realistic. However, progress has been made only in restricting entry, leading negative secondary effects. Prompt action by the government and VSC for the reduction of trade barriers is expected.

IV. Conclusion of Part 1

As the conclusion of Part 1, we would like to call attention again to the challenges the Vietnamese steel industry is facing.

When asked about the problems in the Vietnamese steel industry, many executives and managers in JITG's interviews cited old equipment and a shortage of funds. It may be true that historical and structural restrictions have made access to technology and funds difficult. However, as analysis of this report shows, these are not the only source of the problems facing the industry. Many rest in industry-related policies and institutions as well as the capabilities of the government and enterprises.

On the other hand, economists from advanced countries are prone to arguing that the flaws in a centrally planned economy and ill effects of trade protectionism cause Viet Nam's problems. In fact, Viet Nam is basically moving toward market economy and participation in international economic integration. A policy that does not regard these will fail. However, it is not true that the farther privatization and liberalization are implemented, the better results are. Viet Nam must strive to carefully achieve a balance between a plan and market system as well as protected and free trade. Minor failure in balance could lead to a failure in coordination.

Future investment plans should take into account these factors. If indeed old equipment and shortage of funds are the major source of the problems, then such problems can be overcome when better technologies and funds become available. If the problems are rooted in vestiges of centralized plans and protective measures, privatization and laissez-faire policy will resolve the problems. However, both suppositions are too simple. Concrete measures should be formulated, taking into account the factors that have determined the progress of the steel industry.

Part 1 analyzed problems mainly in existing steel enterprises and the long-product market. In Part 2, the author shall discuss the master plan for developing the Vietnamese steel industry through measures such as substituting increasing imports of billets and flat products with domestic products.

Part 2 Master plan for the Vietnamese steel industry

I. Investment plan under international economic integration

1. The steel industry in Viet Nam's industrialization strategy

VSC has submitted a master plan centered on investments up to 2010 to the government. The process of revisions continues while the plan still lacks details on many points. The author will analyze its contents, including planned numerical figures submitted in October 2000, supplemented by his own assumptions.

Before discussing the plan, it is helpful to look at the importance of the steel industry's development as part of the nation's overall industrial development.

Economists who study market economy hold diverse opinions about industrial policies. However, opinions about policies in a market economy cannot be directly applied to Viet Nam since SOEs still occupy a considerable share in the country's national economy. And in Viet Nam, overall privatization will not be achieved soon. Toward industry development in the foreseeable future, the government will prepare an overall plan and commit resource distribution. For the present, it is necessary for the study to assume that the government will pursue industrial development policies, while also keeping watching the growth of privatization and initiatives at private companies.

One problem plaguing Viet Nam's industrial development is the lack of an overall plan by the government despite its stated commitment to such development. There has been little study of individual industries or related policy-making. This situation, which Professor Ohno has repeatedly pointed out, should be remedied quickly.

Now there are no reasons for the Vietnamese government to give special favors to the steel industry. Presently it has no policy of extending favorable treatment to the capital goods industry. Such treatment is not recommended in the Joint Viet Nam-Japan Research, either.[43] On the other hand, there is no reason to treat the steel industry with indifference. As seen in Part 1, despite encountering problems along the way, Viet Nam has some experience of operation in the steel industry. Its competitiveness is weak but not desperate. And there are reasons to nurture the steel industry from a viewpoint of the effects on the balance of trade. In addition, the master plan for the steel industry reflects an understanding of the industry's realities and is the most comprehensive plan of any for capital-intensive industries in Viet Nam, thanks in part to assistance from JICA experts. Viet Nam is urged to continue developing its planning and management capabilities.

---

[43] Shigeru Ishikawa, Six Years of JVJR and the 7th Five-Year Plan, *Viet Nam-Japan Joint Research Project: Workshop on Economic Development Policy*, Japan International Cooperation Agency and Ministry of Planning and Investment, The Socialist Republic of Viet Nam, Ha Noi, 8-9 December, 2000, p.4

Although the steel industry should not be supported at the expense of other industries, it should be supported moderately like other industries.

2. *Issues for discussion*

The VSC master plan outlines three scenarios based on varying timetables for the construction of integrated steelworks. The scerario with iron-making and steel-making operations of the integrated steelworks scheduled to begin in 2010 is known as the "high case," in 2012 as the "base case" and thereafter as the "low case." Meeting the high case with the 2010 target is extremely difficult from the viewpoint of funding and technology as well as the government's view that does not favor the industry's development as the top priority. Thus the author will focus on the base and low cases in this study.

Tables 7 and 8 show planned construction in the base and low cases. Tables 9 and 10 predict trends in demand, production and imports. Figures 4, 5 and 6 indicate flow of materials in 2005, 2010, and 2015 respectively, according to the base case. Figures 7 and 8 show flow of materials in 2005 and 2010, respectively, according to the low case. The intention in these two scenarios is to partially substitute imports, assuming no change in exports. VSC has no aggressive export strategy other than export to Laos and Cambodia.[44] The scenarios do not specify who will run new factories, while VSC-affiliated enterprises or joint ventures between VSC and foreign companies are assumed.

The JITG held talks on investment projects with Vietnamese members, VSC managers, JICA experts, an F/S team on cold rolling and researchers at National Economic University (NEU) and Polytechnic University. The following four issues have been discussed at these meetings:

The foremost issue is the schedule for construction of an integrated steelworks. The view of some Vietnamese members is that it should be according to the high or base case, while some Vietnamese members and most of Japanese members believe that the low case is suitable.

The second issue is utilization of mineral resources in Viet Nam. Vietnamese members believe that the Thach Khe mine should be developed to utilize its iron ore. Japanese members believe that the use of the iron ore should be limited to supplementary use. However, both sides agree that a thorough study of the mine is necessary.

The third issue concerns the amount of capital investment for TISCO. There are various views among the Vietnamese members. The Japanese view is that investment should be kept to a minimum.

The fourth issue concerns policies on trade and competition. There is a consensus among all members that the country should take steps toward trade liberalization under international economic integration. However, both sides have not exchanged views on specific policies.

---

[44] *Viet Nam News*,October 25, 2000

3. *Analytical viewpoints*

The author does not have the capacity to comment on all of these matters. In this section, he will comment mainly on technology policies. For financial issues and trade policies, please refer to papers by Professors Ohno and Kimura. The author analyzes technology policies from the following aspects.[45]

The Vietnamese steel industry will face three major problems in construction of facilities.

First, there are the constraints arising from relationships with other countries. Those constraints make acquiring managerial resources such as funding, technology and raw materials difficult. Since the abandonment of colonialism and the end of the Cold War, it has become much easier to overcome political barriers to gain access to managerial resources around the world. However, the situation remains unfavorable to developing countries, where the economies give rise to struggles in fund-raising for projects, particularly large ones. The lower the industrial development level, the more difficult the situations are. Multinational companies or international financial institutions may impose conditions that are unfavorable to developing countries. Adversely they may offer plants and equipment at lower prices or decrease interest rates depending on the economic trend in a developed country.

Second, there are historical constraints. The current systems and policies have been influenced by past problems such as the American-Vietnamese War and the failures of a centrally planned economy. A process industry such as the steel industry trends to suffer serious hysteresis as a result of past investment strategies, location selection or product selection.

Third, the country must improve national and local institutional capabilities to acquire funding, technology and raw materials, and convert them into consistent production processes. In steel industry, production processes must enjoy economies of scale. It is critical to ensure a smooth flow of processes, including the selection of technology, location and configuration of equipment, from mine to the product market. To ensure such flow, enterprises need not only plants and equipment but also operating techniques, management skills and marketing methodologies. Technology does not work without human factors.

Changing the first and second conditions described above is not easy. However, institutional capability can change if the government, enterprises and society take the appropriate measures. The author has already discussed problems in the domestic systems and policies in part 1. Understanding these problems is necessary to carry out reforms. In short, they are important for the development of the steel industry to acquire managerial resources and convert them into consistent production processes, with an understanding of those structural and historical constraints.

In the following chapters, the author will make comments on the contents of the plan focusing on

---

[45] Refer to Anthony P. D'Costa, *The Global Restructuring of the Steel Industry: Innovations, Institutions and Industrial Change*, London and New York, Routledge, 1999. And refer to the following review article for the author's opinion to this book. *Ajia Keizai (Asian Economy)*, Institute of Developing Economies, Japan External Trade Organization, June 2000 (Japanese).