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The Applying of Science and Technology into the Production: Thailand's Experience and Lessons For Vietnam

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Abstract: ***Science and technology has an important role for maintaining and improving enterprise's competitive capacity, this has been acknowledged by the nations of the world. Thailand is one of the countries that has achieved many accomplishments in promoting enterprise application of science and technology into production. Based on the research experience of Thailand, this paper proposes the lessons for Vietnam in the planning, implementing and controlling policies to promote enterprise application of science and technology into production; thereby enhancing the product's value added and contributing to implement for social and economic objectives up to 2020.***

Keywords: Applying science and technology, policy, production

1. Introduction

Science and technology are considered the decisive factor for developing economic, social of Thailand; this has been confirmed by the policy makers, presented in (i) The National Science and Technology Strategic Plan 2004-2013, (ii) The National Science Technology and Innovation Policy and Plan 2012-2021 and the action plans on science and technology annually. Thereby, the government stimulates business to increase investment for the research and development (R&D) activities and technological innovation in manufacturing in order to create products that are highly competitive, promotes the transfer of research results and commercializes technology patents simultaneously from public research institutions such as universities/ institutions to private manufacturing area.

Because of policies to promote business investment to inovate the production technologies so have brought about great achievements. For example, when the car industry has developed, the major automobile Manufacturers have put the factory in Thailand, such as Ford, BMW, Mitsubishi, Toyota, Honda, Mazda, General Motots, Nissan and Isuzu; and then the supporting industry for electrical, electronic and mechanical engineering have developed. Thailand is the world's second largest maker of hard disk drives (makes about 40% of world supply), Consequently, the share of industry in in the economy increases, which accounts for 50% of GDP in 2011, compared with 44,9% in 2006[1].

Nowaday, Thailand has become the nation that has high relatively scientific and technology background in ASEAN member states. There are many achievements in promoting business of investments in science, technology and innovation. To obtain these achievements, Thailand has ways of planning, execution of policy efficiency in promoting national resources, external funds have been mobilized, especially policies to promote enterprises research and development, technological innovation. These are positive factors that Vietnam should learn and apply how to use a flexible manner in promoting business of applying science and technology into production.

2. Research Methodology

To obtain the lessons learned from Thailand, secondary data is conducted to search, collected, classified, evaluated and used through research projects in Vietnam and abroad; searched and used information in the strategies, plans, policies and programs of Thailand, which were translated into English and Vietnamese, in both hard and soft copies, and used the data was posted in the internet.

Also, the primary data was gotten through seminars with: (i) National Science Technology and Innovation Policy Office (STI), Ministry of Science and Technology of Thailand (23rd January 2015), (ii) National Research Council directly under the prime minister of Thailand (26th January 2015). Based on the discussion of scientists and experts, appropriate data was evaluated, selected and used to to serve research objectives.

3. Research Results

In 1997, Thailand showed determination that shifted from labor-intensive mechanical processes to technology-intensive processes, towards sustainable development based on national endogenous capacity. This was reflected in the develop plans of scientific development and national technology (1997-2006), The National Science and Technology Strategic Plan (2004-2013) and then The National Science Technology and Innovation Policy and Plan 2012-2021. Part of the strategies, plans and policies have emphasized promoting businesses applied science and

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technology to manufacturing, through: (i) increasing investment and deployment of research in both the public and private sector, (ii) promoting linkages between research institutions/universities with industrial production sector, (iii) developed centers of excellence and formed the strongest team, (iv) support commercialization the results of scientific research and technology deployment in enterprise

Firstly, investment in research and development (R & D)
Thailand spent only 0,13% of GDP on R & D in 1998, 0,25% of its GDP by 2006, increased 0,37% of its GDP by 2011, tentative figures 1% of its GDP by 2016 and 2% of its GDP by 2021. Besides that the government gradually increased the proportion of people engaged in research and deployment of over 10,000 people, this ratio was 9.01 / 10,000 in 2011, is expected is 15/10,000 people in 2016, and up to 25 people /10,000 people in 2021. Also private sector has been promoted production to increase expenditure on R & D activities, but the rate of public investment in R&D /privatization tends to decrease, R&D expenditure in 2011 (the private sector accounted for 51% and the government accounted for 49%), in the period 2016 – 2020, this percentage will be expected respectively that the private sector will account for 70% and will be 30%. The government has enhanced the autonomy of scientific and technology activities (Figure 1).

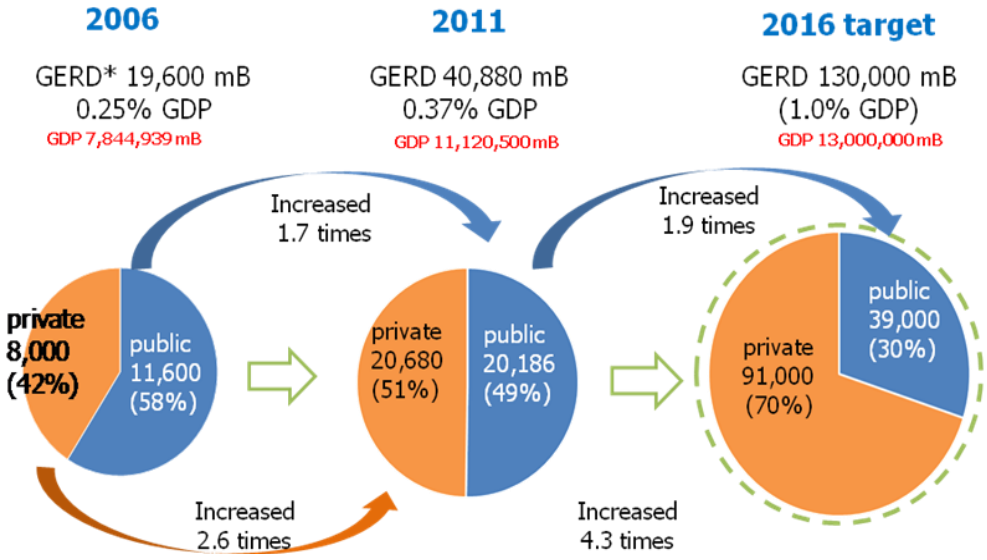

Figure 1: Investment ratio for R & D in the public and private sector in Thailand

Source: National Science Technology and Innovation Policy Office (2014, for private R&D) and National Research Council of Thailand (2014, for public R&D)

Policies to increase investment in R&D of Thailand have contributed significantly in promoting innovation activities in enterprises. Firstly, the Government focused on the nndustry development potential, such as food industry, automotive industry, software industry and IC, textile industry, tourism, medical and biotechnology; then the Government constructed and developed the groups linked to support, encouraged and increased cooperation in R&D activities to improve technological innovation for businesses in groups. The rate of enterprises performed innovation activity increased to 35% in 2013, the index of the innovation capacity and contribution rate of knowledge into GDP were enhanced.

Secondly, promoting linkages between research institutions/universities with industrial production sector

The Government has created a favorable policy environment through reforming management systems and planning process for science and technology to be able to implement successful innovation: established and supported capacity building of key laboratories in the universities / institutes / the organizations of science and technology, where can create new knowledge through R&D activities; developed science parks, technical services for links between academic research areas and industrial production zones to support and created favorable conditions for businesses can perform technological innovation activities. Thailand has encouraged the development of science and technology for the private sector, such as exemption and reduction of import tax for equipments in service of research, training; tax credits and incentives, allowing accelerated depreciation in the first year for equipment R & D service (up to 40%); developing action plans for enhance national competitiveness through performance improvement R&D capabilities to reform the human technological resources in enterprices to facilitate development of technology in the private sector [OECD Review of Innovation in Southeast Asia (2011), Country Profile of Innovation in Thailand].

To strengthen the link between research sectors and manufacturing sectors, the Government of Thailand has enhanced realist of training activities by improving technological skills through large projects (For example: solar project to initialize the potential to generate electricity for consumption in domestic with an affordable price, the project have trained at least 25 technologists per year). Moreover, Thailand also encourages and reduces tuition for entrepreneurs, engineers working in the business to raise capacity themselves when they apply in the advanced

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program at the institutes/universities; simultaneously, supporting and supplying the information to promote R&D activities of enterprises to create new technology and new process.

Thirdly, develop the research centers of excellence and form research groups of excellence.
Thailand encourages the developed key laboratories in universities / research institutes to become research centers of excellence. These centers will form the research groups of excellence, in which could create new knowledge, patents, and publications that are published in international journals; simultaneously, research centers of excellence can create the link between industrial parks and public sectors, thereby bring the benefit to society.

To be able to form the research centers of excellence, the Government has supported activities to build technological capacity in key laboratories. The coordinating agencies to build include: National Council Science and Technology Policy, Higher Education Commission, Ministry of Science and Technology. Moreover, Thailand encouraged to develop of science parks, technical services such as testing centers and quality assessment, centers of measurement, thereby to better serve for application of science and technology into production of enterprises.

Fourth, support the commercialization of the results of scientific research and technological development in the enterprise.
Thailand has incentive policies of finance to encourage enterprise's R&D activites and commercialization of technological patents through the Innovation Development Fund, Revolving Fund of Research and Technology Development. In which, Innovation Development Fund will support R&D activities in the manufacturing sector, in the form of 50-50, which means that businesses must spend at least 50% of the total budget, 50% will be supported with low interest rates (1/3 offered by commercial banks, the remaining 2/3 of the Fund). Revolving Fund of Research and Technology Development of the Ministry of Science and Technology will support commercialization of results of R&D, support the upgrading and improvement of machinery and equipment to improve product quality, these activities will support with low-interest loans (about 5%/year) and time of loan from 5 to 10 years.

In addition, to promote the application of science and technology in production, the Government focuses on developing human resource of science and technology to enhancing technological capacity, promote the linking clusters, and developing technology infrastructure to encourage innovation; Simultaneously, enhancing public awareness of science and technology to thereby contributing promote the reform of the management system for science and technology Effectively. Moreover, the international cooperation activities in the field of science and technology and attract foreign investment in high-technology sectors also focused development.

4. Conclusion and Recommendations

Thailand has reached the achievements in the decentralization of management and the implementation of policies clearly, based on cooperation between state management agency, enterprise community and experts. In particular, the Government has promoted development in the private sector, through specific activities, such as developing high-quality resources, promote technological innovation, technological capacity building for small and medium enterprises, through education policíe, financial incentives and public investments.

Vietnam should complete the current policies, or issued new policies to promote enterprises applying scientific and technology in production, based on the learning experience of Thailand selectively. To achieve this:

Firstly, Government should review the policies relating to promote of enterprise apllying scientific and technology in production, based on that assessment and improvement of policies (strategy/ planning/plans/programs/projects that related). Especially of policies related to taxation, credit, training and directly support, land in order to create favorable condition to enterprises carry out R&D, thereby helping enterprises to receive technology , towards improvement, copy and create new technologies, new processes.

Secondly, the State should encourage enterprises and private organizations to increase investment for science and technology, raising of the total investment of Vietnam's science and technology to equivalent with average of the nations in the world, about 1.9% of GDP (currently 0.85% of GDP, of which the State budget of about 0, 5% of GDP, the private sector is about 0.35% of GDP). At the same time, the Government should encourage the establishment of enterprise in R&D organizations, universities; thereby enhancing the qualification of human, linking science, education with production, sales and service.

Thirdly, the State should stimulate the establishment of R&D department in enterprises so that businesses have access to the scientific and technological advance in the world, which formed the idea of research to create new products/new procedures to serve themselves, through which enterprises will enhance the technological innovation capability. In addition, the Government should support the activity technology foresight of enterprises. This activity is not only significant for enterprises but also significant for the state management agencies to determine the priority technologies to support the process of strategic plan/technology development plan.

Fourthly, should establish the centers of excellence and the strong organizations for R&D technology to connect the public research sector and the private sector. Moreover, the state should create quality human resources, particularly human resources and technology; to do this the State needs strong reform training systems, associated training activities,

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scientific research in universities/research in institutes with reality, to satisfy the increasing demand for human resources in order to serve for technological innovation of enterprises

Fifthly, continue to review and complete the incentives (taxation, credit, training, land and direct supporting) to promote enterprises perform R&D and technological innovation, to create favorable conditions for business investment of production expansion and modernization of technological lines, step by step to raise competitiveness of products on the market; and raise the level of funding for research projects and pilot production through National Foundation for Science and Technology Development (NAFOSTED), Development Assistance Fund, National technology Innovation Fund (NATIF), etc.

References

[1] Chatri Sripaipan and Yada Mukdapitak (2007), *Thailand's STI Policy and System towards Knowledge-based Society*, Presented at the 5th Ministerial Meeting on Cooperation in Science and Technology between Thailand and Vietnam.
[2] Binh Le Thanh (2010), *Industrialization export orientation of Thailand, experience and the ability to apply to Vietnam*, PhD thesis, University of National Economics.
[3] Lai Minh Phung and et al (2008), *Sustainable development and the competitiveness of Thailand relying on science and technology*, NASATI, Hanoi.
[4] National Agency for Science and Technology Information (NASATI, 2006), *Some characteristics of the development of science and technology of Thailand*, Report 6/2006, Hanoi.
[5] National Research Council of Thailand (2014), *Thailand's science, technology policy,* Bangkok, Thailand.
[6] National Science Technology and Innovation Policy Office (2014), *Overview of Thailand's Science, Technology and Innovation Policy*, Ministry of Science and Technology, Thailand.
[7] OECD (2011), *Review of Innovation in Southeast Asia*, Country Profile of Innovation in Thailan.
[8] Pichet Durongkaveroj (2014), *Thailand's science, technology and innovation policy*, National Science Technology and Innovation Policy Office, Thailand.
[9] (http://unctad.org/meetings/en/Presentation/MYEM2_2014_Durongkaveroj_Pichet.pdf)
[10] Xuyen Nguyen Huu, Binh Nguyen Dinh (2014), Development experience of technology in supporting industry of Thailand and lessons for Vietnam, Joural Science and Technology Policy and management, Vol 3, No.1, 2014, Hanoi.
[11] Yada Mukdapitak and et al (2012), *Overview of Thailand STI policy and plan*, Thailand-Lao PDR STI Cooperation Workshop, page 16-23, Vientiane, Lao.
[12] (http://www.sti.or.th/thai-laoPDR-STIWorkshop/form/Workshop_Accompanying_Document.pdf)
[13] http://www.dna.com.vn/vi/tin-tuc-thuong-hieu/tin-quoc-te/phat-trien-cong-nghiep:-nguoc-mat-nhin-thai-lan/.

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