

## DEVELOPMENT POLICIES ON FUNDAMENTAL INDUSTRIES IN THE PERIOD OF CONTINUING TO INTENSIFY THE INDUSTRIALIZATION AND MODERNIZATION IN VIETNAM

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### **Summary:**

*This article<sup>2</sup> focuses on elucidating the Party's leaderships and directions in the development of fundamental industries through various periods from the VI Congress (1986) to the XIII Congress (2021) of the Communist Party of Vietnam. Simultaneously, it points out the Party's orientations and choices in developing fundamental industries within Vietnam's socio-economic development strategy. The study also highlights the State policies aimed at promoting the development of fundamental industries and elucidating the situation of these industries during the period of 2011-2020. Consequently, it proposes policy solutions for fundamental industries development in the continuing period to intensify the country's industrialization and modernization until 2030, with a vision towards 2045.*

**Keywords:** Fundamental industry; Industrialization and modernization; Policy.

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### **1. Leadership and direction of the Party in the development of fundamental industries**

Fundamental industries are considered sectors that produce core materials for other industrial sectors. According to Mathew Lawrence, these are “industries that produce essential core materials for processing, manufacturing, and construction industries” (*Mathew Lawrence, 2016*).

Relying the importance of Fundamental industries, the Party's documents, particularly the XII Party's Congress, outlined the directive to “develop Fundamental industries to meet the basic production material needs of the economy” (*XII Congress Documents, 2016*). This includes industrial fields such as energy, metallurgy, petrochemicals, chemicals, mechanical manufacturing, and materials. At the XIII Congress, the Party continuously emphasized the development of specific Fundamental industries to meet the basic production material needs of the economy. The document explicitly mentioned “energy, mechanical engineering, metallurgy, chemicals,

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fertilizers, materials...” as Fundamental industries (*XIII Congress Documents, 2021*). Through the analyzing the documents from the VI Congress to the XIII Congress and Resolution No. 29-NQ/TW of the Central Executive Committee of the XIII term, the Party identified six Fundamental industries: (1) Metallurgy (focusing on developing alloy steel, specialty steel for new-generation machinery, especially for defense and security); (2) Mechanical engineering (focusing on machinery for agriculture, automobiles, ships, construction equipment, energy equipment, and medical equipment); (3) Chemicals (focusing on basic chemicals, petrochemicals, pharmaceuticals, and fertilizers); (4) Energy (focusing on renewable and new energy); (5) Materials (focusing on developing new materials); (6) Digitals (focusing on artificial intelligence, big data, blockchain, cloud computing, the Internet of Things, electronic communication devices, and semiconductor chip design and production). Additionally, during the XII term, the Political Bureau issued Resolution No. 23-NQ/TW on March 22<sup>nd</sup>, 2018, regarding the orientation the national industrial development policy until 2030, with a vision towards 2045. Resolution No. 52-NQ/TW on September 27<sup>th</sup>, 2019, outlined proactive approaches to participating in the Fourth Industrial Revolution. Furthermore, Resolution No. 29-NQ/TW on November 17<sup>th</sup>, 2022 reiterated the commitment to continuously implement the industrialization and modernization of the country until 2030, with a vision towards 2045. These 3 resolutions emphasized the dominant role of developing information technology and electronic industries, the central role of processing and manufacturing industries, and a breakthrough role of promoting smart technology for Vietnam. The development of six Fundamental industries was underscored as a crucial and core aspect of industrialization and modernization process in Vietnam.

## **2. Party's orientation, State policies, and legal framework for the development of Vietnam's fundamental industries over time**

### ***2.1. The Party's congresses identification of fundamental industries***

Based on studying the Party's Documents, at the VI Congress, the Party identified crucial industries for the entire economy, including energy, materials, and metallurgy. The VII and VIII Congresses continued to focus on developing the same industrial fields as mentioned above. At the IX Congress, the Party specified further, stating, “Build selectively some heavy industrials fields: petroleum, metallurgy, mechanical engineering, basic chemicals, fertilizers, construction materials...” (*IX Congress Documents, 2001*). These were considered core industries serving the country's

development. The X Congress directed: “The state focuses on investing or supporting investment to develop some important products of the economy, such as oil refining, ore exploitation and steel refining, fertilizers, chemicals, cement, bauxite exploitation and aluminum production, paper powder attached to afforestation, some mechanical engineering products” (*X Congress Documents, 2006*). It explicitly emphasized the national key industries: (1) Energy (oil refining); (2) Metallurgy (ore exploitation and steel refining); (3) Chemicals (fertilizers, chemicals); (4) Materials (cement, bauxite exploitation and aluminum production, paper powder); (5) Mechanical engineering. The XI Congress specified: “Develop selectively processing, manufacturing, high-tech industries, energy industry, mining, metallurgy, chemicals, defense industry” (*XI Congress Documents, 2011*). Subsequently, the XII Congress identified that “Developing some Fundamental industries to meet the basic material needs of the economy” (*XII Congress Documents, 2016*), listing industries forming the foundation for industrialization and modernization including: (1) Mechanical engineering; (2) Metallurgy; (3) Chemicals; (4) Construction materials; (5) Energy. Recently, in XIII Congress, the Party directed to “Concentrate on developing some Fundamental industries to meet the basic production material needs of the economy, such as energy, mechanical engineering, metallurgy, chemicals, fertilizers, materials...” (*XIII Congress Documents, 2021*), listing Fundamental industries as: (1) Mechanical engineering; (2) Metallurgy; (3) Chemicals, fertilizers; (4) Materials; (5) Energy.

Therefore, throughout the Party's Congresses from 1986 to the present, five Fundamental industries have been identified, including: (1) Mechanical engineering; (2) Metallurgy; (3) Chemicals; (4) Materials; (5) Energy. Recently, in Resolution No. 29-NQ/TW on November 17<sup>th</sup>, 2022, the Central Executive Committee of the XIII term regarding the continuing industrialization and modernization of the country until 2030, with a vision towards 2045, the Party officially added the new digital technology industry as a Fundamental industry of Vietnam.

## ***2.2. Policies on the development of fundamental industries during the 2010-2021 period***

*1- Mechanical engineering industry:* Recognizing mechanical engineering as a focal industry, the Prime Minister issued Decision No. 186/2002/QĐ-TTg on December 26<sup>th</sup>, 2002, approving the Development Strategy of Vietnam's Mechanical Engineering Industry by 2010, with a vision to 2020. On October 17<sup>th</sup>, 2003, the Politburo also issued Conclusion No. 25/KL-TW on the Development Strategy of Vietnam's Mechanical Engineering Industry, aligning with the content of the Government's strategy in Decision

No. 186/2002/QD-Tags. Policies for the mechanical engineering industry included: market policies, capital creation policies, tax policies, investment policies for research and development, and workforce training policies. In addition, the State has also issued specific documents on state management for several strategic mechanical sub-sectors<sup>3</sup>.

2- *Metallurgical industry*: In the period 2001-2020, the Prime Minister approved the steel industry development plan<sup>4</sup> with the goal of establishing and developing Vietnam's steel industry into a crucial industry, ensuring stable and sustainable development. This involved minimizing imbalances between cast iron, and steel billets and finished steel products production, between long and flat steel products. The development strategy for Vietnam's industry until 2025, with a vision to 2035, was specified in Decision No. 879/QD-TTg on June 9<sup>th</sup>, 2014. This included investment in developing steel production for the mechanical engineering industry, such as steel plates, structural steel, and alloy steel.

3- *Chemical industry*: During the period 2001-2020, the Prime Minister approved the development plan of Vietnam's chemical industry until 2020, considering the period up to 2030 in Decision No. 1621/QD-TTg on September 18<sup>th</sup>, 2013; Planning to develop the production and distribution system of fertilizers for the period 2011-2020, with a view to 2025; Planning for development of Vietnam's paint and printing ink industry to 2020, vision to 2030; Planning for development of Vietnamese rubber product production until 2025, vision to 2035; Planning for production development of basic chemical products in Vietnam until 2025, vision to 2035; Restructuring Vietnam's chemical industry to serve the cause of industrialization, modernization and sustainable development in the period to 2020, vision to 2030.

The above-mentioned policy systems show that the State pays special attention to the development of the chemical industry, considering it a basic, important, and essential material production industry, providing input materials for other industries.

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<sup>3</sup> Decision No. 115/2004/QD-BCT dated October 27<sup>th</sup>, 2004 of the Minister of Industry promulgating regulations on Standards for automobile manufacturing and assembling enterprises; Decision No. 24/2002/QD-BCN dated June 17<sup>th</sup>, 2002 of the Minister of Industry promulgating Regulations on standards of enterprises manufacturing and assembling two-wheeled motorbikes; Policy to support buyers of agricultural machinery and equipment in Decision No. 63/2010/QD-TTg dated October 15<sup>th</sup>, 2010; Decision No. 65/2011/QD-TTg dated December 2<sup>nd</sup>, 2011 on amending and supplementing a number of articles of Decision No. 63/2010/QD-TTg and Decision No. 68/2013/QD-TTg dated December 14<sup>th</sup> November 2013 on support policies to reduce losses in agriculture, replacing Decisions No. 63/2010/QD-TTg and No. 65/2011/QD-TTg.

<sup>4</sup> (i) Master plan for steel industry development in Decision No. 134/2001/QD-TTg of the Prime Minister approving the Master plan for steel industry development until 2010; (ii) Vietnam steel industry development planning for the period 2007-2015, with a view to 2025 in Decision No. 145/2007/QD-TTg dated September 4<sup>th</sup>, 2007.

4- *Materials industry.* Preferential policies to encourage and attract investment to develop materials industry sectors are clearly shown in two periods: the period 2005-2015 and the period from 2015 to present. Several sub-sectors of new material production became the special investment favorable areas, including: (i) Production of composite materials, light construction materials, and rare materials; (ii) Production of high-grade steel, alloys, special metals, sponge iron, steel billet; (iii) Production of semiconductors and high-tech electronic components. Other investment favorable areas include science and technology, electronics, mechanics, materials production, and information technology related to the materials industry as follows: (i) Investment in research and development (R&D); (ii) Production of steel billets from iron ore, high-grade steel and alloys; (iii) Production of coke and activated carbon; Production of energy saving products; (iii) Production of petrochemicals, pharmaceutical chemicals, and basic chemicals; (iv) Plastic - technical rubber; (v) Production of materials to replace asbestos materials.

5- *Energy industry.* During the period 2001-2020, the Prime Minister issued several decisions approving strategies and plans for development of the oil and gas industry, including the development of petrochemical refining<sup>5</sup>. In particular, the Government has special investment incentive policy mechanisms to encourage investment, including specific incentives including: (i) import tax exemption and reduction; VAT on imported machinery, supplied materials and equipment; exemption, reduction of land rent; (ii) corporate income tax incentives, input gas price incentives; (iii) regulatory tax collection policy for petrochemical products...

6- *Information technology industry.* The Party and State have many policies and directions for developing the electronics and telecommunications industry. Resolution No. 23-NQ/TW dated March 22nd, 2018 of the Politburo (Term XII) on orientations for building national industrial development policies to 2030, vision to 2045, the Party also determined the prioritized focus on the development of a number of industries such as: Information technology and telecommunications, electronics industry at the world's advanced level, meeting the requirements of the fourth industrial revolution in order to create digital technology platform for other industries. Resolution No. 50/NQ-CP dated April 17<sup>th</sup>, 2020 of the Government

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<sup>5</sup> (i) Decision No. 386/QD-TTg dated March 9<sup>th</sup>, 2006 of the Prime Minister approving the strategy for developing Vietnam's oil and gas industry until 2015, with a vision to 2025; (ii) Decision No. 223/QD-TTg dated February 18<sup>th</sup>, 2009 of the Prime Minister approving the development plan for Vietnam's oil and gas industry until 2015, with a vision to 2025; (iii) Decision No. 1748/QD-TTg dated October 14<sup>th</sup>, 2015 of the Prime Minister approving the strategy for developing Vietnam's oil and gas industry until 2025, with a vision to 2035; (iv) Decision No. 1623/QD-TTg dated October 25<sup>th</sup>, 2017 of the Prime Minister approving the development plan for Vietnam's oil and gas industry until 2025, with a vision to 2035.

promulgating the Government's Action Program to implement Resolution No. 52-NQ/TW dated September 27<sup>th</sup>, 2019 of the Politburo on a number of orientations and policies to proactively participate in the Fourth Industrial Revolution, specifically: projects to support businesses in researching and applying digital technology to serve digital transformation and digital economy; building capacity for research, technology development, equipment manufacturing, and development of domestic applications to serve the digital transformation and digital economy process; Building facilities and technical infrastructure to serve the testing of products and solutions in the field of information and communications technology.

### ***2.3. Results of implementing development policies of fundamental industries over the past time***

*1- Mechanical engineering sector:* Currently, Vietnam's mechanical engineering sector focuses on three sub-sectors: motorcycles and motorcycle parts, household and industrial machinery, and automobiles and auto parts. These three sub-sectors account for nearly 70% of the total industrial production value of the country's mechanical industry. There are approximately 29,713 active mechanical engineering businesses, accounting for 30.7% of the total processing and manufacturing industry enterprises. The net revenue from production and business activities is VND 1,686,629 billion, providing employment for about 1,175,978 workers, representing nearly 16.1% of the total labor force in the processing and manufacturing industry. As of the end of 2021, there are more than 40 automobile production and assembly enterprises in the country, with domestic production meeting about 70% of the demand for vehicles under 9 seats. Some domestic enterprises have actively participated in the global automobile production chain, exporting products to markets such as Thailand and the Philippines. The total assembly capacity is approximately over 680,000 vehicles per year. Types of light trucks under 7 tons, passenger cars with 25 seats or more, and specialized vehicles produced domestically have achieved a high localization rate, basically meeting the needs of the domestic market (*Vietnam Mechanical Association, 2022*). The localization rate of various types of motorbikes is about 85-95%. In particular, the petroleum mechanical engineering sector has successfully manufactured and put into operation a self-elevating drilling rig with a water depth of up to 90 meters, replacing the import of this product from abroad. This is the first time a high-tech mechanical engineering product has been organized for production in Vietnam, with a localization rate of 35%.

*2- Metallurgical industry:* In the 10-year period from 2010 to 2020, the metallurgical industry in Vietnam experienced significant development and

growth, becoming a crucial industry in the economy. Specifically, in the production of iron and steel, the number of enterprises in 2019 was 1,458, a 1.7-fold increase compared to 2010, attracting over 100,000 workers, a 1.45-fold increase from 2010. The average growth rate in the 2010-2019 period was 20% per year for crude steel and 13% per year for finished steel. With a crude steel production of 17.46 million tons in 2019, Vietnam ranked 15th among the world's largest crude steel-producing countries and led Southeast Asia in both production and consumption of steel. The production capacity of various types of steel increased rapidly, with 12.67 million tons of steel products in 2019 (1.8 million tons in 2010 and 2.8 million tons in 2015); 22.14 million tons of crude steel in 2019 (5.7 million tons in 2010 and 12.61 million tons in 2015). Construction steel in 2019 reached 16.69 million tons (7.83 million tons in 2010 and 12.78 million tons in 2015). Currently, conventional construction steel billets have fully met domestic and export demand (*Vietnam Steel Association, 2022*).

*3- Chemical industry:* In the period from 2011 to 2020, many new chemical plants were built and put into operation, relatively meeting the demand for new basic chemicals and quality consumer products such as fertilizers (urea, NPK), rubber tire and tubes, batteries- accumulators, detergents, pesticides, inorganic chemicals (such as sulfuric acid, phosphoric acid, soda, NH<sub>3</sub>), and petroleum products. Vietnam invested in new and expanded urea production plants, such as the Ca Mau Fertilizer Plant with a capacity of 800,000 tons/year, the Ninh Binh Urea Plant with a capacity of 560,000 tons/year, and expanded the capacity of the Ha Bac Urea Plant from 180,000 tons/year to 500,000 tons/year. The total urea production capacity is currently about 2.66 million tons/year, meeting 100% of domestic demand and partially for exporting. Regarding DAP fertilizer, before 2009, Vietnam did not have DAP fertilizer plants. Then, in the period from 2010 to 2020, Vietnam invested in 2 plants: DAP Plant No. 1 with a capacity of 330,000 tons/year in Hai Phong and DAP Plant No. 2 with a capacity of 330,000 tons/year in Lao Cai. The total national capacity is currently 660,000 tons/year, meeting nearly 70% of domestic demand (*Vietnam Chemical Group, 2022*).

*4- Materials industry: Fiber, yarn, textile materials.* In the period 2011-2020, our country's fiber and textile and garment production industry grew quite considerably and stably. The average annual growth rate of fiber production was 14.92%, increasing from 810 thousand tons in 2010 to 3.26 million tons in 2020. Fabric production increased at an average rate of 7.34% per year, reaching nearly 2.4 billion square meters, more than double the 1.1 billion square meters in 2010. Clothing production increased from 2.6 billion pieces in 2010 to 5.2 billion pieces in 2020, with a growth rate of 7.2% per year (*VITAS, 2022*).

- *Tanned leather, synthetic leather.* In the period from 2010 to 2020, the production of leather and synthetic leather in Vietnam developed positively, with over 350 enterprises meeting about 45-50% of the demand. Among them, 40 leather processing plants meet about 30% of the production demand. Large-scale foreign-invested leather plants, meeting environmental standards have developed strongly. However, Vietnam still has to import a large volume of finished leather and wet blue leather, with a value of over USD 1.6 billion per year (*Lefaso, 2022*). Raw materials account for 68-75% of the production cost of footwear products, but the domestication rate of these products by Vietnamese enterprises is currently 40-45%.

- *Rubber and rubber products.* In the period from 2011 to 2020, natural rubber production increased at an average rate of 5.2% per year (*Vietnam Rubber Association, 2022*). The export value of rubber products is equivalent to the export value of natural rubber (accounting for 80-82% of output). Rubber export volume reached 1.7 million tons, equivalent to USD 2.3 billion in 2019, an 8.8% increase in volume and a 10% increase in value compared to 2018. The current production capacity ranks third, with a yield of about 1.67 tons/ha, ranking first in productivity with over 941,200 ha, fifth in rubber area in the world. Specifically, 710,600 ha were exploited, yielding over 1.18 million tons. The entire industry has nearly 500 businesses and establishments producing finished products from rubber, including 10 state-owned enterprises, 321 private enterprises, and 125 foreign-invested enterprises.

- *Plastics industry.* In the period from 2010 to 2020, the plastics industry experienced high growth with an annual growth rate of 16%-18%, and some products had a growth rate of nearly 100% per year. With rapid development, the plastics industry is considered a dynamic sector in the Vietnamese economy. The growth is attributed to a broad market, significant potential, and, particularly, the fact that the Vietnamese plastic industry is still in the early stages of development compared to the world, and plastic products are used in all aspects of life, including plastic packaging products, plastic construction materials, household plastic products, and high-tech plastics.

- *Paper.* In the period from 2010 to 2020, the paper industry grew at an average rate of about 7% per year, with the wood and wood product sub-sectors experiencing relatively high growth, ranking sixth in export turnover among the key export commodity groups of Vietnam. Products such as packaging paper, printing paper, writing paper, tissue paper, and other types of paper experienced high growth, with packaging paper growing by 12.5%. Importation of printing and writing paper decreased, especially a 15.67%



decrease in 2019 compared to 2018. Tissue paper consumption increased by 10.4%, with exports reaching 67 thousand tons, a 19.6% increase. Other types of paper for consumption, with 47 thousand tons, decreased by 6%, and exports reached 125 thousand tons, a 19% increase (*Vietnam Pulp and Paper Association, 2021*).

*5- Energy industry:* In the period from 2010 to 2020, the oil refining sector made a significant contribution to the country's economy. In 2020, the total production volume of petroleum refining products was about 15.5 million tons, with a total production value of about VND 189 trillion. Specifically, industrial petroleum refining products include: (i) Annual production of urea fertilizer is about 1.6 million tons/year, supplying about 80% of the country's urea fertilizer demand; (ii) Annual production of refined petroleum is about 13 million tons, supplying about 70%-80% of the country's refined petroleum demand; (iii) Production of petroleum and petrochemical products (PP, Benzene, Paraxylene, Sulfur) from 2 oil refineries is about 1.8 million tons/year (*PVN, 2021*). The scale of the gas industry currently includes 5 gas systems with over 1,200 km of gas pipelines, 3 gas processing plants, and 13 LPG storage warehouses with a capacity of nearly 100 thousand tons, and a nationwide gas and gas product distribution system,... Gas industrial systems are operated safely and effectively and maintained to provide 100% operate safely, effectively, and stably maintained a 100% market share of dry gas for the development of the industry, including the power-gas plants of PVN, and EVN, and BOT investors; the ammonia fertilizer production plants; the low-pressure gas consumption households; the CNG. Import and effectively distribute LPG to wholesalers, industrial households, and residential consumer households throughout the country. Every year, PVN currently supplies raw materials and fuel inputs to produce 30-15% of the country's electricity production, produces 1.6 million tons/year, meeting 70% of the country's nitrogen demand, and holds over 60% of the national LPG market share. In addition, with an average annual revenue growth rate of 7%; State budget contributions increased by 6% per year, contributing 10% to the total state budget revenue; and accounting for 10-13% of the national GDP in the period from 2016 to present.

*6- Digital technology industry:* Vietnam's information technology, telecommunications, and electronic industry have developed rapidly since 2010, especially impressive is the export of electronic products, computers, components, and various types of phones. In 2020, the revenue of the electronic and telecommunications industry reached USD 123.5 billion (a 9.71% increase compared to 2019, a 16.2 times increase over 10 years). The breakdown is as follows: Hardware and electronics: USD 110 billion (a

9.63% increase compared to 2019); Software: USD 5.4 billion (a 9.49% increase compared to 2019); Digital content: USD 934 million (a 9.75% increase compared to 2019); ICT services: USD 7 billion (an 8.61% increase compared to 2019); Labor force: 1,030,000 people (a 2.47% increase compared to 2019); Contribution to the state budget: VND 60,000 billion; Concentrated ICT zone: 7 zones (an increase of 2 zones compared to 2019); Outsourcing services: Top 6/60 after India, China, Malaysia, Indonesia, and Brazil (in 2019, Top 5/50); Export of phones and phone components: Top 2 in the world after China in 2020; Export of electronic circuit components: Top 10/15 countries in the world; Export of electronic games: Top 9/15 largest countries in the world in 2019; Number of digital technology enterprises: 58,377; Number of digital technology enterprises per 1,000 people: 0.59 (*Ministry of Information and Communications, 2022*).

#### **2.4. Some weakness and limitations**

1- *Lack of focus, emphasis in the development of Fundamental industries, failure in identifying strategically important industries.* The orientations for industrialization and modernization in each period are not focused and key, and resulting in too many spearheads, lacking in synchronized solutions, especially in the coordination relationship of institutional improvement, and policies building along with solutions, resources balancing. Industrial development policies of many provinces are still formal, not consistent with comparative advantages, lacking coordination and leading to unfair competition, badly affecting the industrial planning of the region and the country. There is a lack of breakthrough policies to establish Fundamental industries.

2- *Productivity and quality of raw materials created by fundamental industries still have many limitations in scale, and high-quality material products are not yet available.* Products of fundamental industries have limitations in scale, and high-quality material products are not yet available. Locally manufactured materials like iron and steel account for only 20-25%; aluminum, copper account for around 5%; 80% of input plastics materials are imported; 100% imported synthetic rubber; 98% imported electronic materials and equipment...

3- *The basic factors for fundamental industrial development have been raised higher, but the potential is still weak.* (i) Materials science and technology activities have achieved certain achievements, but there is no foundational technology to meet the requirements of large-scale production, research applications are not complete and inadequate, and there is a lack of technology accumulation; (ii) Enterprises in foundation industries have been

formed, but the number of them is still small, there are no strong enterprises, and industrial corporations of regional scale have not been formed; (iii) Training and development of human resources for fundamental technology are maintained, but scattered and dispersed, with low input quality, and lack of creative talent in the field of new materials; (iv) Exploitation and use of minerals are promoted, but the efficiency is still low, with many losses, benefits are not high, such as coal loss in open pit mining is about 5%, underground mining is 24%; Manganese ore loss in open pit mining is about 20%, underground mining is 40%; Open cast mining of chrome ore has a loss of about 15%; Investment efficiency in mineral exploitation and processing projects is low. Some other minerals such as titanium, zircon, manganese, molybdenum, chromite, antimony... have not focused on applying that technology aiming to create products with high added value.

*4- The investment and financial environment have improved but still has many disadvantages, is not fair, and lacks transparency.* Policies have not effectively addressed the issue of access to resources such as finance, land, policy information, etc. for enterprises. Credit for the development of Fundamental industries, especially high-tech industries, is not commensurate with the development requirements of the sector.

*5- Environmental pollution, slow improvement in production safety.* The level of pollution is still high, posing with many potential risks of serious pollution. Some environmental issues arising from material production include: Air and dust pollution, specific factors causing pollution in the material industry, especially in the production of building materials, mineral exploitation, steel production, and chemical production. Environmental pollution of land and the decline of biodiversity, climate change from exploration, mineral extraction, raw materials, and many places, after mineral extraction, have not been able to fully restore, environmental impacts on agriculture and forestry are adversely affected by changes in topography, landscape disruption, affecting soil quality, ecosystems, and biodiversity.

*6- Collection and recycling activities have been improved, but are still basically rudimentary and have not yet formed the main elements of a circular economy.* According to estimates by the General Department of Environment, normal industrial waste generated from industrial production activities is about 25 million tons/year, while hazardous waste generated from industrial production activities is about 1 million tons. The amount of waste in urban areas sent to centralized landfills is only about 60-65%, the remaining amount of garbage is dumped and discharged into lakes, rivers, roadsides; and in rural areas, the garbage is collected very limit.

### **3. Proposed tasks and key solutions for the development of fundamental industries by 2030, vision to 2045**

To continue promoting the achievements made in the Fundamental industries development to meet the country's development requirements for the period up to 2030, with a vision to 2045, Vietnam needs to further intensify the implementation of the following tasks and solutions:

1- *Innovating awareness, enhance proactiveness, and creativity.* It is needed to have specific roadmaps and steps, with a focus on developing fundamental industries. Prioritize resources and have breakthrough mechanisms, policies, specifically to develop Fundamental industries linked to smart technologies to create products with high added value. Enhance industrial linkages and regional linkages to create new development spaces for Fundamental industries.

2- *Improving institutions to create motivation for fundamental industries development.* Complete preferential policies for the development of fundamental industries alongside with tax incentives, and supplement incentives for raw material areas development, and support businesses for technology, capital investment, business mergers and acquisitions... Shift from applying the sub-sector, and specific industrial products incentives approach to incentives for whole ecosystem, and product and services value chain. Review and improve policies on incentive and investment attraction in a synchronized, coordinated, unified manner, in line with the investment attraction policy based on quality, efficiency, and prioritizing projects that use high technology, energy-saving, environmentally friendly, and linking with technology transfer.

3- *Making planning and mechanisms, policies to encourage the development of supporting industrial zones, clusters, and specialized industrial zones for some Fundamental industries.* Develop and implement the National Program on enhancement of the independent, self-reliant, and self-sufficient capacity of Vietnam's production until 2045 (*Make in Vietnam 2045*) with preferential, breakthroughs, and specific mechanisms for the fundamental industries development, especially with the focus on the development of the information technology industry towards software industry, digital content, and gradually developing the hardware industry in certain areas.

4- *Emphasizing on the absorption and assimilation of advanced technologies to serve the development of fundamental industries.* Intensify technology research and learning, gradually master the design, foundational technology of some fundamental industries. Formulate major national science and technology projects to focus on fundamental industries, solve

particularly important issues in the process of industrialization and modernization. Prioritize the investment projects with high technology from large multinational companies associated with knowledge and technology transfer, especially in fundamental industries. Improve incentive policies in a flexible manner based on practical efficiency for the Vietnamese side, focusing on benefited enjoyed added value and technology transfer.

*5- Allocating and arranging resources for fundamental industries.* Allocate resources for fundamental industries reasonably and have preferential mechanisms and policies strong enough to develop fundamental industries. Adjust and concentrate credit mainly on production sectors and fundamental industries.

*6- Timely honor and promptly reward organizations and individuals with achievements in fundamental industry development.* Encourage timely the development, honor and reward scientists, entrepreneurs leading in the process of industrialization, modernization, especially those mastering core technologies and foundational technologies in fundamental industries. Build an advanced, distinctive, and internationally integrated Vietnamese business culture.

*7- Strengthening international cooperation to serve the development of fundamental industries.* Actively expand and deepen international cooperation, especially focusing on cooperation in science and technology to enhance the attraction of external resources for research, application, transfer, and development of modern technologies, green technologies serving the development of fundamental industries; actively and effectively participate in the global innovation and startup network, and the global innovation and startup network associated with fundamental industries. Implement the coordinated, innovative, and effective economic diplomacy to serve the development of fundamental industries. Effectively utilize and exploit the network of strategic, and comprehensive partners to build and implement strategies, programs, and plans for industrial development. Research and establish strategic partnerships in some fundamental industrial sectors./.

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