Scheme on development of bioindustry in the field of environmental protection to 2030

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Over the years, biotechnology in Vietnam has made rapid progress and is now gradually being brought to an industrial scale. In the field of environmental protection, in order to promote the development and application of biotechnology, the MONRE has issued supporting policies such as: Developing and submitting to the Prime Minister to promulgate Decision No.1660/QD-TTg dated 7 November 2012 on "Scheme on development and application of biotechnology to environmental protection to 2020". However, activities of the Scheme have only stopped at implementing a number of ministerial-level subjects of the MONRE on monitoring, conservation and treatment of residual persistent wastes and chemicals, so they have not met the requirements of environmental protection. Especially now, with the economic development and industrial modernization, the process of environmental pollution is very complicated with scale and severity, requiring pollution treatment technology not only to be effective but also environmentally friendly. In order to improve the efficiency and scale of biotechnology application in the environmental sector and additionally promote the role of the environmental biotechnology sector as an economic sector contributing to GDP, the Prime Minister has promulgated Decision No. 553/QD-TTg dated 21 April 2017 approving the Master Plan for the development of bioindustry to 2030. Accordingly, on 24 December 2024, the Prime Minister promulgated Decision No. 1639/QD-TTg approving the Scheme on development of bioindustry in environmental protection to 2030.

Status of development and contribution of environmental industry to socio-economy in Vietnam

It is estimated that in the next 10 years, when the country's GDP doubles, if there is no solution, environmental pollution will increase 3 times, and by 2030 it could be 4 to 5 times the current pollution level. Economic losses due to industrial pollution affecting human health in Vietnam are currently about 0.3% of GDP, increasing to 1.2% of GDP in 2016. According to a research by the Vietnam Institute of Strategy and Policy for Industry and Trade, the need for investment in environmental protection in 18 sectors and fields that have great impacts on the environment such as alcohol, beer, soft drinks, seafood, paper, textiles & garment, steel... is up to VND120,000 billion, equivalent to USD7.6 billion. Urban pollution also poses many problems when the need for urban environmental protection in 20 provinces and cities (in the survey) requires up to VND 85,000 billion... These are quantifiable losses and investment needs. The above bases affirm the importance of environmental industry in Vietnam.

The context of Vietnam's import and export turnover of environmental goods and services (according to APEC's classification of environmental goods and services) in the 2010-2015 period shows that the average growth rate reached 20% per year and the turnover increased from USD 2.7 billion in 2010 to USD 5.3 billion in 2015. Of which, the market share of Vietnam's environmental goods and services only accounts for about 10-15%. Bioindustry enterprises are still limited in both quantity and scale, with low charter capital (52.6% of enterprises are small-scale with capital under VND 5 billion, the number of large-scale enterprises with capital over VND 500 billion accounts for only about 2.84%). Environmental industry enterprises mainly focus on the service sector, while there is a lack of strong enterprises to solve the country's big and important problems. The products and equipment supplied to the market are mainly mechanical products, simply manufactured, at low level, enterprises have not paid attention to investing in product research, development, improvement, and technology innovation. This weak industry has not met the annual demand for urban wastewater treatment, solid waste processing and recycling, and hazardous waste treatment.

In the structure of environmental enterprises in 2011, up to 50.97% of enterprises registered to operate in the field of waste collection, treatment and disposal, scrap recycling and 33.62% in the field of water exploitation, treatment and supply. Only 13.47% of enterprises registered in the field of water drainage and wastewater treatment and only 1.94% registered to operate in pollution treatment and other waste management activities. Initial statistics show that in 2007, in the field of wastewater treatment, the whole country had only 36 enterprises registered to operate (Industry code E), but by 2010, the number had increased to 153 enterprises. In the field of solid waste collection and treatment,

there were 270 enterprises in 2007 and by 2010, there were 463 enterprises. At the end of 2012, according to a survey by the Vietnam Environment Administration (MONRE), there were 3,982 enterprises registered to operate in the field of environmental services, of which 3,581 enterprises were established in the 2006-2012 period, and in the 2006-2009 period alone, there were 2,321 enterprises established and registered to operate in this field. For the field of wastewater treatment, in the 2007-2010 period, the average growth rate of registered enterprises reached 62%/year, the growth rate of labour force reached 45%/year, and the average growth rate of capital reached 78%/year. In the field of solid waste collection and treatment, the growth rate of the number of enterprises reached 20%/year in the 2007-2010 period, the increase in labour reached 8%/year and the increase in capital reached 36%/year.

Although there are no complete statistics, it can be seen that the quality of environmental services and products has been formed and plays an important role in environmental protection. However, in reality, it has not yet demonstrated its true role and potential, has not met the actual requirements of environmental protection and brought economic value. Currently, many recycling fields such as waste oil, waste plastic, waste electrical & electronic products, etc. have almost undeveloped. Meanwhile, attracting investment capital into developing environmental bioindustry and saving energy is still low, not commensurate with the requirements of society. The environmental service sector still relies mainly on funding from the State budget, especially in the field of urban wastewater treatment services. In addition, environmental bioindustry enterprises in Vietnam are not really linked to the development of scientific research, as well as scientific and technological achievements domestically and internationally. This has reduced many advantages and real development directions for environmental industry, significantly reducing the competitiveness of Vietnamese enterprises in both the domestic and foreign markets.

Develop biotechnology in environmental protection in a sustainable and friendly direction

In order to develop the bioindustry in environmental protection in a sustainable and friendly direction, to control and improve environmental quality and effectively use natural resources; to enhance the potential for research, application and mastery of biotechnology in environmental protection in the region and the world, the Prime Minister promulgated Decision No. 1639/QD-TTg dated 24 December 2024 approving the Scheme on development of bioindustry in environmental protection to 2030.

The Scheme sets out specific objectives such as implementing research and development of biotechnology in environmental protection in the direction of mastering core technologies, advanced biotechnology to produce waste treatment preparations in the production and processing of agricultural, forestry and aquatic products, medical waste treatment products; industrial, health care and domestic waste treatment products; in addition, promoting the establishment and development of at least 10% of enterprises producing industrial-scale biological preparations used in waste treatment and equipment lines for producing biological products in environmental protection; investing in developing human resources and key laboratory facilities to meet the needs of developing bioindustry in environmental protection, focusing on developing biological preparations in waste treatment; completing the system of legal documents and national database on the development of technologies and bioindustry in environmental protection.

Based on the overall review of Vietnam's environmental protection guideline, the National Environmental Protection Strategy to 2030 with a vision to 2050, the Scheme sets out the main contents for developing and applying biotechnology in environmental protection as follows: Build and improve the system of legal documents, mechanisms and policies to promote the development of biotechnology in environmental protection; Research, develop and apply biotechnology in monitoring and assessing environmental quality; Research, develop and apply environmental bioindustry in the production of biological preparations and materials to treat wastes that pollute the environment; Research, manufacture, upgrade and produce equipment and production lines for the production of biological products and waste treatment in environmental protection; Develop and apply bioindustry in incident response, environmental restoration and development of natural ecosystems, environmental protection; Apply environmental bioindustry in recycling and producing environmentally friendly products and materials; Develop information systems and national database on bioindustry in environmental protection; Strengthen international cooperation in the field of bioindustry in environmental protection; Communicate to raise awareness of bioindustry in environmental protection.

Promote technology research, application, transfer, and mastery of production technology

To implement the above contents, the main solutions proposed are solutions on science and technology development,

policy, investment and finance, resource development, international cooperation and communication, specifically:

Development of science and technology

Promote technology research, application, transfer, and mastery of technology of producing bioindustry products for environmental protection; prioritize the application of modern and synchronous bioindustry research results in production and business.

Use science and technology budget to support research, reception, decoding, development, and purchase of new technologies in the field of biotechnology from abroad to develop bioindustry enterprises. Support, encourage enterprises to increase investment in technology research and innovation, reception and transfer of advanced biotechnology, widespread and effective application of technical advances and new technologies to produce and trade key products and goods in the field of environmental bioindustry.

Promote and invest in depth in centers supporting the development of biological enterprises in a number of scientific and technological research units to create an effective bridge between scientific research units and enterprises in order to promptly apply new technologies in production.

Strengthen the application of modern, synchronous, environmentally friendly technologies, suitable to the characteristics of the environmental protection sector, apply biology and biotechnology in environmental pollution treatment.

Build pilot models, provide policy and technical solutions, advanced technologies in producing and perfecting products in the chain from research to production, trade and consumption, access the 4.0 technology platform between economic sectors, create the premise for sustainable and environmentally friendly development of biotechnology, thoroughly and effectively use technologies and raw materials.

Policy

Promulgate or submit to competent authorities to promulgate policies to support the development of bioindustry in environmental protection.

Review, develop and promulgate regulations on the development of bioindustry in environmental protection.

Develop, coordinate with line ministries and sectors to promulgate regulations on training and developing human resources for the development of environmental bioindustry.

Investment and finance

Review and submit to competent authorities to promulgate and improve policies and mechanisms to encourage enterprises to invest in industrial-scale production and commercialization of biotechnology products according to market mechanisms, including: Incentive policies for investment in development of investment projects and establishment of bioindustry enterprises, incentive land use tax, loan support, technology transfer support; Incentive policies on corporate income tax, import-export tax, income tax; attracting and diversifying domestic and foreign investment resources for the development of environmental bioindustry; Selecting focused investments, key sources of budget capital combined with non-budgetary investment capital; Effectively organizing for implementation and closely managing programs, schemes, projects on developing and applying biotechnology in environmental protection; funding for short-term training, funding for technology reception, and technology decoding from countries with technology sources suitable for the development orientation of environmental bioindustry;

State budget capital is used for implementing scientific and technological tasks and supporting budget capital based on orders from local authorities, enterprises, specialized state management agencies in the country, evaluation and appraisal opinions of the Scientific Advisory Council; investing in infrastructure, machinery, equipment and human resources for the enterprise supporting center; investing in building the key biotechnology laboratory of the MONRE; infrastructure for quality control, monitoring, assessment of biosafety of biotechnology products and strengthening technical facilities, machinery and equipment for biotechnology laboratories of research institutes and universities

by region; training human resources, implementing international cooperation tasks and some other related contents of the Scheme;

Develop and coordinate with line ministries and sectors to promulgate regulations on management and control of biosafety for biotechnology products in accordance with Vietnamese and international policies and legislations; on training and developing human resources for environmental biotechnology development in particular and related sectors in general.

Development of human and material resources

Invest in-depth, strengthen key facilities, techniques, machinery and equipment in environmental sector to meet the requirements towards modern and synchronous environmental bioindustry; Improve the capacity of scientific research staff of scientific and technological, technology transfer organizations and bioindustry enterprises; Train highly skilled workers to work in biological production enterprises & factories; Implement the planning for training human resources specialized in environmental biotechnology to meet the needs of developing environmental bioindustry, with focus on training a team of highly qualified post-graduate experts and leading experts to master technology for the development of bioindustry; provide short-term and long-term training, and vocational training to ensure quality according to new forms of training.

International cooperation

Promote international cooperation in developing human resources, training technology experts and transferring technology, focusing on cooperation with countries having developed bioindustry;

Strengthen cooperation in importing and transferring technologies and equipment, promote access to and mastery of some important areas of modern environmental biotechnology; purchase copyrights, receive and decode advanced, environmentally friendly technologies and materials; hire foreign experts when necessary;

Create favourable conditions for enterprises to proactively cooperate and receive technology transfer for industrial production of biotechnology products with competitive advantages from abroad.

Communication

Organize propaganda, dissemination and implementation of the contents of the Directive of the Party Central Committee's Secretariat, specifically Resolution No. 36-NQ/TW dated 30 January 2023 of the Politburo on the development and application of biotechnology for sustainable development of the country in the new situation and the Government's Master Plan on bioindustry development to 2030 to create a strong change in the awareness of all levels, sectors and the whole society about the role, position and importance of bioindustry in general, environmental bioindustry in particular for the cause of industrialization and modernization of the country, developing bioindustry into an economic-technical sector that makes great contributions to national economic growth;

Disseminate results of scientific research, technology transfer, and introduce environmental bioindustry enterprise models to the people;

Propagate to encourage all levels, sectors and people to use domestically produced agricultural bioindustry products and build Vietnamese brands;

Organize domestic technology workshops and forums to connect enterprises, science and technology units, domestic and foreign experts to promote cooperation, application, and development of technologies and products. Coordinate with socio-political organizations, unions, and relevant agencies to conduct training to improve communication capacity on environmental bioindustry; develop communication materials, disseminate knowledge on bioindustry;

Continue to build, upgrade and improve the webpage on environmental biotechnology to ensure compatibility and suitability with the national digital transformation program; disseminate information online on environmental bioindustry; provide information on technologies, equipment and technology transfer. Promote information, communication, dissemination and education to raise awareness of ecological environmental protection for all levels, sectors and the entire population.

Biotechnology is a high-tech field based on the foundation of life sciences, combined with processes and techniques to create technologies that exploit the life activities of microorganisms, animal and plant cells for socio-economic development and environmental protection. Starting from the industrial revolutions, biotechnology was transformed into a profit-making industry, called bioindustry.

Bioindustry is defined as the use of biotechnology in processing, industry, medicine, agriculture, food and environment to create a profitable high-tech economic-technical sector. Bioindustry includes the modern application of biotechnology to the sustainable processing and production of chemical products, materials and fuels ▪