HCMC MECHANICAL ENGINEERING SECTOR NEEDS MODERNIZING

by MEcon NGUYỄN QUỐC TÒNG

I. TECHNOLOGY LEVEL OF HCMC MECHANICAL ENGINEERING SECTOR

We have conducted an initial survey on 58 mechanical enginneering establishments located in HCMC in the two periods 1986-1990 and 1990-1997 in 5 economic sectors (state businesses, limited liability companies; private firms; cooperatives and production team; individuals and households). The results are presented in the following table:

Forms of business	Machinery percentage (%)		
	Manual	Mechanical and electrical	Semi-automatic and fully - automatic
State firm	35.5	36.9	27.6
Limited company	28.2	50.0	21.8
Private firm	38.2	52.7	9.1
Household	45.8	50.0	4.2
Cooperative	56.8	36.2	7.0
Total	40.9	45.16	13.9

These figures indicated reality of the current city mechanical engineering sector. The factories under the Ministry of Industry top the list by capacity and scale, representing 27.6% of modern equipment. The modern equipment of total plants in the five economic sectors reaches only 13.9%, a too low rate as compared with requirements. This shows there need be strong and concrete measures from the macro level to speed up the process of industrialization and modernization of the mechanical engineering sector, a key sector of the economy.

In short, the sector has following features:

- Until now, the sector has manufactured over 500 categories of machinery, equipment and components. The remarkable products include 6-50 HP diesel engines; BS-12 HP traction-engines; various kinds of pumps with a capacity of 8,000 m3 per hour; 75-Kw electricity engines; 200-Kw power generators; 1,000-Kw hydropower turbines, machine tools (cutting, shaping, milling and drilling machines); 400-tonne screw express; industrial refrigerators, train wagons, autos, 5,000-DWT vessels; transformers; switchboards; equipment processing food and foodstuff such as sugarcane (1,500 tonne per day); instant noodles, rice polishing; silk making; construction; transport; irrigation; electricity...meeting around 25% the local consumption (according to the evaluation of the Ministries of Science, Technology and Environment and of Industry). Some products have been exported to regional countries such as Malaysia, Philippines, Myanmar, Taiwan, Pakistan and Iraq...However, the export value is not yet large and not in line with the country's potentials.

- The city labor productivity is though higher than other localities, but it equals only 1/5 of that in China, 1/20 in Russia and 20-25 times lower than that in West European developed countries. The quality of the product is 30-40% lower than the foreign one of the same kind (according to the Ministry of Industry's assessment in 1996). The processing precision is 10 times far behind developed countries.

- Following the data from individual survey and reports of the whole Vietnam's mechanical engineering sector, the ratio of errors is 2-5 times higher than the world's average, but only 45% of factories can obtain these rates. The utility rate of materials reaches only 0.4-0.54 while this figure is between 0.68 and 0.73 in Russia; and 0.75-0.85 in the U.S.; and the material wastage rate is rather high.

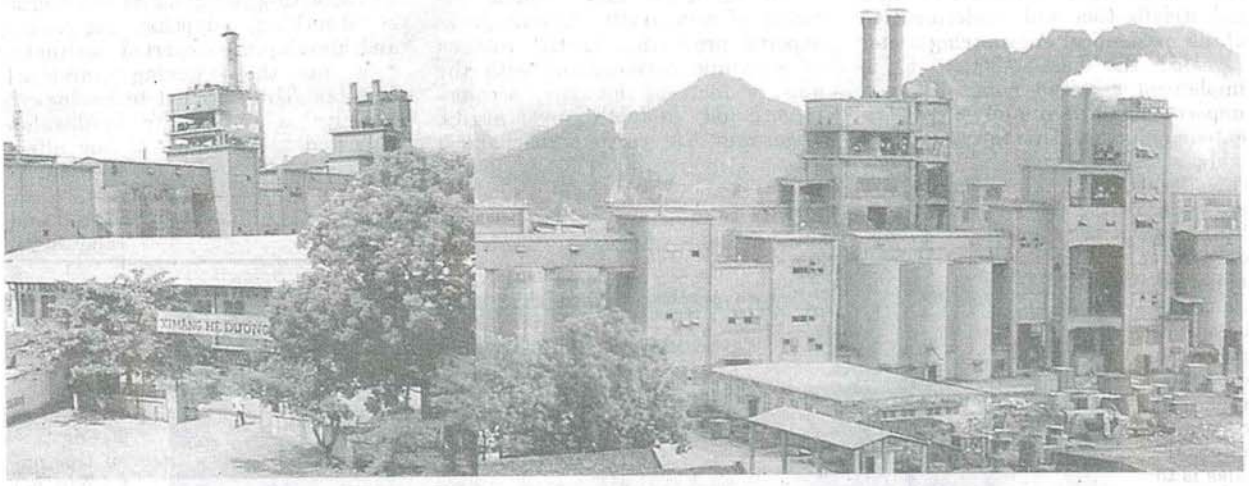
- The sector is incapable to make ingots in large form (casting, forging), complicate shape (turbine axe). The sector's return on investment remains too low, one đồng of capital cannot generate one đồng of product. As a result, the sector's development slows down.

- The development of the mechanical engineering sector has not yet been associated with the country's and the city's reality. The plans are numerous but they lack combination and cooperation, so the development strategy and inter-sector targets have not come into being. The impact of the sector on others in the economy is meager.

- The sector receives less and scattered investment in technical and material infrastructures, its facilities are poor, so it cannot have good effects on other sectors in the economy.

- The sector structure is not reasonable since the fraction of repairing factories exceeds that of manufacturing ones. The size of these two kinds is inappropriate. The distribution of sources between central and local units is a great paradox. Therefore, their combined strength have not been fully exploited with a view to expanding the sector, diversifying products and gaining more market shares.

- The sector's material infrastructures have taken shape and operated for tens of years with



obsolete equipment and machinery which lack uniform innovation. The technology turns backward, materials are wasted. The utility and durability of products are low, so they are not competitive on the market. Among the city mechanical engineering technologies, the weakest are technologies making ingots, casting and forging, thermal metallurgy and purely processing.

- The sector management apparatus is cumbersome, not effective, slow in making policies and strategies for the sector development, consequently it cannot yet create incentives to speed up the sector.

II. CRITERIA FOR TECHNOLOGY SELECTION TO MODERNIZE THE SECTOR

In the trend of rapid and vivid development of the current scientific and technological revolution, developed countries have to adjust and renovate their economy, transfer investment capital to foreign countries and export technologies to developing countries. In addition, the newly industrialized countries also restructure their industry to meet the development requirements. They also take part in the export of technologies. As a result, the market of technologies is abundant, Vietnam can be offered favorable conditions to get access to modern technologies.

Besides its plentiful natural resources, Vietnam has many advantages of labor force with cheap price and convenient geographic location. Here is an intersection of the two civilizations, if Vietnam possesses good capability of absorption, creates a good investment environment and builds an internal power, its shortage of capital and technologies is no problem to the mechanical engineering sector. Certainly, to prevent from becoming "eternal debtor" or "technological rubbish dump", the sector must find an extremely wise way to approach.

However, the history also proved in spite of low starting point, if the sector devises proper solutions, it can skip intermediate stages to enter the stage of advanced technologies with the aim to accelerate the economic growth and catch up with the world's trend. In such a view, the sector should shift from a subsidized stage to a new one with selected technologies of CAD/CAM-CAD/CAM CIMATRON (specialized system for mechanical designing and processing with high technologies). By doing so, the mechanical engineering sector can become a dynamic to speed up the national industrialization and modernization.

As a result, the selection of technologies for each evolution stage plays a crucial role in building various technological policies with a view to attracting labor, balancing sources, generating reinvestments and contributing to the stabilization of security and politics and sustainable economic growth.

We would like to suggest some concrete technology criteria to select proper technologies for the modernization of the mechanical engineering as follows:

1. Selecting technologies based on the business and production targets, market demand and the state-of-the-art features of the industry.

The local consumer market of mechanical products is both small and not stable and only introduces its potentials. Therefore, it's hard to choose and determine the plan for technological development. This is right in both the macro- and micro levels. When changing into the market economy, the market size will be decisive to the plans for technological and production development.

The local market is also restrained due to low per capita GDP. The market for export requires high competitiveness. It's not easy to enter and find a firm foothold on overseas markets with unstable production, monotonous designs and poor quality of the mechanical products. Thus, to select the outlets for development plans is a key decision that the manufacturer faces when wishing to boost their production.

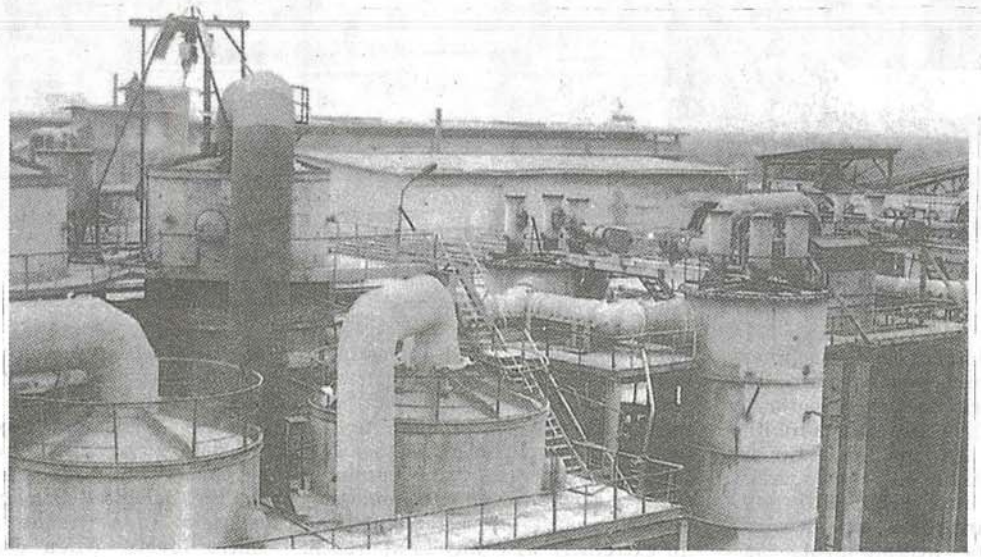
The selection of criteria to innovate technologies must be supported with suitable management mechanisms and policies with a view to encouraging manufacturers and traders to determine advanced technologies in line with the sector's orientation, the national industrialization and modernization towards import substitution and export.

The technologies selected must solve urgent problems, at the same time prepare necessary preconditions for the near future (10-20 years) and farther (25-30 years). The choice must be based on a multi-size and multi-level structure in the mechanical engineering sector. This is connected via labor division.

2. Depending on comparative advantage and economic effec-

tiveness

The experience from many countries which have succeeded in their industrialization and modernization of the mechanical engineering sector revealed the best solution is to implement a mixed policy between import substitution and export-oriented production. This mixed solution allows the effective combination of internal comparative advantage with external ities. To exploit internal ities is to renew technologies to produce goods replacing imports at the early stage of industrialization (this selection is indispensable, many developed countries experienced this stage).



The strategy for import substitution also creates rapid evolution of the local industry on the whole and the mechanical engineering sector in particular in a specific time of the early industrialization, then the sector will reach a comparative advantage in some selected mechanical products.

To make the best use of exogenous comparative advantage means to pursue the policy on export-oriented production. This is in fact a rule of comparative advantage that every country, locality with different conditions of natural resources, labor, technology and capital must respect. This is also a policy to give rise to economic potentials, encourage competition and generate strong incentives for the sector's development. It is also a challenge to the mechanical engineering sector. In the current conditions, most of enterprises in this sector encounter difficulties in capital, technology and management level. This forces us to make bold decisions based on four projects to develop technologies as follows:

- Capital-intensive project
- Technology-intensive project
- Labor-intensive project
- Quickly profitable project.

In brief, to fully exploit the factor of comparative advantage in exports production is the method of economic development with the aim to increase incomes, accumulation and in-depth investments. Regarding the current mechanical engineering sector, the realization of joint-venture projects to assembly products in SKD, IKD and CKD forms has an essential meaning to the sector's modernization.

3. Depending on the popularity, compatibility and capability to master the technology

Technological evolution is a process including many stages in line with the changes in industrial environment of each country and each situation in the direction of industrialization and modernization. We can isolate three stages: taking shape, developing firmly and getting maturity. The reality has indicated over the past decades that the orbit of industrial development in developed countries is in accordance with the above process, but in developing countries the process is in constrast. We can use this concept to make a ground for studying and choosing the technological development plan for the mechanical engineering sector in HCMC.

We are now at the early stage of industrialization, therefore, the selection of technologies cannot be an exception of the development process mentioned above (In each stage, we should consider the flow of technologies and the market mechanism in line with each factor).

4. The role of internal technological capacity

In fact, the process of innovating and selecting technologies is a course of absorbing, adapting, improving and developing imported technologies into those having individual features. The national technological capacity is the ability to develop imported technologies or buy effectively necessary ones and cope with big changes in the trend of shortening their life cycle.

To strengthen the national technological capacity, we need not implement step by step as common practice. We should understand the "know how" ability is extremely important. This can be proved in experience from Japan and South Korea. They have mastered imported technologies because of seizing "know how",. so they are successful in exporting their own technologies.

As a matter of fact, the application of technologies to the traditional industries is just to take advantage of the mechanization achievements that are still strange to our country. This is significant to the industrialization and modernization of the mechanical engineering sector and also an approach to the selection of appropriate technologies.

In short, diversifying and developing multi-level technologies is a suitable choice for the industrialization and modernization of the mechanical engineering sector in HCMC. The most important criterion for technology selection targets at the highest productivity to firmly develop the enterprise and the entire country. Obviously, there should be persons understanding the process of selecting effective technologies. As a result, we have to make uniform policies to train and attract human resources for the industrialization and modernization of the mechanical engineering sector■