

Chapter 9 PROJECTS TO REALIZE THE STRATEGY

9.1 Land Acquisition and Infrastructure

9.1.1 Land Acquisition

After the initiation of land acquisition from April 2002, the progress is quite slow and only 270 ha land has been acquired as of March 2007. However, the remaining land of about 540 ha for Phase-1 is planned to be acquired by June 2008 in accordance with the order by prime minister (Letter No. 1310/TTg-KG dated August 24, 2006). Out of the 540 ha land Ha Tay Province officially stated that about 400 ha of land acquisition will be completed within the year 2007 by his letter No. 96 BC/BQL dated 23 May 2007, and this land includes almost all of the Research and Development Zone in Phase 1 as shown in Figure 9.1-1.

In order to realize the schedule the possible actions to be taken by Ha Tay Province and Thach That Land Acquisition and Compensation Board (LACB) for the issues of land acquisition listed in section 5.5.1 were analyzed and shown as correlation chart in Figure 9.1-2.

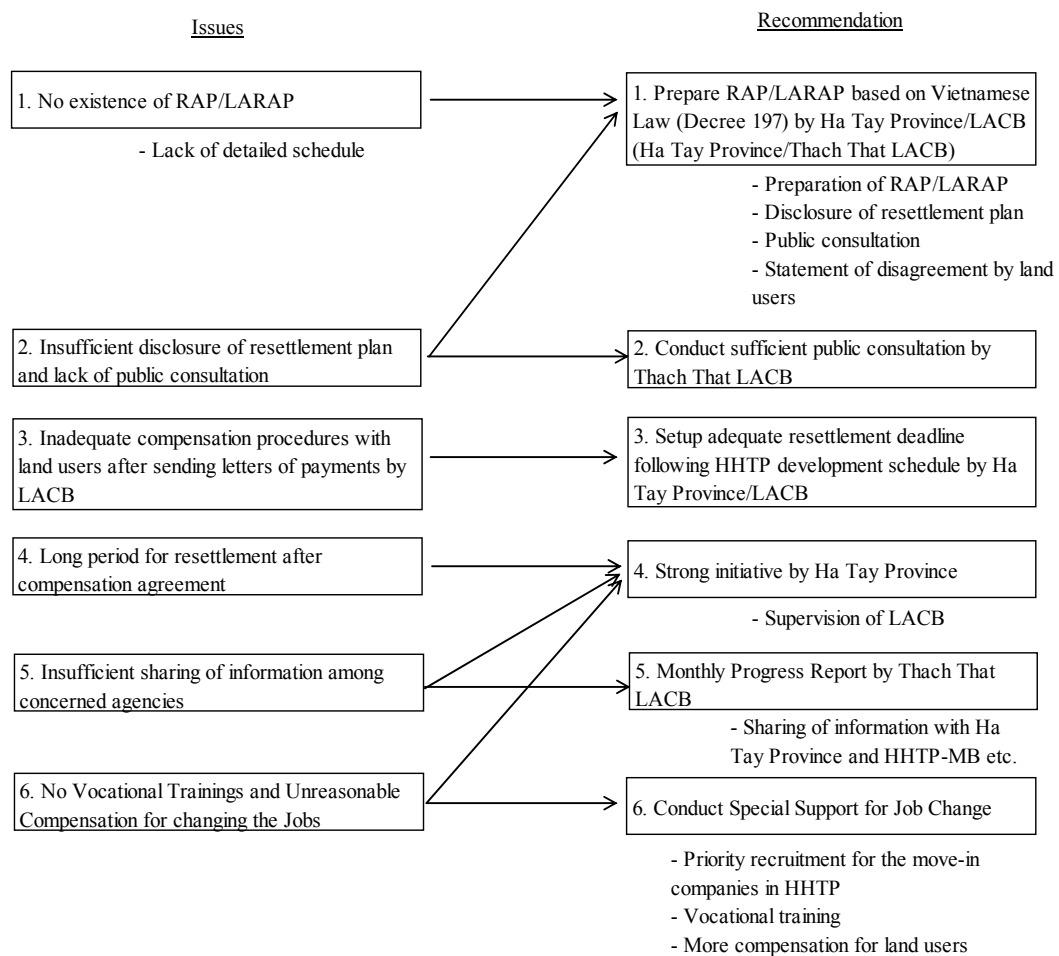


Figure 9.1-1 Recommendations on Land Acquisition from Analysis of Issues

The nominated six recommendations in Figure 9.1-2 are explained as follows.

- (1) Preparation of Resettlement Action Plan (RAP) or Land Acquisition and Resettlement Action Plan (LARAP) based on Vietnamese Law by Ha Tay Province and Thach That LACB

Once the RAP or further LARAP are prepared with the required contents in Decree 197 on land acquisition, compensation and resettlement, the most of lacking information such as detailed schedule including disclosure of tentative resettlement plan to land users and responses to statement of disagreement by land users on the conditions of compensation can be covered. It can enhance the observance of schedule and sufficient information for the understanding of resettlement procedures by land users. As a part of compensation and support, the adequate vocational training or monetary support for land users who have to change the job due to the land acquisition should be clearly mentioned.

- (2) Sufficient Public Consultation by Thach That LACB

In order to establish the better compensation and support frameworks the sufficient number of public consultation should be held by Thach That LACB and the minutes of meetings should be prepared and reported to Ha Tay Province.

- (3) Setup of adequate resettlement deadline following HHTP development schedule

In order to avoid the delay of HHTP development, the adequate resettlement deadline of land users should be set. It can reduce the possibility of some land users to continue staying in their lands even after agreeing the conditions of compensation and resettlement.

- (4) Strong Initiative by Ha Tay Province

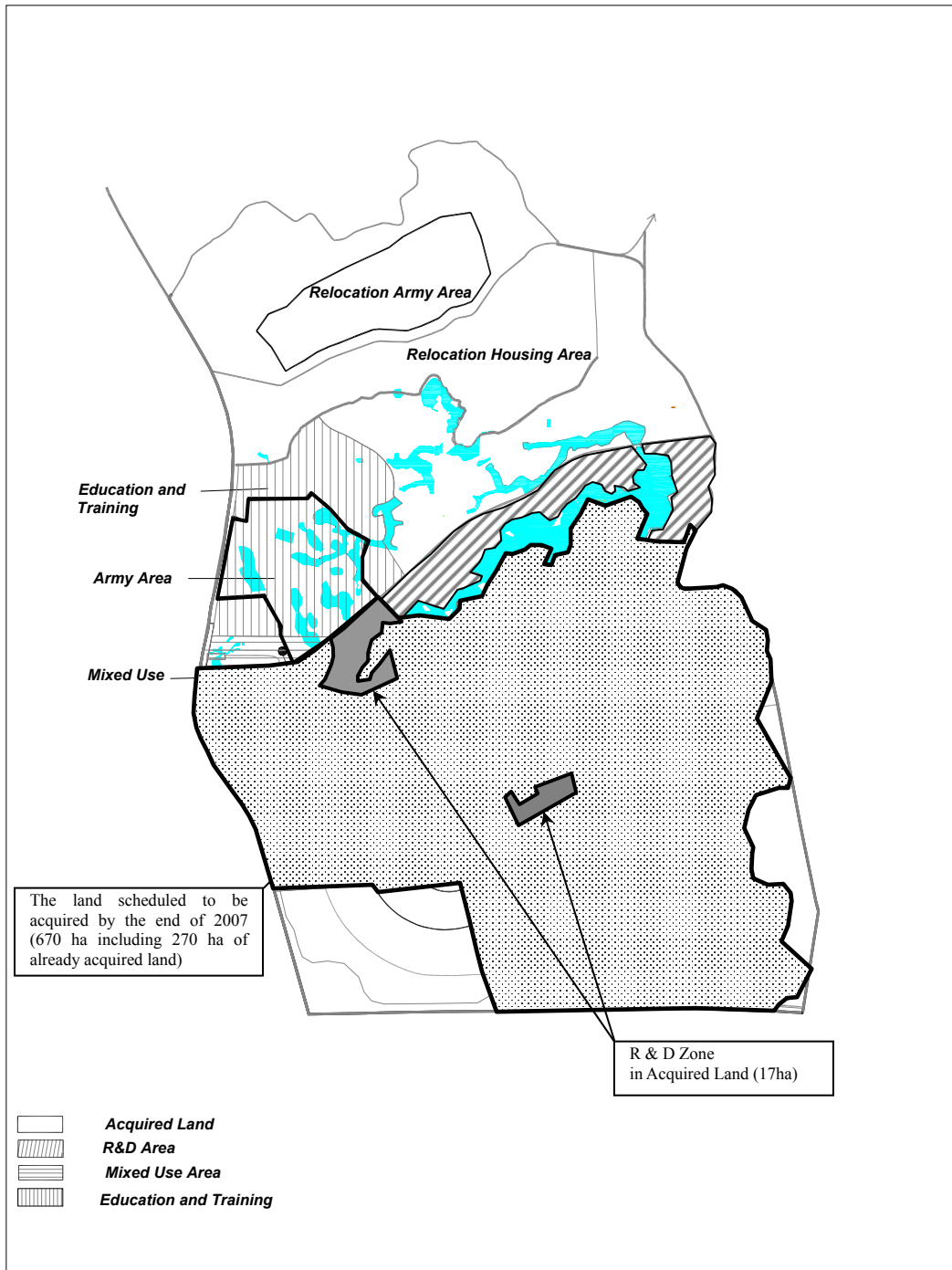
In order to avoid the delay of land acquisition work, Ha Tay Province as a supervisor of the land acquisition of HHTP area should perform the stronger initiative.

- (5) Monthly Progress Report by Thach That LACB

In order to achieve the land acquisition and resettlement works with quicker tempo than the past progress, the frequent preparation of progress report is required for adequate monitoring by Ha Tay People's Committee. The preparation of monthly base is recommendable and it should be sent to Ha Tay People's Committee and all the concerned agencies such as the HHTP-MB as well.

- (6) Special Supports for Job-Changes of Land Users

In order to reduce the reluctance of land users to sell the lands, quit the jobs such as agriculture and change to new jobs, the special supports by mainly Ha Tay Province such as 1) priority recruitments for move-in companies to HHTP, 2) vocational training to the major industries and 3) more compensation amount for land users in case they do not want to work in HHTP or shift to other kind of jobs than the ones of which skills can be provided by vocational training.



Source: JICA Study Team

Figure 9.1-2 Land Acquisition Site Map

9.1.2 Infrastructure Development

(1) Current Strategy of the Land Development Plan

The current strategy to develop HHTP was set out by several decisions issued by the Prime Minister, under which functional zones other than the R&D zone will be developed by a development company and the common infrastructure to link those zones and connect to the external infrastructure will be developed by the HHTP-MB.

Based on the demarcations above, the HHTP-MB is responsible for development/construction work of: (i) common infrastructure and (ii) R&D zone. In addition to those works, it is necessary to consider that the HHTP-MB be responsible for land preparation in parts of the functional zones in order to accelerate the development and avoid conflicts in the construction work.

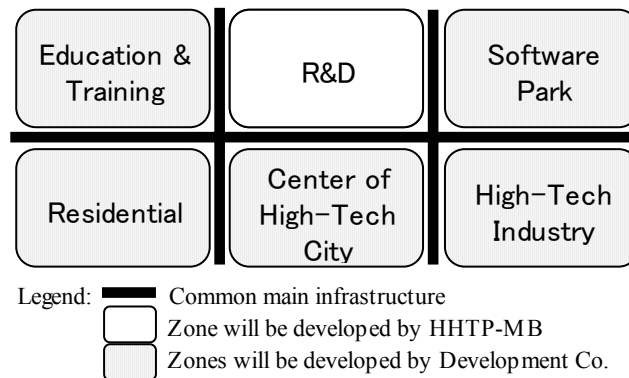


Figure 9.1-2 HHTP Development Scheme

(2) Basic Common Infrastructure

The basic common infrastructure for HHTP development may consist of the items below:

- 1) Road and transportation system, including an interchange, roads, bridges and drainage.
- 2) Water supply system, including distribution pipelines, a reservoir and elevated tanks.
- 3) Sewerage system, including collection pipes, booster pumps and a treatment plant.
- 4) Power supply system, including sub-stations, power lines and ring main units.
- 5) Conduit for telecommunication lines.
- 6) Minimum land preparation in R&D zone and some other parts to attract investors effectively.

(3) Advanced Infrastructure

In addition to the common infrastructure, the following infrastructure is required for number of high-tech enterprises and research institutes.

- 1) Power supply without blackout: To achieve this condition as far as possible, at least direct power transmission by 220kV national gridline from two different sources will be required; in addition direct supply from a power station would be the best solution technically.
- 2) High speed telecommunication/internet system: To achieve this condition, national level critical issue is necessary to be solved by installing an additional international broadband communication line, followed by installing a high capacity telecommunication system and an advanced telecommunication system into HHTP.

(4) Transportation Access to and from International Gateways

The two road projects are required to be completed to have better transportation access to and from international gateways.

The Lang-Hoa Lac Highway connecting Hanoi and Hoa Lac (HHTP) will be expanded from the current 12 meters to 140 meters width with a three-lane expressway road and a two-lane frontage road in each direction. This project is now under construction and will be completed by the end of 2009.

Ring Road No.3 (RR-3) linking the Lang-Hoa Lac Highway and National Highway No.5 (NH-5) will finally connect to the main ports in Northern Vietnam such as Hai Phong and Cai Lan. A large proposition of RR-3 is under construction, however, some parts still remain missing from the current construction contract. It is necessary to connect RR-3 to NH-5 to provide better access from HHTP to the main ports.

9.1.3 Projects to realize the Strategy

Based on the above considerations on the strategy for land acquisition and infrastructure, the following projects are required for realization.

- 1) Land Acquisition and Resettlement
- 2) Development of Common Infrastructure and the R&D Zone
- 3) Development of Functional Zones other than the R&D Zone
- 4) Development of Power Supply without Blackout
- 5) Development of High-Speed Telecommunication/Internet System
- 6) Development of Missing Part of RR-3

9.2 Government Initiatives

9.2.1 Strengthening of the HHTP-MB to Attract State Research Institutes by placing it Directly Under the PM

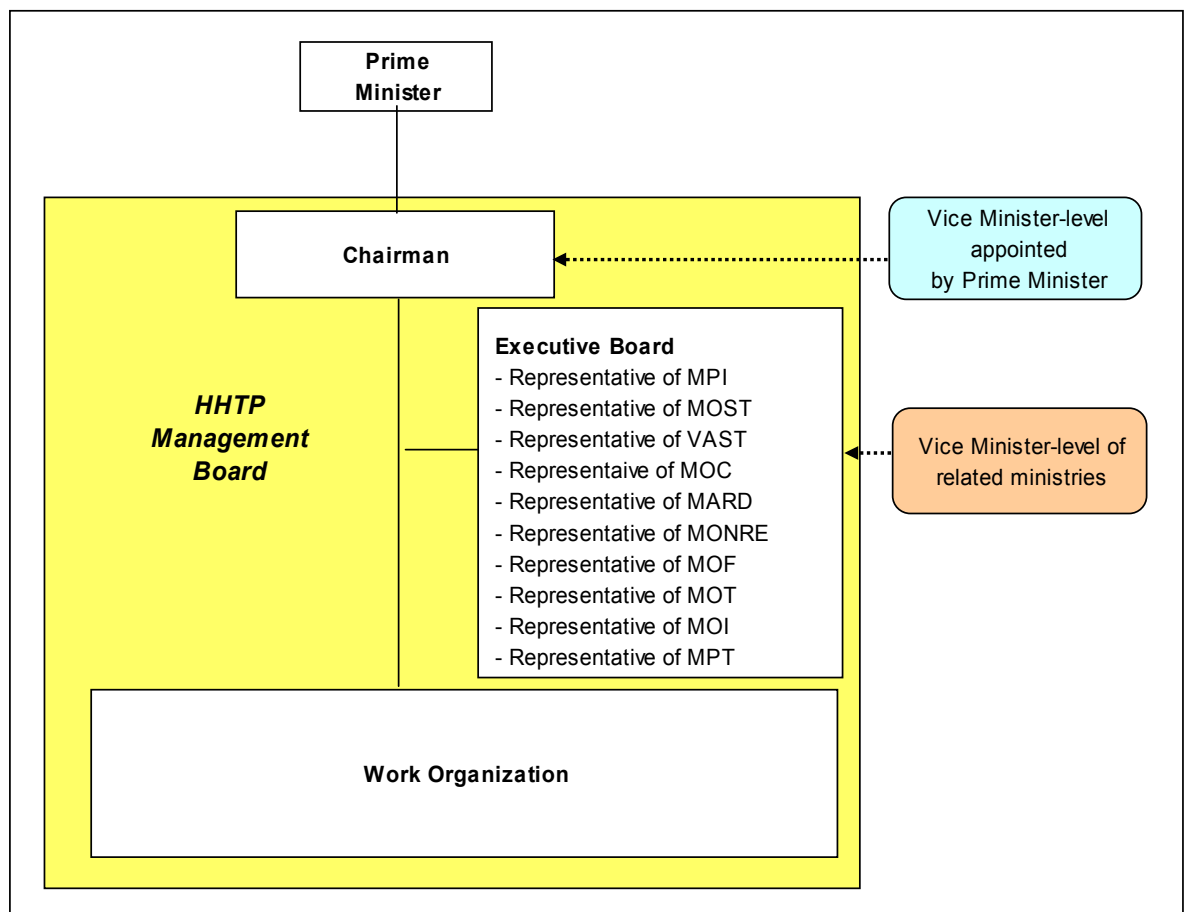
One of the most important tasks of the HHTP-MB is to build a focal point for State research institutions in HHTP.

State research institutions are generally affiliated with the central ministries and the ministry-level agencies. MOST is one of these ministries and has not yet succeeded in relocating or new establishing any research institutes under its authority. Therefore, it seems difficult for MOST to promote relocation or new establishment of the research institutes under other ministries.

It is proposed that the HHTTP-MB be placed directly under the Prime Minister so as to have stronger authority to operate the cross-ministry organization. Moreover, it is required to establish an executive board inside the HHTTP-MB. The executive board should be composed of vice minister-level representatives of the relevant central ministries and ministry-level agencies that are in positions to influence the new construction and relocation of research institutions, as illustrated in Figure 9.2-1.

9.2.2 Actions to Attract State Research Institutes at the Initiative of Government

The Executive Board of the HHTTP-MB and the ministry or ministry-level agencies will cooperatively take actions to attract State research institutes in the following sequence as illustrated by Figure 9.2-1.

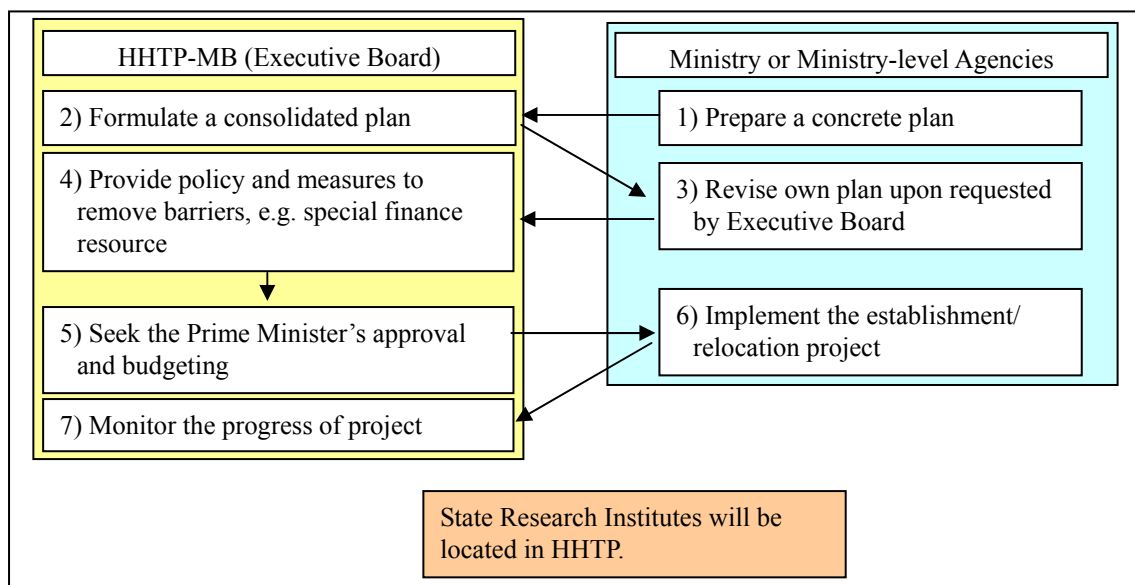


Source: JICA Study Team

Figure 9.2-1 Recommendation on Executive Board in the HHTTP-MB

- 1) Each ministry or ministry-level agency will prepare a concrete plan of establishment/relocation for a specific institute based on their strategy for R&D. They will submit the prepared establishment/relocation plans to the Executive Board of HHTTP.

- 2) The Executive Board will formulate a consolidated plan for establishment/relocation of State research institutes after carefully examining the specific establishment/relocation plans to be formulated by each ministry or ministry-level agency. The Executive Board will provide clear criteria for selecting the appropriate research institutes in HHTP.
- 3) Each ministry or ministry-level agency will revise its own plans as requested by the Executive Board.
- 4) The Executive Board will provide a policy and measures to remove barriers to the establishment/relocation of State research institutes. Potential issues are the financial burden of establishment/relocation, and operation/maintenance, incentives for research institutes, transporting measures for commuters, etc. Special financial resources may be needed for State research institutes which will be located in HHTP.
- 5) The Executive Board will seek the Prime Minister's approval and budgeting so that each ministry or ministry-level agency can execute its plan.
- 6) Each ministry or ministry-level agency will execute the project of establishing or relocating State research institutes under their own authority to HHTP.
- 7) The Executive Board will monitor the progress of the consolidated plans to be executed by the ministries or ministry-level agencies.



Source: JICA Study Team

Figure 9.2-2 Actions to Attract State Research Institutes to HHTP

9.2.3 Projects to Realize the Strategy

Based on the above considerations on the strategy for government initiatives, the following projects are required for realization.

- 1) Strengthening the HHTP-MB by placing it directly under the Prime Minister

2) Attraction of State research institutes at the initiative of government

9.3 Project Organization

9.3.1 Completion of Organizational Structure

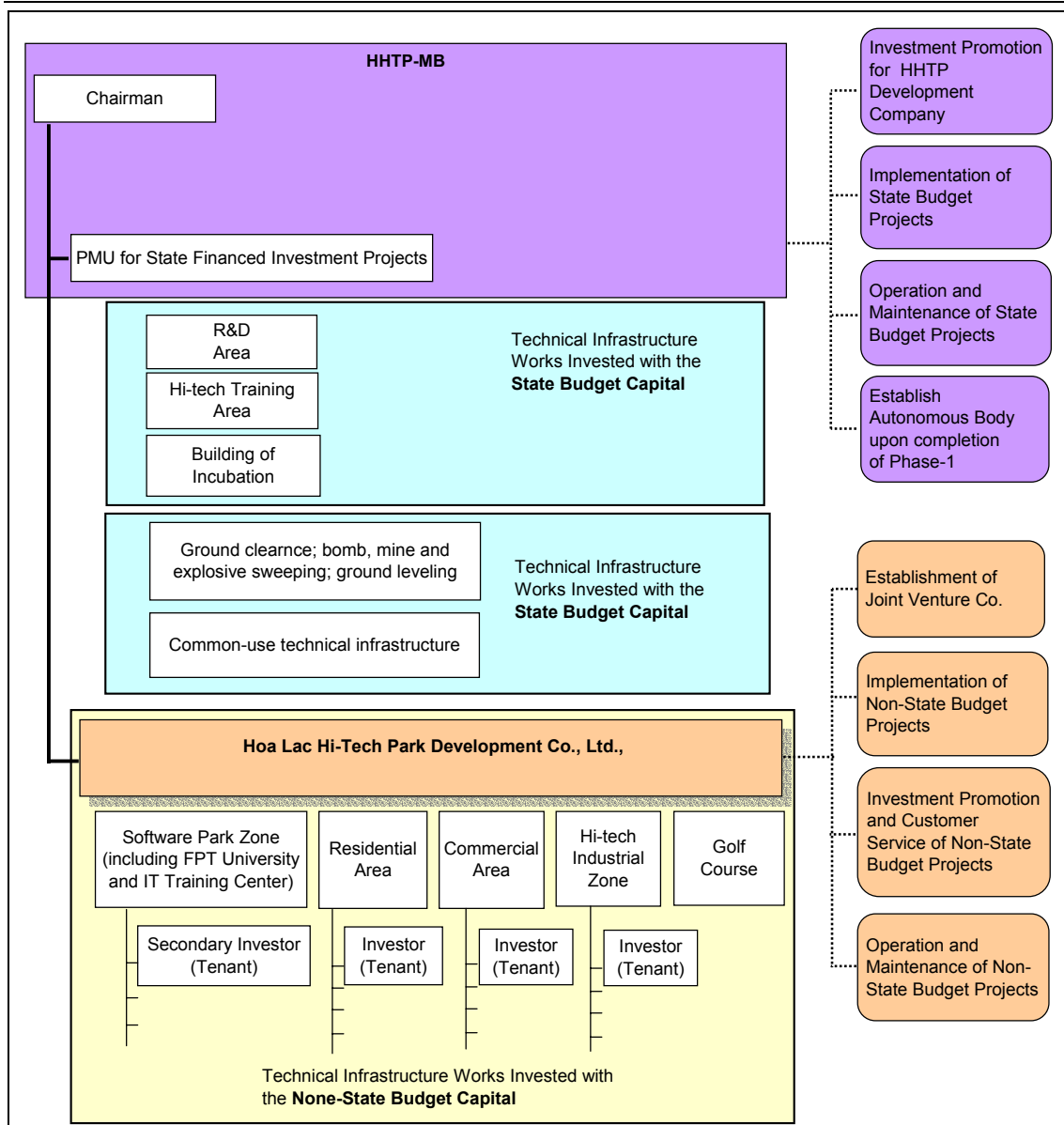
As stated previously, the organizational structure of the HHTP project is in a transitional state. The HHTP-MB is, therefore, urged to establish a project implementation organization.

The key player in the constructing of State funded technical infrastructure is the PMU in the HHTP-MB.

Other key players are the HHTP development company, which is responsible for technical infrastructure financed with non-State funding. However, to date, only two such companies have been selected. The first one is FPT Hoa Lac High-Tech Park Development Company Ltd. (FHHTPDC) which will organize the construction of technical infrastructure in the Software Zone including the Software Park, FPT University and IT Training Center. The second is VINACONEX for Stage-1 development.

It is vital to use capital and human resources from the private-sector for the project. Without positive involvement of the private sector, the project has little chance of success.

Figure 9.3-1 illustrates a possible organizational structure for the project. The entire technical infrastructure financed by non-State investment is developed by one Development Company.



Source: JICA Study Team

Figure 9.3-1 Recommendable Organizational Structure

The structure has the following advantages.

- 1) The HHTP-MB workload for coordination can be minimized, because there is only one Development Company.
- 2) Consistent development can be executed by minimizing the number of required interfaces.
- 3) Because it is a simple structure, customers are likely to have the impression of stability.

The proposed organizational structure is recommended for these reasons.

9.3.2 Strengthening of HHTTP-MB

(1) Sharing of Responsibility

It is important to demarcate responsibility with the HHTTP-MB and HHTTP Development Company so that both parties can cooperate to implement the project in partnership. Demarcation of responsibility is proposed in Table 9.3-1.

Table 9.3-1 Demarcation of Responsibility

	HHTTP-MB	Development Company
Investment in Infrastructure	State financed investment is provided to build infrastructure for: <ul style="list-style-type: none"> • Common infrastructure • Functional areas in which public sectors will invest, like R&D Zone 	Invest to build infrastructure in functional zones, including infrastructure in the Software Park, Hi-tech Industrial Area, etc.
Construction of Infrastructure	Take charge of State financed investment projects.	Take charge of Non-State financed investment projects.
Attracting Investors	Attract State agencies (mainly State research institutions) to the areas with the State financed investment.	Attract both foreign and Vietnamese private investors.
Investment Approval Support Service	Where necessary, provide all investors with investment approval support service.	None.
Complaint Settlement Service	As one stop station, promptly settle the complaints made by investors.	Where necessary, help HHTTP-MB with tasks for complaint settlement.
Customer Service	Provide various services to State agencies, mainly State Research Institutions.	Provide various services to both foreign and Vietnamese private investors.
Operation and Maintenance of Infrastructure	<ul style="list-style-type: none"> • Common infrastructure • Functional areas in which public sectors will invest, like the R&D Zone 	<ul style="list-style-type: none"> • Functional areas except those invested in by the public sectors.

Source: JICA Study Team

(2) Strengthening Capability for Infrastructure Construction

On 12th August 2006, the Prime Minister issued a directive to MOST to promptly strengthen personnel of the HHTTP-MB so that the HHTTP-MB could have adequate capacity for management, infrastructure construction and investment promotion to fulfill the requirements of HHTTP construction and development (refer to Prime Minister's letter No. 1310/TTg-Kg dated August 24, 2006).

It is recommended that the HHTTP-MB collaborate with the specialized agencies (EVN, MOC, and a telecommunication company either VNPT, Viettel, or FPT) and experienced developers for dispatching highly experienced experts to the HHTTP-MB. The HHTTP-MB can promptly strengthen their capability in infrastructure construction in a convincing way by collaborating with the special agencies. It is suggested that the

HHTTP-MB attract a highly skilled workforce by providing better than standard employment conditions, as is the case with Saigon Hi-tech Park.

(3) Strengthening Capability for One Stop Services

It is a matter of course that the HHTTP Development Company will take responsibility for investment promotion and customer services for the private sector, as the company invests in infrastructure for attracting the private sector. Consequently, the HHTTP-MB will not have to take responsibility for investment promotion and customer services, nor have departments for such tasks.

One stop services that the HHTTP-MB is required to provide all investors in HHTTP are:

- 1) Investment approval support service
- 2) Claim settlement service

The HHTTP-MB is required to perform these tasks, paying attention to customer oriented services. Taking the importance of the customer oriented services into consideration, the following are recommended: The HHTTP-MB's personnel in charge of one stop services are required to work in HHTTP.

- 1) The HHTTP-MB is required to increase the number of members who can communicate with foreign investors in English or Japanese.
- 2) The HHTTP-MB is required to establish a system to settle complaints received by the one stop service department.
- 3) The relationship with the existing three customers (pioneer tenants) is important enough to affect the reputation of HHTTP. Because of the importance of this relationship, the HHTTP-MB is required to begin by providing one stop services for the pioneer tenants. Besides improving its reputation, providing the pioneer tenants with one stop services will enhance the experience of the HHTTP-MB.

9.3.3 Projects to Realize the Strategy

Based on the above considerations on the strategy for project organization, realization of the strategy requires the following projects:

- 1) Completion of the organizational structure
- 2) Capacity-building of the HHTTP-MB

9.4 Provision of Human Resource

9.4.1 Desired Human Resource

The HHTTP is expected to attract excellent human resources from all over the country. Such human resources will encourage technological innovation in cooperation with industry, education, and R&D. The human resources needed for innovation is not just cheap labor, but talent with knowledge, technology, and skills.

9.4.2 Measures to Provide Human Resources

The HHTP is required to satisfy the following three conditions in order to collect excellent human resources from all over the country:

- To provide a place for working and learning
- To provide a high-grade environment for dwelling and living
- To provide a good atmosphere as a science city, in which innovative persons want to work and live

These conditions will be satisfied by realizing the strategy of the five functions of HHTP. A good place for working and learning will be provided by attracting high-tech enterprises, research institutes, and educational institutes. A high-grade environment for dwelling and living will be provided by the urban function. A good atmosphere as a science city, in which innovative persons want to work and live, will be created by the Hoa Lac brand which will be created through various activities performed in HHTP for the popularization of science and technology.

Upon the satisfying of all these conditions, it is important for HHTP to provide employment service to investors, for example:

- Building a cooperative relationship with FPT University, VNU, and other educational institutes to be located in HHTP
- Posting job information from investors on the internet
- Holding joint job fairs

9.4.3 Projects to realize the Strategy

Based on the above considerations on the strategy for provision of human resource, the following projects are required for realization.

- 1) Provision of an employment service

9.5 Provision of Urban Function

9.5.1 Housing and High-Quality Living Environment

Because HHTP is to be a self-sustainable city, housing and a high-quality living environment are required to be provided to attract State research institutes and high-tech enterprises. It is required to provide demand-responsive housing and high-quality living environment in HHTP including:

- Affordable housing for low and middle income groups
- Housing for high income groups
- Living environment enriched with natural conditions and amenities

9.5.2 Urban Amenity Core

In addition to housing, it is required to develop urban amenity core, which include:

- Parks and green spaces
- High-grade comprehensive urban functions including commercial, business, medical, and amusement

9.5.3 Autonomous Urban Function

Various functions of autonomy are required in HHTP just like those normally provided by local government offices. It is expected that HHTP will need the autonomous functions in the table below.

Table 9.5-1 Autonomous Urban Function

HHTP Activities	Autonomous Function
Industrial/Production	on site customs office
Public Services	local government administration, police, post office, fire fighting, basic education, health, medical and public services
Common Development	construction approvals, infrastructure management and environmental protection

Source: JICA Study Team

HHTP has been developed under the jurisdiction of MOST without adequate autonomy. It is expected that Ha Tay province has autonomy over HHTP for the public services above. With regard to on site customs office in the table, it is necessary to clarify demarcation between the HHTP-MB and Ha Tay province, taking into account the importance of attracting high-tech enterprises.

It is required that the HHTP-MB and Ha Tay province jointly prepare the action plan for the establishment of the autonomous functions above as soon as possible.

9.5.4 Projects to realize the Strategy

Based on the above considerations on the strategy for urban function, the following projects are required for realization.

- 1) Provision of demand responsive housing and high-quality living environment
- 2) Development of urban amenity core
- 3) Establishment of autonomous urban function

9.6 Attraction of R&D Function

9.6.1 Considerations of Attracting R&D Function

It is necessary to examine the following two issues to take the strategy for R&D function into consideration:

- 1) What kind of technology development is desired in HHTP?

2) What measures are required for attraction of R&D function in HHTP?

9.6.2 Key Technological Directions for the Socio-Economic Development

Decrees and decisions have not clearly defined what kind of technology development should be made in HHTP; however, it is supposed such technology development is the key technological directions for the socio-economic development defined by “*Vietnam S&T Development Strategy by 2010*” enclosed with Decision No. 272/2003/QĐ-TTg dated December 31, 2003 by the Prime Minister.

According to the above strategy, the country needs to focus on the development of key technologies shown below.

- 1) Information-Communication Technologies (ICT), including new technologies for the communications and software industries
- 2) Bio-technologies, including gene technology, industrial-oriented micro-biology technology, enzyme-protein technology for the development of food and pharmacy industries, cell technology (flora and fauna) for selecting and producing new breeds in agriculture, forestry, aquaculture and developing cell therapy in healthcare, bio-technology in agriculture (agriculture-forestry-fishery), bio-technology in processing, bio-technology in pharmacy, and bio- technology in environment
- 3) Advanced material technologies including metal materials, polymer and composite materials, electronics and photon materials, medicine–biology materials, and nano material technologies
- 4) Automation and electronic-mechanic technologies including designing and manufacturing technologies with the support of computers (CAD/CAM), comprehensively integrated automation technologies, computerized number-controlling technologies (CNC), automation technologies, and robot techniques (especially intelligent robots and parallel robots)
- 5) Atomic energy and types of new energy including nuclear electricity, atomic techniques, radiation and radio-active isotopes, studies on new types of energy (solar energy, wind energy, biological energy, etc.)
- 6) Space technologies including acquiring, mastering technologies and launching small satellites to observe the Earth and land-receiving stations, technologies for remote sensing and global positioning for scientific research and basic surveys on natural conditions and resources; monitoring the environment; land use and territorial planning; forecasting and monitoring natural disasters; raising and catching marine products; positioning means of transportation; and serving the national defense and security, etc.
- 7) Mechanical–machinery technologies: advanced technologies are studied and used in the mechanical–machinery industry, which should be developed strong enough

to provide some equipment and machines, meeting domestic demands and for exports; mould-making technology; machining technology: together with upgrading and modernizing existing equipment and machines; and surface processing technology

9.6.3 Other Recommended Key Technological Directions

In addition to the above key technological development directions, some important directions are discussed here.

In order to facilitate the development of Vietnamese economic activities in international markets, it is required to perform various metrological tasks including formulation of consistent policies concerning measurement standards and legal metrology, conducting R&D activities of measurement standards, providing metrological services such as testing and inspections of measuring instruments, and metrological training.

S&T development contributes to the socio-economic development. However, it will cause social problems such as environmental and food safety problems as well. It is necessary to conduct R&D activities to resolve such social problem.

Based on the above discussion, it is recommended to investigate establishment of the following R&D institutes in HHTP:

- 1) R&D institute to cope with metrological tasks
- 2) R&D institute to cope with environmental issues
- 3) R&D institute to cope with securing food safety

9.6.4 Measures for Attracting State Research Institutes into HHTP

In addition to adequate infrastructure and research environment enriched with natural conditions, the following measures are necessary for attracting State research institutes to HHTP:

(1) Strong initiative of the Government

Refer to the detailed measures in the section 9.2.

(2) Scientific and technological development investment

It is required to look for adequate capital sources for investment in the establishment/relocation of State research institutes in HHTP from the following candidates.

- State budget: According to Article 37, Clause 3a of Law on Science and Technology (No. 21/2000/QH 10 of June 9, 2000), the State budget invested in S&T shall be used for performing priority and key scientific and technological tasks as well as scientific and technological tasks in the service of common interests of society.
- The national scientific and technological development fund (refer to Article 39

of Law on Science and Technology)

- Scientific and technological funds of the ministries (refer to Article 40 of Law on Science and Technology)
- Capital sources from international cooperation for S&T development by various forms such as bilateral and multi-lateral cooperation on R&D and human resource development

(3) Mechanism for motivating workers in S&T

Depending on the country, those employed in S&T do not earn particularly-high payment commensurate with the hard and long education required to get a job. Although motivation of those working in S&T cannot be considered purely from a payment perspective, it is preferable to ensure conditions for S&T staff commensurate with the sophisticated knowledge, technology, or skills, they possess in order to recruit excellent human resources and call forth their potential.

It is required to establish mechanisms for motivating S&T staff, for example:

- Provision of treatment commensurate with advanced knowledge, technology, and skill including an award and reward money to S&T staff producing good results
- Provision of overseas training for learning advanced S&T
- Encouragement of establishing venture companies originating from State research institutes

9.6.5 Projects to realize the Strategy

Based on the above considerations on the strategy for R&D function, the following projects are required for realization.

- 1) Formulation of establishment/relocation plans for individual State research institutes
- 2) Development of financing plans for establishment/relocation of individual State research institutes
- 3) Provision of mechanisms for motivating S&T staff

9.7 Attraction of High-Tech Industrial Function

9.7.1 Considerations of Attracting High-tech Industrial Function

It is necessary to examine the following two issues to take the strategy for high-tech industrial function into consideration:

- 1) What types of high-tech industries are desired in HHTP?
- 2) What measures are required for attraction of high-tech industrial function in HHTP?

9.7.2 High-Tech Industrial Areas and Investors Encouraged in HHTP

According to Decree No.99/2003/ND-CP issued by the Prime Minister, dated August 28, 2003, the following areas are to be encouraged to invest in HHTP:

- 1) Information, communication and informatics software technologies
- 2) Biotechnologies in service of agriculture, aquaculture and health care
- 3) Microelectronics, precision machinery, mechatronics, opto-electronics and automation technologies
- 4) New material technologies and nano technology
- 5) Environment-friendly and new energy technologies
- 6) A number of other special technologies

Investors encouraged to high-tech industry in HHTP are foreign enterprises, Vietnamese and overseas Vietnamese enterprises as illustrate in the figure below.

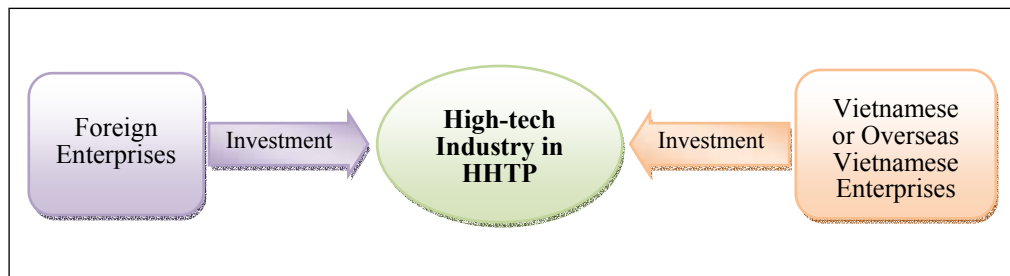


Figure 9.7-1 Investors in High-tech Industry in HHTP

9.7.3 Investment Promotion Measures for High-Tech Enterprises

HHTP is required to provide a comprehensive incentive package for attracting high-tech enterprises, composed of preferential taxation, customer-friendly one-stop service, technical service, human resource development service, advanced infrastructure, etc.

All the measures for attracting high-tech enterprises are collectively shown below to give a clear image toward investment promotion of high-tech enterprises, although some of them are overlapped with measures taken for realizing other strategies.

(1) Tax incentives

Present tax incentives for high-tech enterprises are good enough, but cannot differentiate HHTP from other industrial areas because the tax incentives are the same as for high-tech enterprises in any industrial area in Vietnam. Accordingly, it is required to provide additional incentives specifically for the high-tech enterprises in HHTP. From this point of view, the following are proposed.

1) Reduction of personal income tax for workers in HHTP

The maximum personal income tax rate is 40% in Vietnam, being higher than the level in surrounding countries in the region: Malaysia (28%), Singapore (21%), and Thailand (37%). There are no deductible items in personal income tax. The high-tech enterprises need many highly-educated employees with high income. It is

desirable to reduce personal income tax for employees of high-tech enterprises in HHTP from the viewpoint of attracting high-tech enterprises.

2) Double deduction for R&D and human resource development expenditure

The high-tech enterprises continually need to invest in R&D and human resource development (HRD) activities. In order to encourage such activities in HHTP, it is desirable to allow the high-tech enterprises in HHTP to take a double deduction for R&D and HRD expenditures.

(2) Procedure

The procedures for investment license approval, custom clearance, and so forth are not so complicated for Vietnamese companies. However, for almost every foreign company, the procedure is always very difficult. Therefore, support services for these procedures are needed. HHTP has provided such support services, but not earned a good reputation of the existing and potential investors yet.

It is required to improve the one-stop and customs clearance services as follows so that HHTP can have a better reputation in regards to these issues.

1) One-stop Service

Although the HHTP-MB has provided a one-stop service to the investors, the investors are not satisfied with it. The following measures are required to be taken to provide a satisfactory one-stop service.

- To strengthen the HHTP-MB
- To provide sufficient support service by HHTP-MB

It is important to strengthen the HHTP-MB to provide a suitable one-stop service as stated in the previous part of the report.

The HHTP-MB has the authority to approve investment licenses. This, however, is not always sufficient for foreign investors. A foreign investor still needs a one-stop service.

A foreign investor often employs a special service agent to obtain the investment license in Vietnam. The HHTP-MB is required to provide a one-stop service helpful enough for the foreign investors without employing such agents.

2) Customs Clearance

The following improvements to customs clearance services are strongly desired by the existing investors in HHTP.

- To set up a custom branch office in HHTP
- To simplify and accelerate the customs clearance process

Existing investors invested in HHTP because a customs branch office was originally planned to be provided. However, it has not been provided yet. It is required to provide the customs branch office in HHTP as soon as possible.

A number of Japanese enterprises in Vietnam are dissatisfied with customs

clearance in Vietnam (according to the Japan-Vietnam Joint Initiative (Phase 2) and the results of a questionnaire survey). It is desirable to achieve simple and rapid customs clearance in HHTP as a pilot model in Vietnam.

(3) Technical Service

HHTP is expected to provide various technical services throughout the country. According to the questionnaire and interview surveys, investors desire the following types of technical services.

1) Testing and Analysis Service in the Environmental, Mechanical and Electronics Fields

The high-tech enterprises require testing and analysis for manufacturing, R&D, and environmental monitoring. Some kinds of testing and analysis require expensive equipment and instruments, but are only occasionally needed. It is therefore highly desirable that HHTP provides services for testing and analysis in the environmental, mechanical and electronics fields to save costs.

2) Technical Support Service for Machining, Circuit Design and Software Development

The high-tech enterprises normally need various technical supports from a number of related enterprises. However, such kinds of supporting industries have not grown up yet in Vietnam because the country is at an early stage of industrialization. Under such circumstances, it is desirable that HHTP attract supporting agents or enterprises to provide technical services for machining, circuit design and software development in compliance with requests by high-tech enterprises not only in HHTP but across the entire country.

(4) Human Resource Development Service

In Vietnam, the foreign industrial enterprises are struggling to recruit engineers and staff; therefore, they are obliged to invest to training. According to the questionnaire and interview surveys, human resource development is one of the most desired services.

1) Foreign Language Especially Japanese Technical Language

In Vietnam, foreign high-tech enterprises, especially Japanese enterprises, have language difficulties in transferring technology to their local employees. Although there are many Japanese language schools in the country, they are not suitable for producing Vietnamese engineers and technicians who can understand technical Japanese at the level required by Japanese enterprises. It is required to teach foreign language in HHTP, especially Japanese technical language, because the Japanese high-tech enterprises are conceivable as the first target of investors.

2) Human Resource Development Services in the Mechanical, Electronics, System Design and Environmental Fields

Foreign high-tech enterprises in Vietnam normally require practical technical training of employees as well as Japanese language training. They require those training particularly in the mechanical, electronics, system design and environmental fields. In order to attract high-tech enterprises to HHTP, it is required to provide human resource development service in such technical fields.

(5) Infrastructure

1) Advanced Infrastructure

Most foreign high-tech enterprises, as a matter of course, require the following advanced infrastructure in high-tech parks if they are to invest there.

- Stable power supply without blackout
- High-speed telecommunication including international communication

2) Reduction of Transit Time to and from the Port

Access to and from the Haiphong Port will be significantly improved by the development of Ring Road-3.

(6) Others

In addition to the measures described above, it is required to use the following mechanisms to take advantage of HHTP's location.

1) Mechanism of Employing Highly-educated Workforce

After VNUH and FPT University start education in and around HHTP, there is a possibility that high-tech enterprises located in HHTP can employ a lot of graduates. It is necessary to create a mechanism of employing graduates by the high-tech enterprises in HHTP.

2) Collaboration with State Research Institutes and Universities

After State research institutes and universities start operation, there is a possibility that high-tech enterprises in HHTP can collaborate with them in training employees, undertaking joint research and contract research work, etc.

3) Rental Factory

In highly-industrialized countries, there are a lot of small and medium-sized enterprises (SME) which have superior technology, expertise, or skill. HHTP needs to attract such SMEs as well as large-sized high-tech enterprises in order to develop the high-tech industry in HHTP.

Compared with large enterprises, SMEs normally require only small space for their operation. They sometimes desire to rent a small factory at the initial step of operation so that they can start without a large investment. It is very important to provide rental factories for such superior SMEs.

9.7.4 Prospect of Investment Promotion Activities

(1) Investment Promotion for the Software Industry

Location conditions of the software zone are summarized as follows:

1) The software zone has three major advantages:

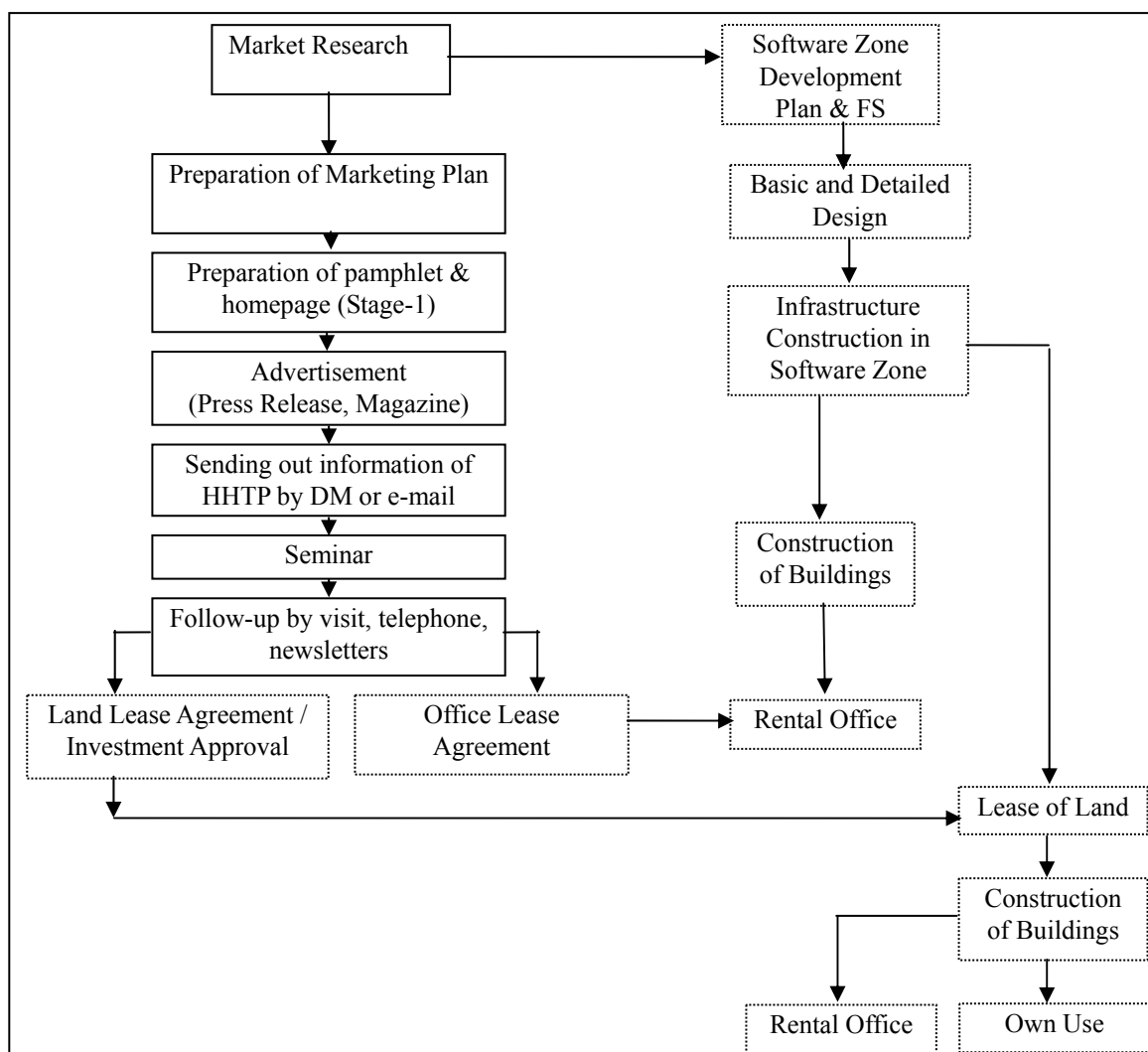
- FPT, which is the largest and most prominent software company in Vietnam, works as the HHTP Development Company. This will have a great appeal for potential investors. FPT is expected to be an anchor tenant.

- HHTP tenants will be able to employ IT-engineers graduated from FPT University, which is scheduled to come to HHTP at the end of 2008.
 - A area of 40 ha was prepared in Stage-1 for the software zone. This is an advantage to execute the construction project early.
- 2) The software zone is expected to be an attractive place for investors if it can satisfy the following requirements of customers.
 - To have adequate infrastructure such as high-speed communication, stable supply of electricity, transportation means from Hanoi, and residence suitable for knowledge workers.
 - To simplify various procedures for investors.
 - 3) In the vicinity of Hanoi, there is no software park like Quang Trung Software City in HCM City, although the software industry is growing rapidly all over the country. In addition to this, the software industry needs less investment than the manufacturing industry. Under such circumstances, HHTP is expected to provide the software industry with good investment opportunity.
 - 4) There are some fields like embedded software, where linkages are foreseen between software and manufacturing companies. This may be an advantage over general industrial parks in Northern Vietnam.
 - 5) As the Vietnamese software industry is expected to face competition with China and India, it is required to make continuous efforts for evolution of the industry.

In consideration of the above condition, the software zone has the best investment climate among the functional zones in HHTP. The zone is, therefore, suitable as a pacesetter of HHTP development. It is important to start sales promotion for the software zone in advance of other zones.

The HHTP Development Company needs to take the initiative in sales promotion of the software zone under supervision of the HHTP-MB.

Although a well-thought-out plan for sales promotion is required in due course, the figure below presents a preliminary sequence of sales promotion as guidance.



Source: JICA Study Team

Figure 9.7-2 Preliminary Sequence of Sales Promotion for the Software Zone

(2) Investment Promotion for the High-Tech Manufacturing Industry

Location conditions of the high-tech industrial zone are summarized as follows:

- 1) Existence of many competitors: The High-Tech Industrial Zone has many competitors, being different from the software zone.
- 2) Anchor tenants: An anchor tenant is a tenant that attracts other tenants. HHTP has no such anchor tenant at this moment. It is important to investigate how to select and attract potential anchor tenants.
- 3) Supporting industries: It necessary for HHTP to invite supporting industry such as highly-skilled manufacturers of parts and materials so as to attract the high-tech industry.
- 4) Human resource: Human resource is an important factor for the high-tech industry as well as the software industry.
- 5) Investment incentive: Special incentives for the high-tech industry are applied to investors in HHTP without complicated procedure. However, they should also be applied to high-tech investors in general industrial parks after they are reviewed and approved.

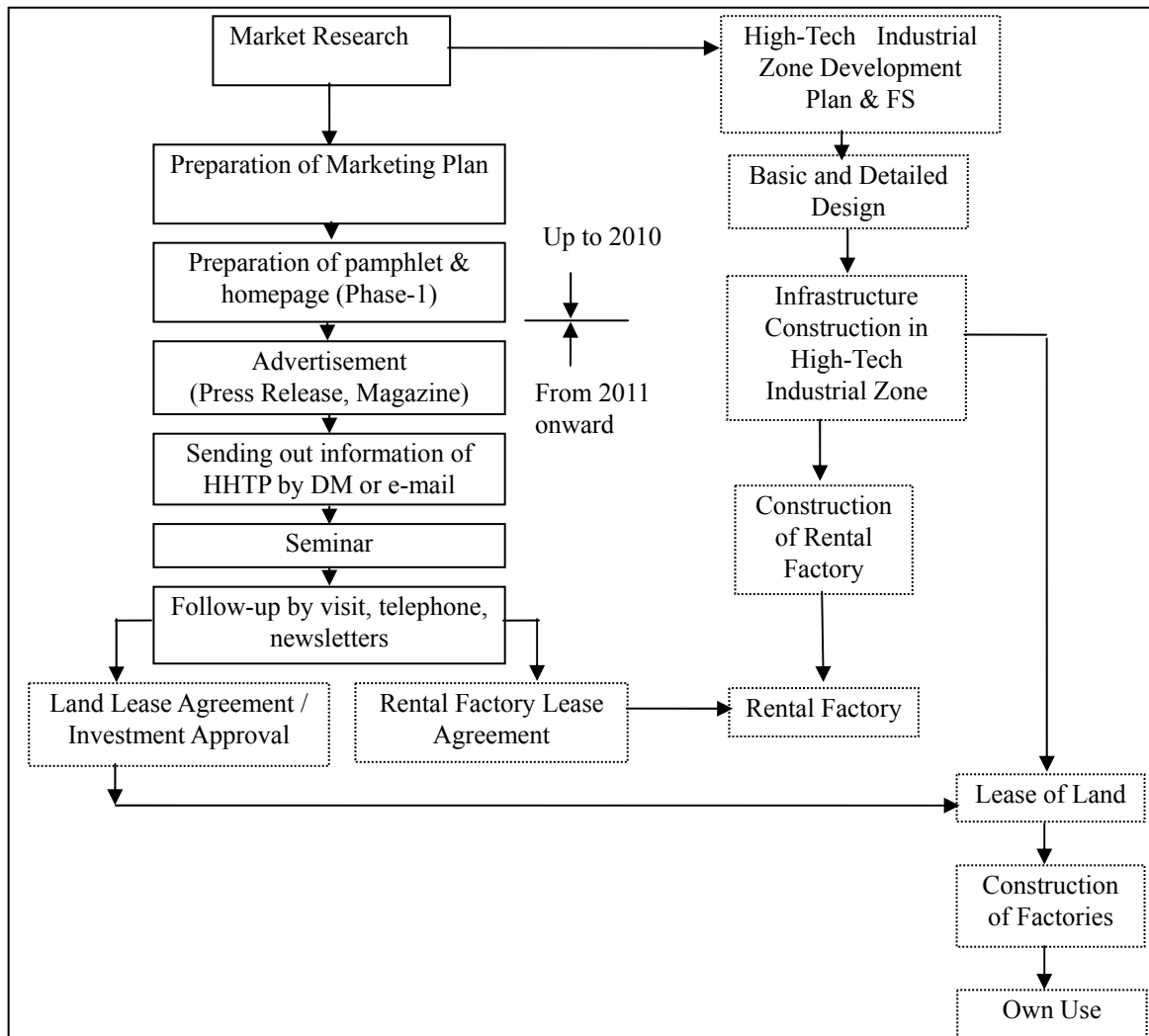
- 6) Transportation: Transportation to port and airport will be drastically improved around 2012 after completion of road construction projects. Consequently, difference with general industrial parks located on the east and north of Hanoi will be smaller than at present.
- 7) Infrastructure: In order to compete with the international-level industrial parks in Northern Vietnam, it is desirable to have infrastructure that is in no way inferior to such industrial parks. It is crucial to have advanced infrastructure such as high-speed communication and a stable supply of electricity.
- 8) Procedure: It is necessary to simplify the various procedures that investors need to carry out.
- 9) Land available for lease: A area of 34.5 ha was given to the State-1 development company for high-tech industrial zone. Out of this 34.5 ha, 7 ha has already been allocated to three investors to date. The remaining 27.5 ha includes some portions that will be difficult to attract investors due to their irregular shape. It is necessary for one development company to take responsibility of the enter high-tech industrial zone, so that land rearrangement can be executed smoothly to improve the land shape.
- 10) Timing of sales promotion and zone development: In most industrial parks developed by Vietnamese companies, land preparation and infrastructure construction are started only after investors make an investment decision. However, some foreign investors do not accept such development for the following reasons:
 - Investors cannot make an investment decision until they trust how the lot is prepared for their factory, even if they are presented with a beautiful picture.
 - After making an investment decision, investors wish to start factory construction to commence commercial operation as soon as possible. In reply to a questionnaire survey conducted by the Ministry of Economy, Trade, and Industry of Japan (METI), Japanese investors indicated the required number of days from site selection to factory construction as shown in Table 7.5-4. When they build a factory in foreign countries, the number of days may differ from such reply. It is required to complete land preparation and infrastructure construction in the zone before potential investors visit the site, otherwise it is difficult to impress them.

The high-tech industrial zone may be the economic heart of HHTP with the largest area. It is necessary to execute infrastructure construction, sales promotion, and arrangement of organization and institutions, keeping pace with external environmental changes.

Table 9.7-1 Required Number of Days for Factory Construction in Japan

	Number of days
Site selection	203
From land agreement to commencement of factory construction	133
From commencement of factory construction to start of commercial operation	178

Source: The study of investment trend in Japan (METI)



Source: JICA Study Team

Figure 9.7-3 Sequence of Sales Promotion for the High-Tech Industrial Zone

The HHTP Development Company is needed to take the initiative in sales promotion of the high-tech industrial zone, under the supervision of the HHTP-MB. The company is required to focus on the following activities for the period of 2007-2009.

- To finalizing the development company, and make a single company integrating the development company for Stage-1 and complete the remaining construction work for roads, bridge, and land preparation.
- To continue sales promotion for Stage-1 and provide better customer service to produce a good reputation among existing tenants
- To prepare a development plan for the zone, and execute the initial steps of

Phase-1 sales promotion including market research and marketing plan preparation in line with the sequence shown in Figure 7.5-7.

9.7.5 Continuation of Incubation Services

Incubation services will contribute to the regional economy through encouragement of new business. The HHTP-MB has already started incubation service at HHTP. After State research institutes and universities are established in and around HHTP, it will be attractive location for venture companies.

It is important to continue the incubation services to support start-up activities of the venture companies. In addition to the incubation institution that provides the space for rental offices or laboratories for the venture companies, the HHTP-MB is required to employ incubation managers to support the venture companies.

9.7.6 Projects to realize the Strategy

Based on the above considerations on the strategy for high-tech industrial function, the following projects are required for realization as well as other projects envisaged for other strategies.

- 1) Provision of tax incentives
- 2) Improvement of one-stop services and custom clearance
- 3) Provision of testing and analysis services
- 4) Provision of rental factories for SME
- 5) Formulation of a well-thought-out marketing plan
- 6) Marketing activities in line with the marketing plan
- 7) Continuation of incubation services in HHTP

9.8 Attraction of Education and Training Function

9.8.1 Education and Training for the Manufacturing Industry

Human resources are an import factor for manufacturers to invest in any industrial park. Therefore, the HHTP-MB is required to firstly know what education and training are desired by customers, and then attract the right kinds of institutes for customer-oriented training of high-tech engineers, technicians, and skilled-workers.

(1) Education and Training Desired by Customers

The Study Team investigated what education and training are required by Japanese investors based on the two surveys:

- 1) Actual condition survey of Japanese manufacturers in Asia that was conducted by JETRO during November 27 to December 27, 2006. The questionnaire survey was included 2,069 Japanese manufacturing company affiliates in six countries in ASEAN (Thailand, Malaysia, Singapore, Indonesia, Philippines,

and Vietnam), and India. The response rate was 40.1%.

- 2) The Study Team interviewed several Japanese manufacturing company affiliates in Hanoi and HCM City, in April and May 2007.
- 3) The Study Team implemented a questionnaire survey of the Japanese industry..

According to the survey by JETRO, most respondents in Vietnam pointed out difficulty of local procurement of materials and parts (72.7%: much higher than ASEAN average 42.8%); increase in procurement costs (51.5%); and difficulty of quality control (47.0%), as is shown by Figure 9.8-1.

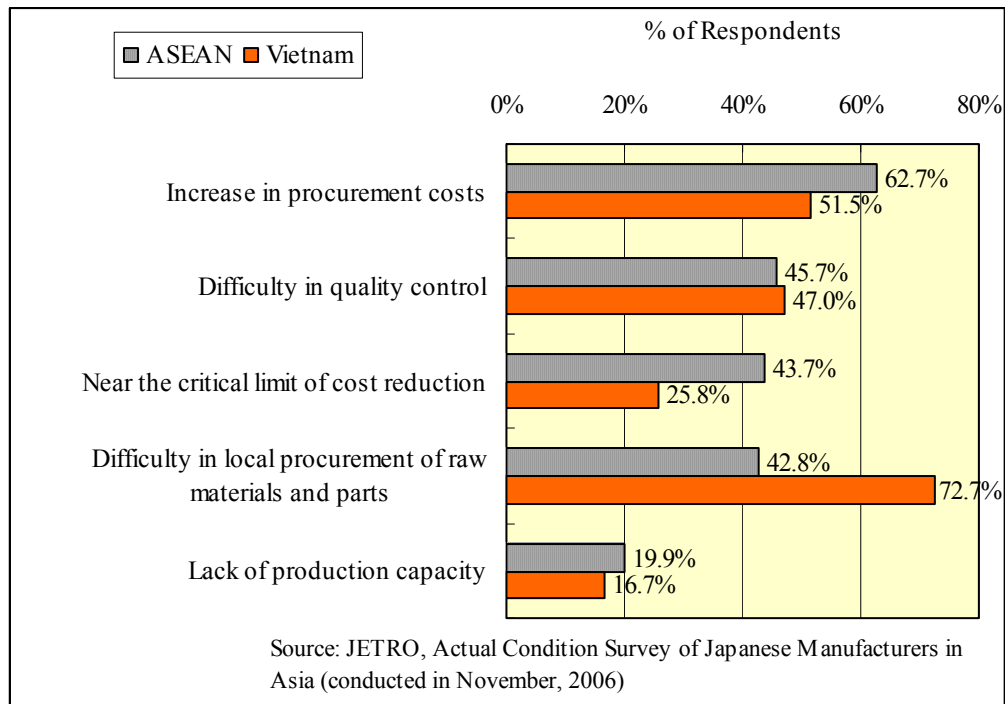


Figure 9.8-1 Production Problems in ASEAN & Vietnam

Due to lack of reliable local parts manufacturers, Japanese manufacturers reluctantly import parts, or invest in parts manufacturing plants in Vietnam. According to the interviews with two Japanese electronics manufacturers, they are currently assembling imported parts, but they will make some plastic parts and molds in their factory in Vietnam in the near future. Accordingly, it is necessary for them to train engineers and technicians in Japan for designing and manufacturing molds. The representatives of both manufacturers said that if there was a training center for mold fabrication in HHTP it would be very helpful for reducing the cost and time of employee training in parts manufacturing..

The ratio of respondents who pointed out difficulty in local procurement of materials and parts was 17.5% (Singapore), 33.8% (Thailand), and 38.2% (Malaysia); while it was 72.7% in Vietnam. The supporting industry is well developed in the three ASEAN countries to provide parts of reliable quality.

Figure 9.8-2 shows the methods of human resource development (HRD) provided by Japanese Manufacturers in ASEAN and Vietnam. Most respondents in Vietnam pointed

out OJT (64.7%); overseas training (64.7%); language training (42.6%); and training for special skills (41.2%).

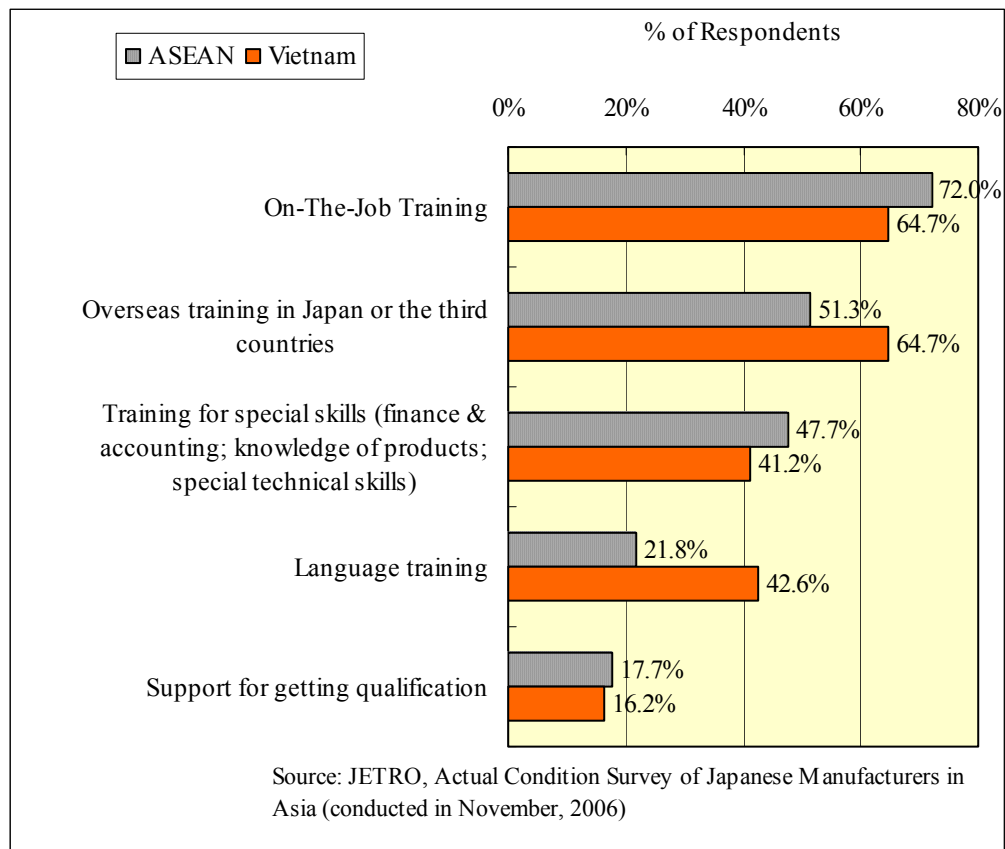
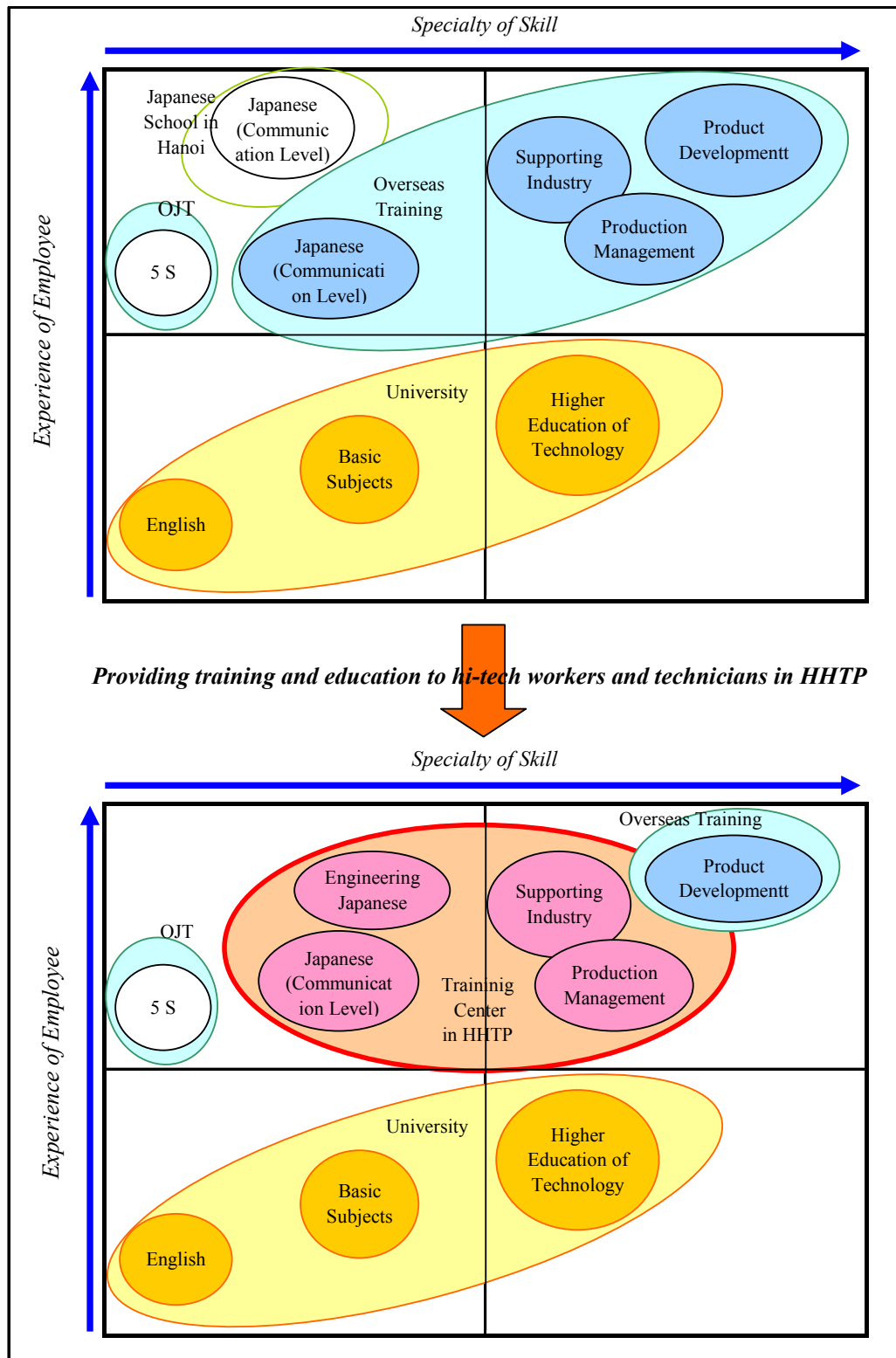


Figure 9.8-2 HRD by Japanese Manufacturers in ASEAN & Vietnam

Language training was conducted for employees by 42.6% of respondents in Vietnam. This ratio was the highest among the six ASEAN countries and India. In the interviews conducted by Study Team, all Japanese representatives emphasized the necessity of Japanese language training course, especially for engineering-level Japanese. Without language training, it appears difficult for employees to participate effectively in the overseas training, special skill training, and communication with foreign experts in the local and mother factories for daily operation.



Source: JICA Study Team

Figure 9.8-3 Strategic Training Program of Hi-tech Workers

Accordingly, the following are required in HHTP.

- Supporting industry
- Production management
- Language, especially Japanese

Figure 9.8-3 shows a strategic training program for high-tech engineers and technicians,

which is recommended to achieve customer satisfaction on the basis of the above surveys with Japanese Manufacturers.

(2) Practical Example of Industrial Human Resource Development in Thailand

As a guide to industrial human resource development in HHTP, a practical example in Thailand is briefly introduced here.

1) Technology Promotion Association Thailand-Japan (TPA)

The TPA was established in Thailand in 1973 by the young who had experiences in studying in Japanese universities or taking part in classes the Association of Overseas Technical Scholarship (AOTS). The purpose of starting the TPA was the introduction and spread of Japanese leading-edge technology. Since then, the TPA has performed various activities such as holding technical and business seminars; publishing books and correspondent education on industrial technology; providing language training of Japanese, Thai, English, Chinese, etc.; providing calibration services for measuring instruments; providing services of environmental analysis; providing consultancy services; and promoting information technology.

2) Thai-Nichi Institute of Technology (TNI)

In 2003, some 30 years after its establishment, the TPA decided to establish a Japanese-style Institute of Technology named TNI in Bangkok.. In August 2007, TNI was officially opened.

An outline of TNI is presented here:

Faculty and Department

Table 9.8-1 Faculty and Department of TNI

Faculty	Department	Opening
Engineering	Automotive engineering	2007
	Industrial engineering	2008
Information	Information technology	2007
	Computer engineering	2008
Business Management	Industrial control	2007
	Development and management of human resource	2008
Graduate School	Industrial control (master course)	2007

Source: TPA and JICA Study Team

Campus

- Land: approximately 1.5 ha
- Gross floor area: approximately 10,000 sq. m, with a capacity of 3,000 persons
- Construction fund: approximately US\$ 13 million by own fund of TPA

Feature of Curriculum

- All students learn Japanese language.
- To focus on practical on-site training in collaboration with the industry
- To bring up students with executive and practical skill and knowledge

- To have both daytime and evening classes
- To focus on highly demanded fields in Thailand (automobile, electrical, electronic, and communications technologies)

Teaching Staff

Experts of various fields, especially those having experience in studying or training in Japan; Japanese experts retired

Expected Collaboration from Japanese Enterprises

- Provision of scholarship
- Provision of equipment and materials necessary for practical training
- Dispatch of experts as teaching staff
- Provision of opportunities for practical training at factories
- Provision of trainers for on-the-job training
- Employment of graduates

9.8.2 Education and Training for the Manufacturing Industry in HHTP

Educational and training institutes as shown in Table 9.8-2 are required to be established in and around HHTP so that the high-tech manufacturers have opportunities for employing new engineers, technicians and skilled workers and also opportunities for employee training.

Table 9.8-2 Education and Trainings for the Manufacturing Industry

Type of Training	Type of High-Tech Workers		
	Theory	Skill	
	Engineer	Technician	Skilled Labor
Educational Institutes	VNU (adjacent to HHTP)	Institute of Technology	Vocational Training School
Employee Training	Technical Training Center in HHTP	Technical Training Center in HHTP	Technical Training Center in HHTP

Source: JICA Study Team

The College of Technology in VNU is scheduled to be relocated to the area adjacent to HHTP by 2010. In addition, it is recommended to establish an institute of technology to educate technicians in both theory and skill on the model of the above example in Thailand.

In order to educate skilled labor, it is recommended to establish a vocational training school as in the example of the Vietnam-Singapore Industrial Park.

For the employee training, it is recommended that a technical training center be established in HHTP. It is proposed that the HHTP-MB build the technical training center to attract foreign training institutes with abundant experience in technical training.

By taking the above measures for education and training, HHTP could have the comparative advantage over other industrial parks in Northern Vietnam for attracting

high-tech manufacturing investors. In addition, HHTP could have a strong ability for providing high-tech human resources to high-tech industries over the country and ultimately will facilitate Vietnam's development towards the industrialized country.

9.8.3 Education and Training for the Software Industry

HHTP has played an important role in the training and examination of IT engineers since VITEC and the Vietnam-Japan E-Learning Center were established in 2001. It is necessary to continue education and training of IT engineers to facilitate the sustainable development of the software industry in Vietnam.

As for the software industry, education and training in HHTP is expected to be led by FPT for the following reasons:

- FPT is the largest software company in Vietnam.
- FPT has already decided to build the main campus of FPT University in HHTP to educate IT human resource.
- FPT is assigned as HHTP Development Company with responsibility for infrastructure construction in Software Park and is allowed as an investor in Software Park.

Table 9.8-3 shows the educational and training institutes in and around HHTP for IT engineers.

Table 9.8-3 Education and Trainings for the Software Industry

Type of Training	IT engineers
Educational Institutes	FPT University (in HHTP), VNU (adjacent to HHTP)
Employee Training	IT school in HHTP (operated by the private sector)

Source: JICA Study Team

9.8.4 Education and Training for R&D

Higher educational institutes such as universities and graduate schools are educational institutes for S&T human resources. It is necessary to enrich such higher education, taking social needs into consideration.

In addition to the S&T staff, education for management of technology (MOT) will be required, as S&T activities will be more and more complex.

It is important to apply fruit of S&T to the economic activities. The following human resources also need to be developed and recruited.

- Coordinators for industry-academy-research linkage
- Experts who find the technical seeds to match them with the social needs
- Experts in intellectual property right
- Specialists in incubation

9.8.5 Projects to realize the Strategy

Based on the above considerations on the strategy for education and training function, the following projects are required for realization.

- 1) Request for government initiative in relocation of VNU as scheduled
- 2) Establishment of Institute of Technology in HHTP
- 3) Establishment of vocational training school in HHTP
- 4) Establishment of Technical Training Center in HHTP by attracting foreign investors
- 5) Relocation of FPT University
- 6) Establishment of the educational institute of MOT
- 7) Training of various experts to apply the fruits of S&T to economic activities
- 8) Establishment of IT schools in HHTP

9.9 Popularization Function of Science and Technology

9.9.1 The Tsukuba “Brand” and Expo ‘85

Up until the mid 1970s or so, most people’s impression of Tsukuba was of a collection of research organizations. However, Expo ’85 helped to give the city a progressive, international image. In fact, the brand has been built to such an extent that many industrial parks and companies far from the city use “Tsukuba” in their name.

Expo ’85 is an event that accelerated the development of Tsukuba and built the Tsukuba “brand”.

9.9.2 Popularization of Science and Technology to be performed in HHTP

HHTP can adopt the following methods of popularizing science and technology:

- Build a science museum
- Hold events of science and technology in HHTP
- Send science and technology information from HHTP

The popularization is aimed at enhancing the nation’s understanding and interests in S&T as well as creating the HHTP brand as the S&T city.

(1) Science Museum

It is proposed that a science museum be built in HHTP to use for permanent exhibits and as a site for S&T events shown below.

(2) S&T Events

Many scientific events can be held at the science museum. The following are possible examples.

- Science fairs for children during the school holiday, at which mainly children and other age brackets can experience and observe S&T.
- For young people, lectures by inviting the world's top scientists including Nobel Prize winners, to provide opportunities to be exposed to cutting-age science.
- For young people to continue to participate in the mathematics Olympic Games and robot contests. It is proposed that such events be held in HHTP as the Asian-Pacific Robot Contest held at Quan Ngua in Hanoi in August 2007.
- It is proposed to hold a science exposition in HHTP after making adequate preparation.

9.9.3 Transmission of S&T Information

It is proposed to send S&T information from HHTP to enhance the nation's understanding and interest in S&T and to help raise the recognition of the HHTP name.

- It is important that scientists and their research institutes send information from HHTP via various media so that the nation could enhance understandings of S&T and children take the opportunities afforded by the information to select appropriate courses for becoming scientists.
- Mediators have important roles to present S&T information to the nation in an understandable way because S&T is normally hard to understand. It is required to nurture science journalists, illustrators, and animators; and to enhance the public relation activities of research institutes.
- It is proposed to prepare a technological strategy map that shows, with illustrations, how S&T will be developed and will influence the nation's life and national economy in the target year. The map will help the nation to understand S&T in an easy-to-understand way.
- It is important to transmit the past S&T achievements via homepages, biography, films, etc.

9.9.4 Projects to realize the Strategy

Based on the above considerations on the strategy for popularization function of science and technology, the following projects are required for realization.

- 1) Construction of a Science Museum in HHTP
- 2) Organizing various events in HHTP for enhancing the nation's understanding and interests in S&T and raising name recognition of HHTP
- 3) Sending S&T information from HHTP to enhance the nation's understanding and interests in S&T and to enhance name recognition of HHTP

9.10 Generation of Synergy Effect

9.10.1 Considerations of Synergy Effect

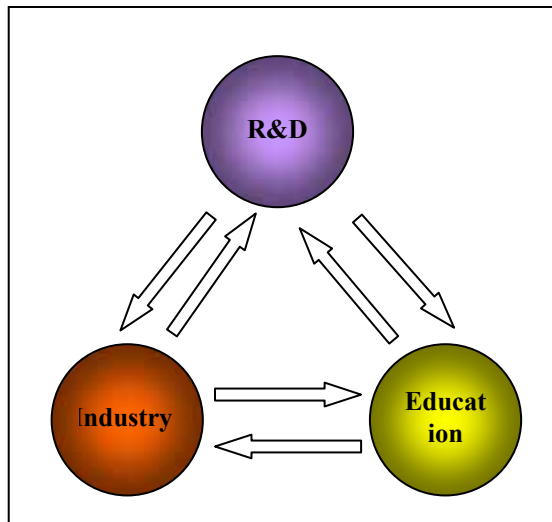


Figure 9.10-1 Industry-Education-R&D Synergy

The industry-education-R&D synergy needs to be emphasized to achieve the goals set out for industrial upgrading of Vietnam. As HHTP has a mission to provide this synergy, the following three points are examined.

- What synergy is expected in HHTP?
- When will such synergy arise?
- What measures are required to develop the synergy?

9.10.2 Expected Synergies and Time Frame

Table 9.10-1 shows the expected synergies and time frame. There is a long lead time for R&D to generate new technologies. Therefore, the State research institutes need to become established or relocated in HHTP as soon as possible as mentioned previously.

Table 9.10-1 Expected Synergy in HHTP

Synergy			Expected Time Frame			
From	To	Description	2007-2009	2010-2012	2013-2020	2021-
R&D	Industry	(1) to improve Vietnamese products				x
		(2) to perform funded research	x	x	x	x
		(3) to develop new Vietnamese products from Hoa Lac				x
		(4) to organize new business by utilizing own technology				x
		(5) to participate in the joint R&D work			x	x
R&D	Education	(1) to guide new technology to HRD	x	x	x	x
		(2) to strengthen research capability of university			x	x
Industry	Education	(1) to provide opportunities for HRD business			x	x
Industry	R&D	(1) to make equipment and tools for R&D work		x	x	x

Synergy			Expected Time Frame			
From	To	Description	2007-2009	2010-2012	2013-2020	2021-
		(2) to make prototype for commercializing the fruits of R&D work				x
Education	R&D	(1) to provide graduates with research work		x	x	x
		(2) to train technicians for making equipment and tools for R&D works		x	x	x
Education	Industry	(1) to train technicians for making parts and materials needed by industry		x	x	x
		(2) to provide graduates to the high-tech enterprises		x	x	x
		(3) to provide Japanese language training for engineers		x	x	x
		(4) to provide many skilled workers			x	x
Industry	Industry	(1) to undertake joint work between manufacturing and software industries			x	x
		(2) To undertake joint work by foreign and Vietnamese industries				x

Source: JICA Study Team

Education may give a large contribution to industry and R&D, if the following measures are taken:

- To accelerate land acquisition for FPT University to build its campus as scheduled.
- To remove the current barrier for relocating VNU adjacent to HHTP as scheduled, and set up scholarship to employ highly-capable graduates at HHTP.
- To set up the Technical Training Center, where industrial employees will be given training in parts and materials manufacturing by highly skilled manufacturers; and in Japanese language.
- To set up an institute of technology and vocational training school so as to provide the tenants in HHTP with technicians and skilled workers, respectively.

9.10.3 Measures for Generating Synergies

(1) Enhancement of Information Exchanges

It is important to share common perceptions among industry, education, and R&D in order to strengthen linkages of between one another. From this point of view, education and State research institutes are required to disclose their own achievements and to transmit information by the following means.

- Holding meetings for announcing the achievements
- Publication of journals such as annual reports
- Presentation of papers to academies or academic journals
- Disclosure of State patents

It is also important to assemble a database of R&D achievements mainly by MOST and

other related ministries, and to make the database widely available on the Internet..

(2) Promotion of Cooperative R&D

Recent activities in R&D are sophisticated and complicated to expand to boundary or multidisciplinary areas. In order to promote science and technology, it is important to promote cooperative R&D such as joint and entrusted research works. It is also important for MOST to build mechanisms to achieve cooperative R&D so that the limited resource for R&D can be used effectively.

Cooperative R&D is also important for technology transfer of achievements to the high-tech industry and reflecting the industrial needs into R&D activities.

(3) Promotion of Personnel Exchanges

It is important for MOST to promote the personnel exchanges to mutually supplement the functions of industry, education, and R&D institutes. Example includes the following:

- Industrial enterprise may undertake entrusted production of equipment and materials necessary for R&D activities
- Researchers from research institutes can give lectures to students of the university in HHTP.
- Research institute can employ graduates from the universities in HHTP.
- Foreign industrial enterprise can dispatch technical experts to universities in HHTP, for example, the Institute of Technology, as lecturers.
- Industrial enterprises can cooperate in the practical training of students in universities and the Institute of Technology by providing use of their manufacturing facilities and trainers.

In addition, it is proposed to create a mechanism for giving awards to parties who generate successful results by linkages among industry, education, and R&D.

(2) Provision of Financial Supports

It is desirable to promote the exchanges with financial supports from high-tech enterprises, for example:

- Provision of scholarship to students in HHTP
- Provision of equipment and materials necessary for practical training performed in educational institutes in HHTP

Such financial supports will be effective not only for the students and educational institutes, but also for the high-tech enterprises who want to employ deserving students for financial supports.

9.10.4 Projects to realize the Strategy

Based on the above considerations on the strategy for generation of synergy effects, the following projects are required for realization:

- 1) Enhancement of Information Transmission
- 2) Promotion of Cooperative R&D
- 3) Promotion of Personnel Exchanges
- 4) Provision of Financial Supports

Chapter 10 ROAD MAP FOR IMPLEMENTING MASTER PLAN

10.1 Development Scenario

Considering the development condition of each sector, it will take time to realize the strategy of HHTP. It is necessary to develop through a stage-wise concept as follows.

10.1.1 Take-Off Stage (now on until implementation of the further basic infrastructure construction work)

The land acquisition has been conducted initially for Stage-1 development with a total area of 200 ha. A part of the basic infrastructure has been constructed and a Start-Up Center was built by the HHTP Management Board. Three high-tech industry tenants are in operation. Land acquisition work is still on-going and an additional 70 ha of land has been acquired.

Since big movements in the physical development are not envisaged for the next several months, this period is defined as a take-off stage, in which all necessary preparatory works should be conducted for better launching of the HHTP's development.

The necessary development activities to be undertaken in this stage are as follows and are indicated in Figure 10.1-1 below.

- Restructuring of HHTP-MB to implement, operate, manage and support the HHTP development with cooperation with related ministries, under a direct control by the Prime-Minister.
- To establish a HHTP development company which covers whole land of HHTP
- Preparation of all necessary incentives for all sectors related to HHTP.
- To support establishment or relocation of R&D institutes who hope to enter HHTP.
- To support relocation of FPT University to Education and Training Zone.
- To provide sufficient services to the current tenants.
- To concentrate on promotion, marketing and attraction for new high-tech investors to Stage-1 site with remaining area over 40 ha.
- To acquire and resettle remaining land for Phase-1 development of about 540 ha.
- To implement further infrastructure development works of Phase-1, both for common and zonal infrastructures.

Since current demand for the urban functions required for a human life is not remarkable in this short period of the Take-Off Stage, HHTP will depend on Hanoi and existing facilities in surrounding areas for these functions.

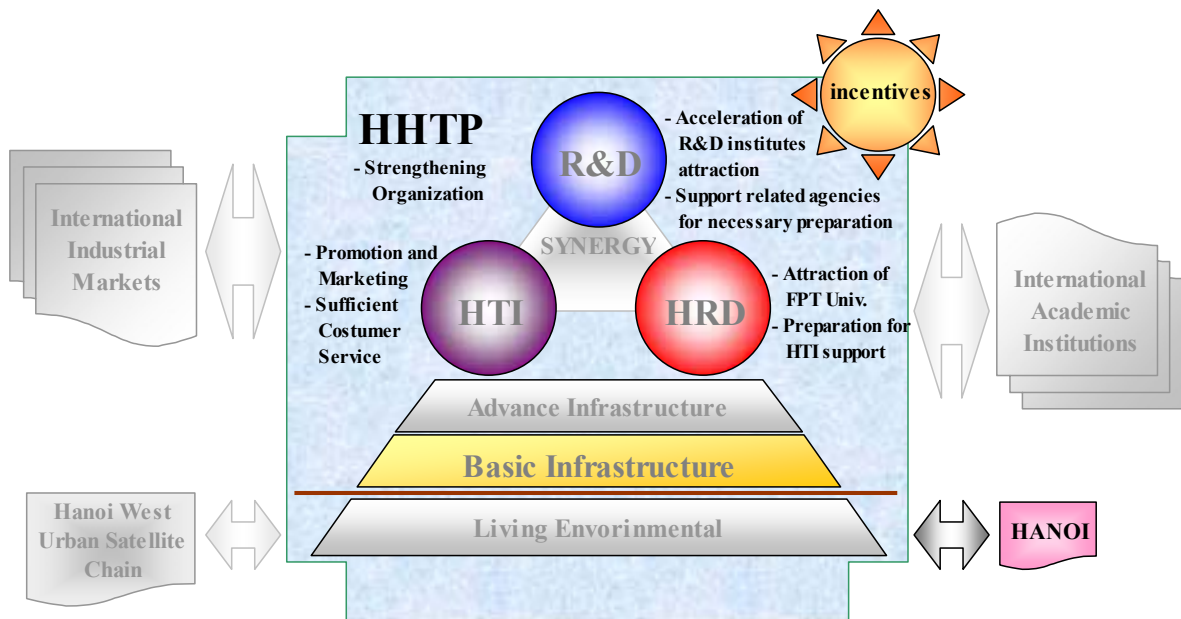


Figure 10.1-1 Development Activities for Take-Off Stage

10.1.2 Young Stage (after take-off stage until year 2012)

The basic infrastructure and some advanced infrastructure will be developed in this stage and it is indispensable to establish technical training center and state research institutes by related ministries.

On the other hand, from strategic marketing point of view, it is necessary to induce an “anchor tenant” which will have an influence on the whole high-tech sector in the Park. The impact and benefit of an anchor tenant induction is well known worldwide, and the prestige of HHTP will be greatly raised by attracting such anchor tenant.

The necessary development activities to be undertaken in this stage are as follows and are indicated in Figure 10.1-2 below.

- To start construction of first track R&D institutes, and continue to support R&D institutes who are willing to enter HHTP.
- To construct and start operation of FPT University, moreover to prepare further expansion plan and its implementation.
- To consider other training organization and facility to support the activities in HHTP.
- To continue promotion, marketing and attraction for high-tech investors to Phase-1 site with total area of 140 ha.
- To provide sufficient services to the current tenants, such as one-stop service.
- To construct infrastructure of Phase-1 development, both for common and zonal infrastructures.
- To acquire and resettle land for Phase-2 development of about 800 ha.

At the young stage, HHTP will have been equipped with acceptable urban functions to some extent. However, it will continue to develop by sharing some of the urban functions of the capital city of Hanoi, since a self sufficient environment will still be in

progress. The conceptual scheme in this development stage is illustrated in Figure 10.1-3.

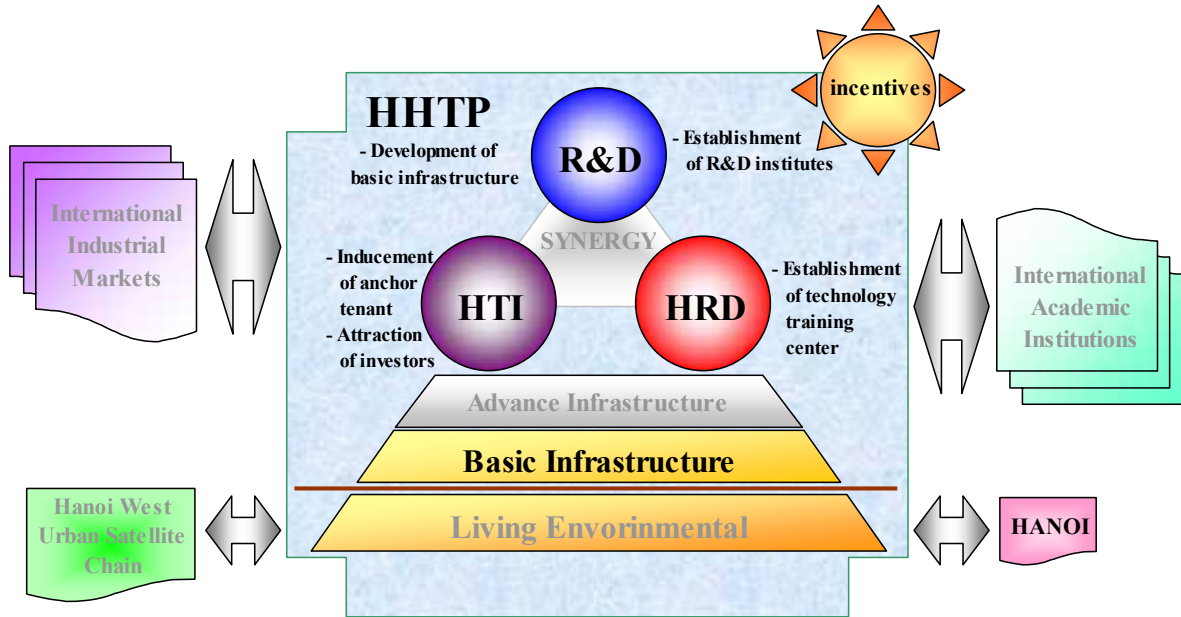


Figure 10.1-2 Development Activities for Young Stage

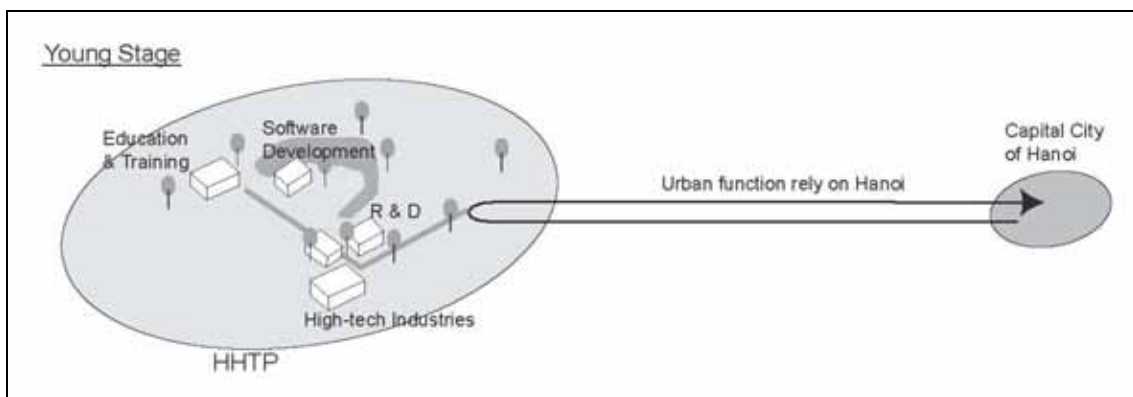


Figure 10.1-3 Conceptual Scheme for Young Stage

10.1.3 Boost Stage (after young stage until year 2020)

The development of HHTP is to be accelerated in line with the progress of the overall basic and advanced infrastructure development and some establishment of each sector, which includes R&D institutes, high-tech industries and FPT University, as well as implementation of a program to support high-tech industry.

A key success factor of this stage will be to establish a symbolic “flagship facility” which will raise the brand name of HHTP. It is expected that this facility will help to visualize a development image of HHTP and play an important role in attraction of stakeholders concerned. High-tech enterprises, academic and/or educational organizations (e.g.: university, laboratory), hotels and convention centers, etc. are the candidate facilities for this.

HHTP will strongly attract brilliant young technology and science talents from all areas of Vietnam and this movement will accelerate the development of HHTP and bring up

the HHTP as a holy place for science and technology development. The synergy effect between HTI and HRD will be realized to some extent in this Stage.

The necessary development activities to be undertaken in this stage are as follows and are indicated in Figure 10.1-4 below.

- To continue to attract and support R&D institutes.
- To attract further education and training organization.
- To attract anchor-tenant into high-tech industrial park.
- To continue promotion, marketing and attraction for high-tech investors.
- To provide sufficient services to the current tenants and support to develop the synergy between R&D and education /training functions.
- To construct infrastructure of Phase-2 development, both for common and zonal infrastructures.
- To provide sufficient living environment, which consists of housing, supporting facilities, public facilities, and other symbolic flagship facilities such as science museum.

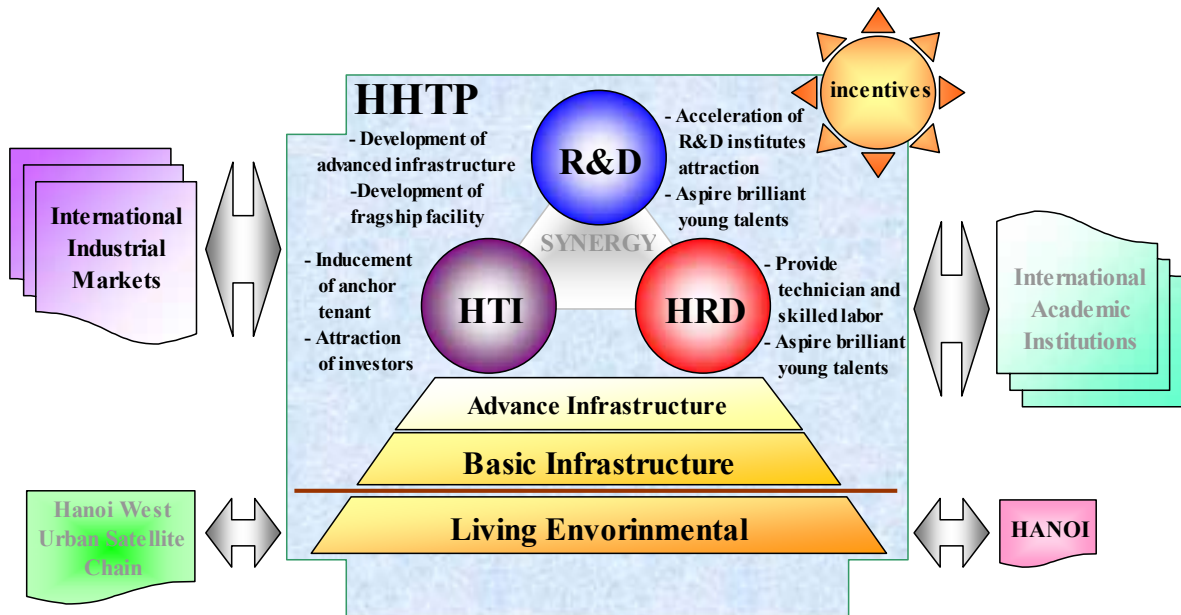


Figure 10.1-4 Development Activities for Boost Stage

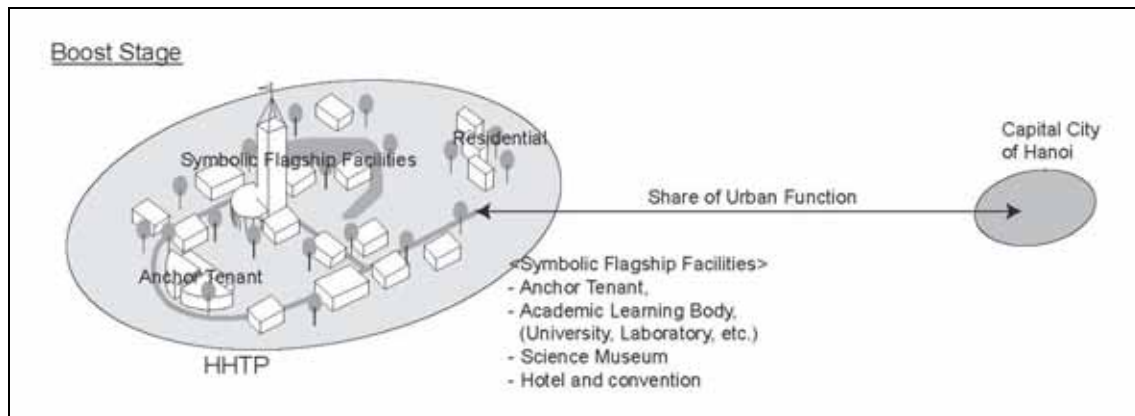


Figure 10.1-5 Conceptual Scheme for Boost Stage

The conceptual scheme in this development stage is illustrated in Figure 10.1-5.

10.1.4 Maturation Stage (after Boost Stage and beyond)

In the Maturation Stage, HHTP will have become self sufficient by fulfillment of R&D, HTI, HRD (training and education zone) facilities and urban facilities. In this regard, supporting public facilities are essential to complement the necessary functions of HHTP. Especially, social facilities (education and medical are key facilities) and adequate commercial and recreational facilities which support a high standard of life are indispensable.

At this final stage HHTP will have become a self sustainable city and a northern national center for high-tech development with sufficient urban functions. And HHTP will be an attractive city which absorbs the high-tech industries and population of the capital, Hanoi.

Moreover, the synergy effect between R&D, HTI and HRD, as shown in Figure 7.4-1 above, will have been realized and HHTP will act as a “National Center of Science and Technology Development”.

Furthermore, the innovations created in HHTP will be promoted extensively throughout the country and stimulate the development of high-tech industries to help attainment of the envisioned socio-economic development of Vietnam.

The conceptual scheme in this development stage is illustrated as below.

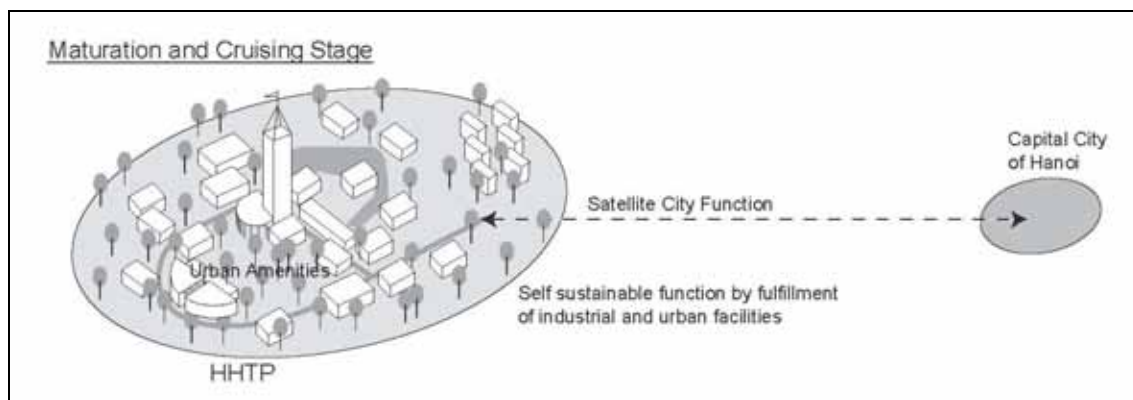


Figure 10.1-6 Conceptual Scheme for Maturation Stage

10.2 List of Proposed Projects

Table 10.2-1 shows all the projects/programs proposed in the Chapter 9. In each strategy, multiple projects which will materialize strategy are identified. In total, 39 projects are identified and these projects are classified into 3 categories, namely 1) prerequisite project, 2) essential project, and 3) other project. The prerequisite project is the project that is indispensable for the implementation of the HHTP and the essential project is the project that is important and necessary to be carried out for the successful implementation of the HHTP. Other project is the project that heightens the value of HHTP.

Table 10.2-1 List of Proposed Projects

Strategy		Projects	Implementation Agency	Prerequisite Project	Essential Project	Other Project
A	Land acquisition and infrastructure	A1	Land acquisition and resettlement	Ha Tay province	X	
		A2	Development of common infrastructure and R&D zone	HHTP-MB	X	
		A3	Development of functional zones other than R&D zone	HHTP-DC		X
		A4	Development of power supply without blackout	EVN / HHTP-MB	X	
		A5	Development of High-speed Telecommunication / internet system	MPT	X	
		A6	Development of Missing Part of RR-3	MOT		X
B	Government Initiatives	B1	Strengthening of the HHTP-MB by positioning directly under the Prime Minister	GOV	X	
		B2	Attraction of State research institutes at the government initiative	GOV/ HHTP-MB	X	
C	Project Organization	C1	Completion of the organizational structure	HHTP-MB/ HHTP-DC	X	
		C2	Capacity-building of the HHTP-MB	HHTP-MB		X
D	Provision of Human Resource	D1	Provision of employment service	HHTP-MB		X
E	Provision of Urban Function	E1	Provision of demand responsive housing and high-quality living environment	HHTP-DC/ Investors		X
		E2	Development of urban amenity core	HHTP-DC/ Investors		X

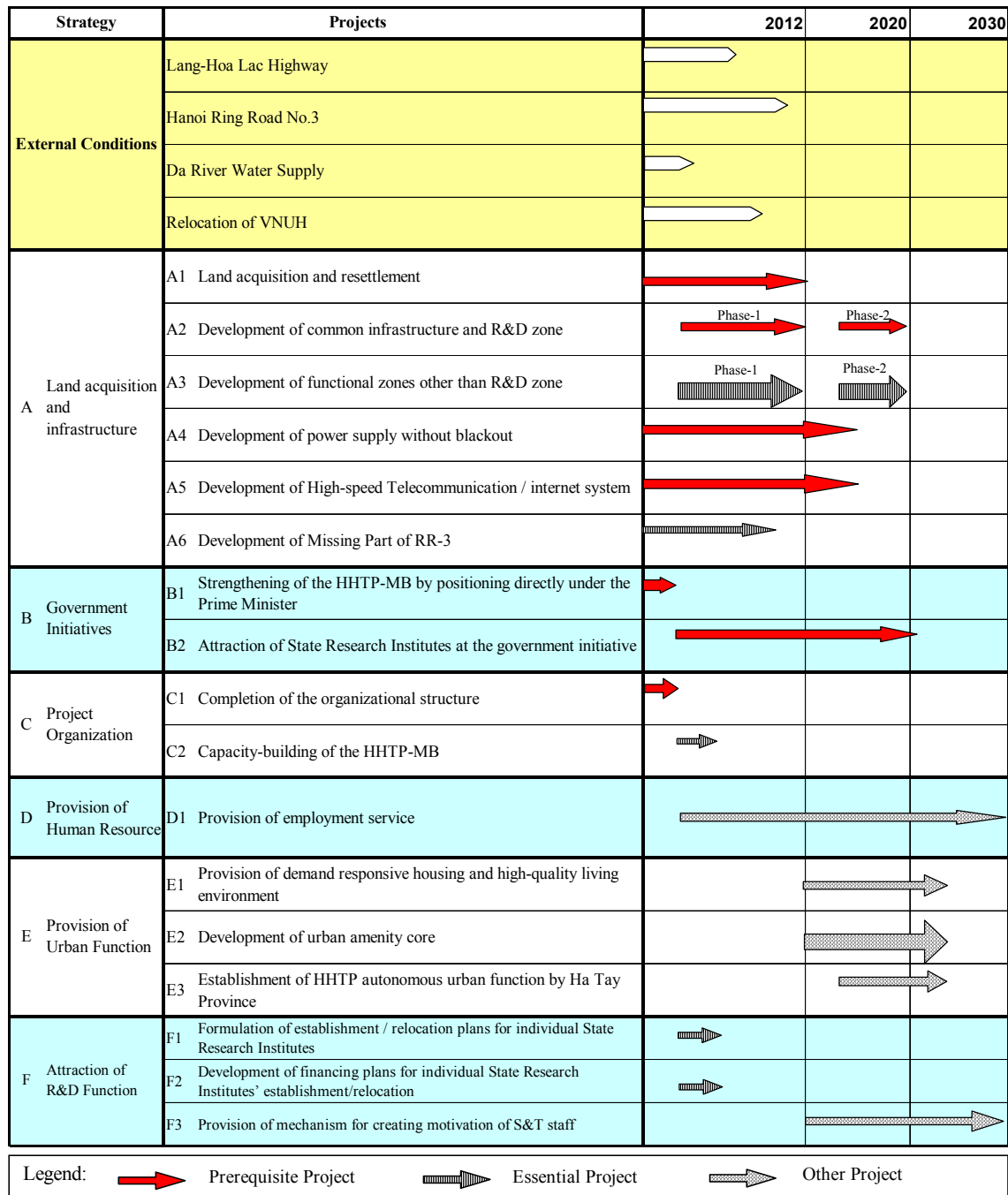
Strategy		Projects		Implementation Agency	Prerequisite Project	Essential Project	Other Project
		E3	Establishment of autonomous urban function	HHTTP-MB/ Ha Tay prov.			X
F	Attraction of R&D Function	F1	Formulation of establishment / relocation plans for individual State research institutes	GOV/research institutes/ HHTTP-MB		X	
		F2	Development of financing plans for individual State research institutes' establishment /relocation	GOV/MPI/ research institutes/ HHTTP-MB		X	
		F3	Provision of mechanism for motivating of S&T staff	GOV/MOST/ MPI			X
G	Attraction of High-tech Industrial Function	G1	Provision of tax incentives	GOV		X	
		G2	Improvement of one-stop services and custom clearance	GOV/ HHTTP-MB/ Ha Tay prov.			X
		G3	Provision of testing and analysis services	HHTTP-MB / HHTTP-DC			X
		G4	Provision of rental factories for SME	HHTTP-MB / HHTTP-DC			X
		G5	Formulation of the well-thought-out marketing plan	HHTTP-DC			X
		G6	Marketing activities in line with the marketing plan	HHTTP-DC			X
		G7	Continuation of incubation services in HHTTP	HHTTP-MB			X
H	Attraction of Education and Training Function	H1	Request for government initiatives in relocation of VNU as scheduled	GOV/ HHTTP-MB		X	
		H2	Establishment of Institute of Technology in HHTTP	HHTTP-MB/ HHTTP-DC Investors			X
		H3	Establishment of Vocational Training School in HHTTP	GOV/ HHTTP-MB/ HHTTP-DC			X
		H4	Establishment of Technical Training Center in HHTTP	HHTTP-MB/ HHTTP-DC/ Investors			X
		H5	Relocation of FPT University	FPT/HHTTP-MB/ HHTTP-DC		X	
		H6	Establishment of the educational institute of management of technology	GOV/research institutes/ HHTTP-MB/ HHTTP-DC			X
		H7	Training of various experts to apply the fruits of S&T to economic activities	MOST			X

Strategy		Projects		Implementation Agency	Prerequisite Project	Essential Project	Other Project
		H8	Establishment of the IT school in HHTP	HHTP-DC/ Investors			X
J	Popularization Function of Science and Technology	J1	Construction of Science Museum in HHTP	GOV/ MOST / HHTP-MB / HHTP-DC			X
		J2	Organizing various events in HHTP for enhancing the nation's understanding and interests in S&T and raising name recognition of HHTP	MOST/ Others			X
		J3	Sending S&T information from HHTP to enhance the nation's understanding and interests in S&T and raising name recognition of HHTP	MOST/ Others			X
K	Generation of Synergy Effect	K1	Enhancement of Information Exchanges	MOST/R&D Education/ Industry		X	
		K2	Promotion of Cooperative R&D	MOST/R&D Education/ Industry		X	
		K3	Promotion of Personnel Exchanges	HHTP-MB/ R&D / Education/ Industry		X	
		K4	Provision of Financial Supports	Industry			X

Source: JICA Study Team

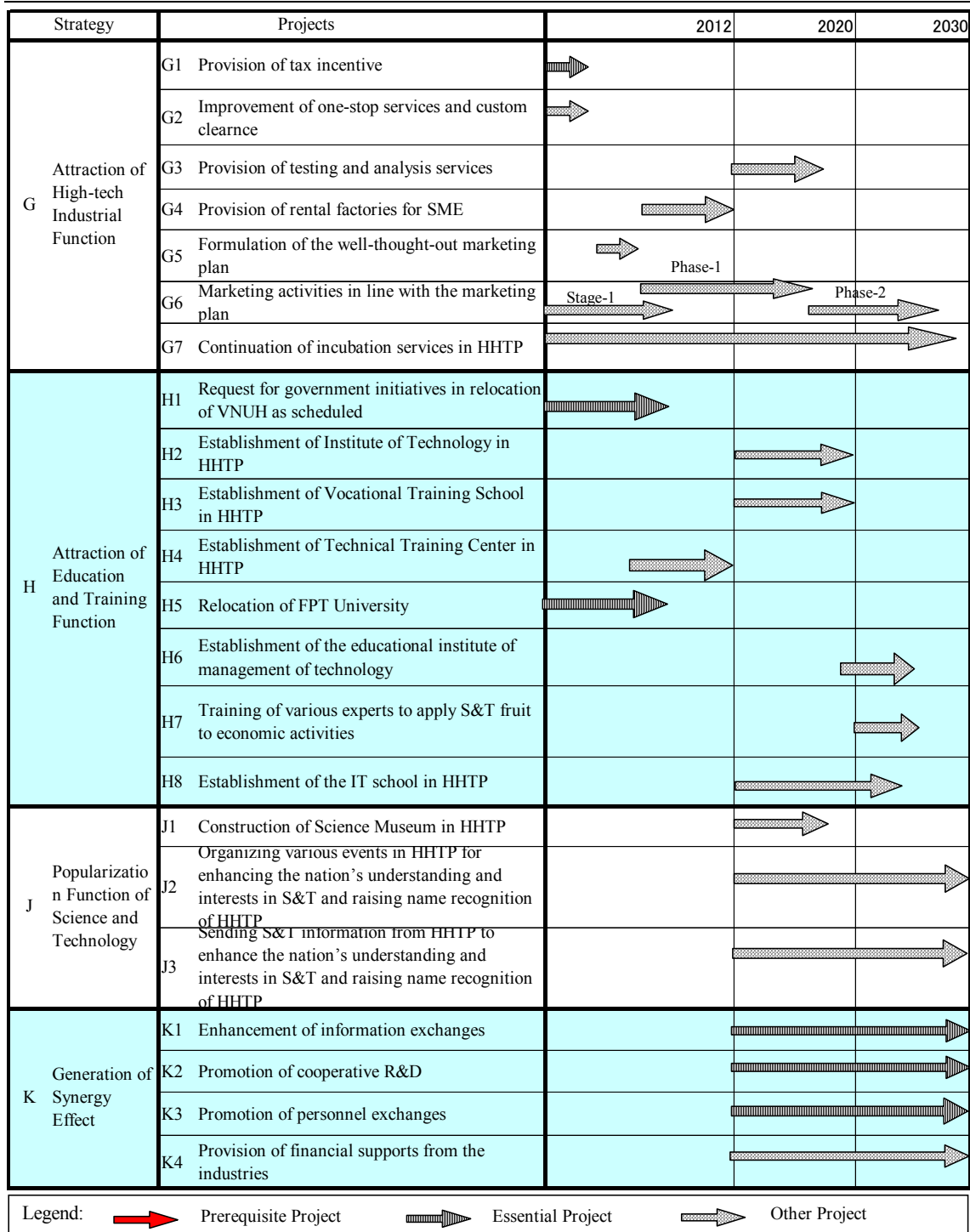
10.3 Road Map of the HHTP Development

A road map is prepared for strategies and projects as illustrated in Figure 10.3-1 and 10.3-2.



Source: JICA Study Team

Figure 10.3-1 Road Map of the HHTP Development (1/2)

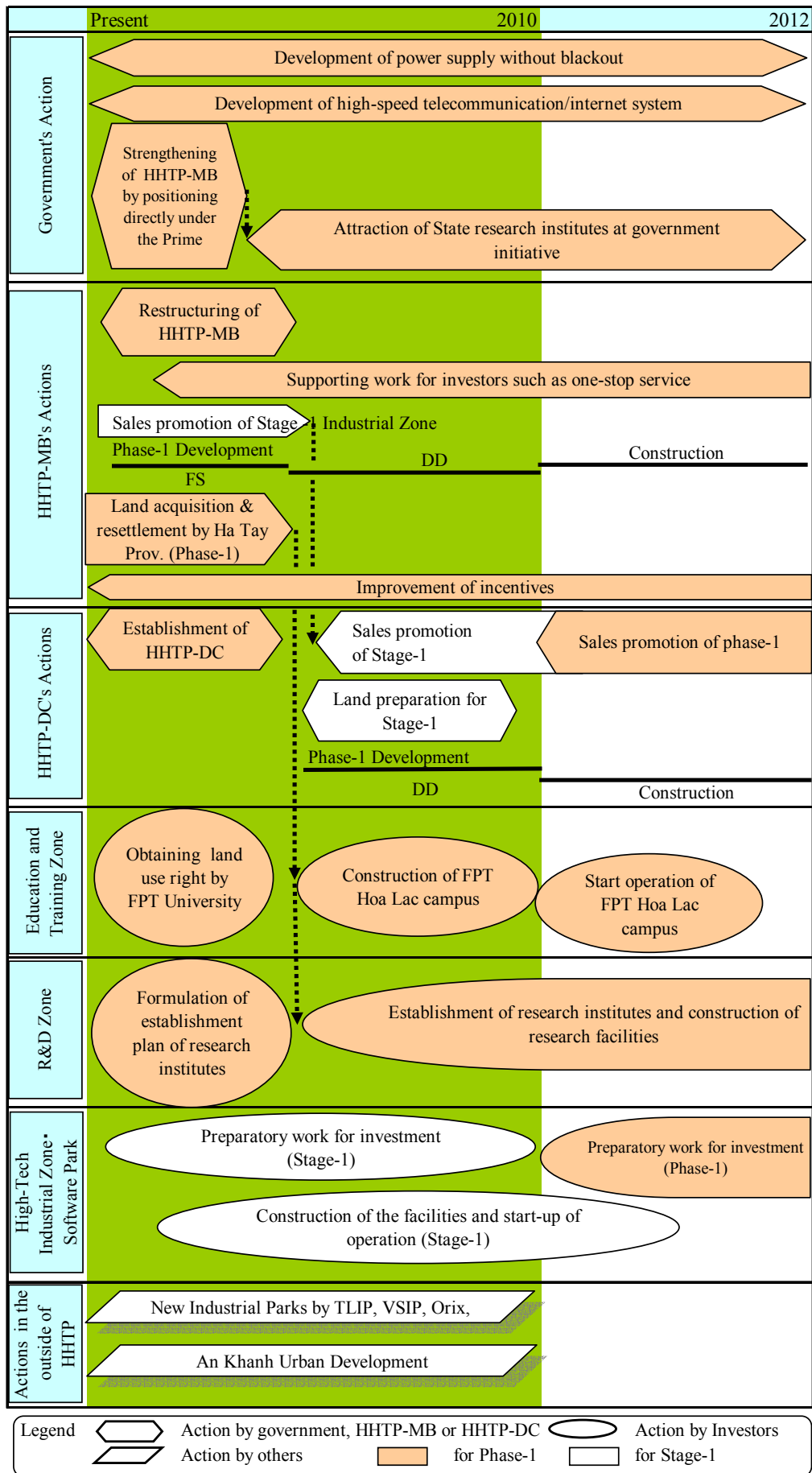


Source: JICA Study Team

Figure 10.3-2 Road Map of HHTP Development (2/2)

10.4 Action Plan by the End of 2012

Figure 10.4-1 shows the action plan by the end of 2012.



Source: JICA Study Team

Figure 10.4-1 Action Plan by the End of 2012

Chapter 11 PRIORITY PROJECTS

11.1 List of Infrastructure Projects

List of priority projects for the Phase-1 infrastructure development to support the function of HHTP are as shown in Table 11.1-1 below.

The maturities of the priority projects are different. Pre-feasibility studies are conducted for [Internal Common Infrastructure]. Some of the [Research Institute and Technical Training Center] is on-going and the [High Grade External Infrastructure] is still idea based projects, which are necessary to be handed over to the relevant authorities, e.g. power supply projects to Electricity of Viet Nam (EVN) and telecommunication project to Ministry of Post and Telecommunication (MPT).

11.2 Description of the Internal Common Infrastructure Projects

Internal common infrastructure projects which are located inside HHTP site are under responsibility of HHTP-MB. The projects consist of land preparation, drainage, road, water supply, power supply, sewerage, and pre-feasibility study for all of those are prepared.

The description of internal common infrastructure projects for Phase-1 development is as shown in the Table 11.2-1 below.

Table 11.2-1 Description of the Internal Common Infrastructure Projects

Sector	No	Project	Cost (mil. USD)	Description
Internal Common Infrastructure				
Transportation	01	Interchange and Intersection on the Lang-HoaLac Highway	13.8	1. Grade Separation (overpass) 2. Interchange (underpass)
Land Preparation	02	Partial Zonal Land Preparation	68.3	1. Land filling
				2. Land fill and cut
Road and Infrastructure	03	Arterial Road and Accompanied Infrastructure Development	81.4	1. Road
				a. type I
				b. type II
				c. type III
				d. bridge
				2. Drainage
				3. Water pipelines
				4. Sewer lines
				a. sewer lines
				b. pumping station
Water Supply	04	Water Supply Facilities	3.1	1. Water reservoir
				2. Pumping facilities
				3. Elevated water tank
Power Supply	05	Power Supply Facilities	14.4	1. Sub-Station (110/35/22kV)
				2. Ring Main Unit
Sewerage	06	Wastewater Treatment Plant	4.8	Construction of Waste Water Treatment Plant
TOTAL DIRECT CONSTRUCTION COST			185.8	

Note: The work quantities for land preparation cover all zones as a maximum case in the above table.

Project direct construction cost is estimated based on the following conditions and assumptions; however, these are subject to change in a later stage based on the further study/design result and market price.

1. The quantities of the works are roughly estimated based on the preliminary design.
2. The unit prices of the work are estimated based on the prices in the similar project and converted into 2007 current price.
3. Exchange rate: 1 USD = 120 JPY = 16,000 VND.
4. Price escalation, contingency, consultant fee, value added tax (VAT) and import tax are excluded.

11.3 Implementation Schedule

Implementation schedule for the internal common infrastructure development for Phase-1 is assumed as follow.

Work Item	2007				2008				2009				2010				2011				2012				2013				2014			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Master Plan	■	■	■	■																												
Approval for Master Plan				■																												
Feasibility Study & Environmental Impact Assessment					■	■	■	■																								
Approval for FS & EIA								■																								
Fund Arrangement								■	■	■	■	■																				
Consultant Procurement									■	■	■	■																				
Basic Design												■	■	■	■	■																
Field Investigations													■	■	■	■																
Technical/Detailed Design																■	■	■	■	■												
Approval of Technical/Detailed Design																	■	■	■	■												
Contractor Pre-Qualification																					■	■	■	■								
Tender/Procurement of Contractor																									■	■	■	■				
Construction Works (Common infrastructure)																													■	■	■	■
Construction Works (Land preparation)																																

Figure 11.3-1 Implementation Schedule

Table 11.1-1 List of Priority Project

Sector	No	Project	Area	Present Condition	Project Outline	Executing Agency
Internal Common Infrastructure						
Transportation	01	Interchange and Intersection on the Lang-HoaLac Highway	HHTP (Phase-1)	Interchange necessary to be constructed at the entering points from Lang-HoaLac Highway to HHTP, for traffic safety and to comply with the Vietnamese traffic law.	Construction of underpass and overpass	HHTP-MB (MOST [Ministry of Science and Technology])
Land Preparation	02	Partial Zonal Land Preparation	HHTP (Phase-1)	Necessary to provide "ready to build" conditions for investors and institutes. HHTP-MB responsible to prepare mainly for the major common infrastructure which does not belong to zonal development.	Land preparation (mainly land filling)	HHTP-MB (MOST)
Road and Infrastructure	03	Arterial Road and Accompanied Infrastructure Development	HHTP (Phase-1)	Part of the arterial roads and accompanied infrastructure have been constructed in HHTP (200ha of Phase1-Stage1), but not all of them are up to required standards. However, many of them are out of scope due to poor design and maintenance.	1.Construction of roads 2.Construction of drainage 3.Installation of water pipelines 4.Installation of sewer lines 5.Installation of power cables 6.Installation for telecommunications conduit	HHTP-MB (MOST)
Water Supply	04	Water Supply Facilities	HHTP (Phase-1)	Trunk Main (dia: 1,600mm) under Da River Water Supply Project (Phase-1: around 300,000m ³ /d, available from this August) is installed in front of the HHTP site. HHTP applying for water supply of around 20,000m ³ /d to VINACONEX (developer), however, only 12,000m ³ /d including the supply to PhuCat Industrial Park is supplied in Phase-1. More water supply is necessary for the entire area of HHTP.	1. Water reservoir 2. Pumping facilities 3. Elevated water tank	HHTP-MB (MOST)
Power Supply	05	Power Supply Facilities	HHTP (Phase-1)	The capacity of the existing sub station (110/35/22kV) is only 25MVA, and the capacity of the transmission line is only around 80MVA. The existing substation has no Bass Bars on both high and low voltages, which are necessary during maintenance-caused power cut. An additional sub station is necessary to avoid a blackout during maintenance period of a few weeks.	1.Sub-Station (110/35/22kV) 2.Ring Main Unit	EVN (Electricity of Vietnam)
Sewerage	06	Wastewater Treatment Plant	HHTP (Phase-1)	A wastewater treatment plant(6,000m ³ /d) for Stage-1 is now under construction. It is necessary to expand and/or newly construct another wastewater treatment plant.	Construction of Waste Water Treatment Plant	HHTP-MB (MOST)
High Grade External Infrastructure						
Power Supply	07	220 kV Sub-Station with 2 Circuit Transmission Lines from Hoa Binh and Pha Lai	HaTay	At present, HHTP receives electric power via 110kV transmission lines. Power failure is experienced about once a month. Double circuit power transmission system in 220 kV sourced from Hoa Binh and Pha Lai will increase system liability drastically.	1. 220kV transmission lines (2 routes) 2. Regional substation 220/110kV	EVN
Power Supply	08	Power Plant	Region	It is ideal to have a power plant exclusively use for HHTP, however, difficulties in fuel supply (either oil, gas, and coal) will be a substantial problem.	1.Fuel supply system 2.Construction of power plant 3.Power transmission line and substation	EVN
Telecom	09	International Telecommunication Line	International & National	Vietnam has 2 (two) international telecommunication cables i.e. SMW-3 (Danang) and TVH (Vung Tau). At present, 6 (six) improvement plans for international telecommunication line are proposed by private sector, however, the definit plan has not yet been confirmed.	1. Installation of international telecommunication line 2. Construction of gateway station in Hai Phong 3. Installation of telecommunication cable between Hai phong-Hanoi (Hoa Lac) 4. Construction of Hoa Lac Telecommunication Center	VNPT (MPT)
Research Institute and Technical Training Center						
Building and Facilities	10	Research Institutes	HHTP	There are some state research institutes have expressed their interest to establish in HHTP and start negotiation with HHTP-MB for the land use right. However, detailed plan for the institutes are not defined yet. It is necessary to accelerate their attraction into HHTP by strong leadership of central government, especially on the preparation and approval of the development plan and funding issues.	1.Building work 2.Equipment and facilities	Relevant ministries
Building and Facilities	11	Technical Training Center	HHTP	At present VITEC under HHTP-MB is playing educational role in IT field. However, the detailed activity is not confirmed yet. Therefore, HHTP-MB necessary to fixed the detailed task of VITEC based on the investor's hopes.	1.Building work 2.Equipment and facilities	MOST (HHTP-MB)

Chapter 12 CONCLUSION

The Keys to Success of HHTP Project

The Government of Vietnam declared that Vietnam will become and be recognized in the world as an industrialized country by the year 2020. It is assumed that the main driver of economic development is likely to be the high-tech industrial sector. However, the engine to lead the development of this sector has been the foreign manufacturers who have invested into Vietnam to date and who plan to invest in the future. The absorption of technologies through human resource development and upgrading of technological level by introducing more technologies of international standard is imperative if Vietnam is to achieve this target in this time frame. Vietnam needs to transform the current industrial system, which relies heavily on imported technology, to a more advanced stage in which there is proper application of imported technologies to domestic industries along with the development of independent technologies.

Furthermore, Vietnam also needs to adopt technologies focusing on environmental protection, disaster management, food safety, health care, etc.. In order to achieve these objectives and realize the envisioned development status in the shortest possible time, the Government of Vietnam recognizes the importance of organizing research and development for science and technology, human resources development, and domestic and foreign industries in a systematic way by combining the efforts of state research institutes, academy, and industry. It also recognizes the need to create an environment that supports such a system and its activities in the most effective possible manner.

Under such circumstances and the recognition of such needs, the HHTP has been planned and designed in such a way as to enhance a combination of efforts aiming at industrialization based on collaboration among the organizations, entities and enterprises that make up the HHTP. The HHTP is to be given a unique role by the Government of Vietnam and is designed to function in such a way as to achieve the ultimate effects of the collaboration between the various project stake holders; i.e., state research and development institutions, human resource development institutions, and both foreign and local private industries in the field of high-tech industries.

The six important keys to the success of the Hoa Lac High-Tech Park Development Project are identified as follows:

1. Strong Commitment of the Central Government and Relevant Ministries to Implementation of HHTP as a National Project

Bringing the HHTP to reality will involve a wide variety of government responsibilities, such as science and technology, education, industry, housing, various infrastructure and institutions. It would be impossible for any single existing ministry to manage the entire scope of the Project. It is suggested that the HHTP-MB be positioned directly under the Prime Minister so as to receive the required skills, knowledge and cooperation from the relevant ministries for achievement of the Project.

2. Development of Hi-grade Infrastructure including External Infrastructure necessary for Promotion of S&T and Operation of High-tech Industries

High-grade infrastructure should be provided for HHTP, including roads, transportation, electric power supply, water supply, sewerage and telecommunication. Such arrangements are not just attractive, but essential for the national research institutes, educational organizations and high-tech industries who are considering to establish their facilities in HHTP. As a consequence, implementation of HHTP will not be accelerated unless this infrastructure is provided.

3. Attraction of Excellent Scientists and Engineers

Human resources are the most important and valuable resource for development of HHTP with respect to the advancement of science and technology in Vietnam. It is desired that excellent scientists, researchers, and engineers come to HHTP, not only from other areas of Vietnam but also from abroad, by locating top-level domestic R&D institutes and international level R&D institutes and enterprises. In order to enhance the attractiveness of the area to scientists, researchers, and engineers, it is imperative to provide a comfortable living environment, while incentives such as preferential tax treatment and/or special awards to those who make excellent achievements could also be worth considering.

4. Fostering Young People who will be the Next Leaders in Advancing Science and Technology in Vietnam

HHTP should provide opportunities to ambitious young people to build their capabilities in the field of science and technology. In order to attract young people to HHTP, the Park needs to become a focal point for creation of science and technology in Vietnam. The national research institutes will play an important role in the intellectual and professional nourishment of people. The young people who gain valuable experience in HHTP will have high potential for becoming future leaders of science and technology in Vietnam.

5. Attraction of Anchor Tenants to HHTP with Strategic Marketing

The location of internationally renowned high-tech industries and/or research institutes as anchor tenants in HHTP will have a great effect and impact in attracting other high-tech industries, young scientists and engineers as well as establishing the brand name of HHTP broadly. Intensive promotion activities will be required to induce such anchor tenants in addition to provision of appropriate investment incentives.

6. Popularization of Science and Technology to the Citizens

The popularization of science and technology in Vietnam is one of the important missions to be achieved by HHTP. It is necessary to establish mechanisms to enable the country's citizens, regardless of age, gender and occupation, to know and learn fascinating aspects of science and technology, how exciting and interesting they are,

and how science and technology are so closely linked to our daily lives. The operation of a science museum in HHTP and/or distribution of various types of information on S&T from the HHTP WEB site are good examples of such mechanisms.