



Viet Nam net-zero commitment - Opportunities, challenges and solutions

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Net-zero is an environmental goal that aims to reduce emissions of greenhouse gases (GHGs) such as CO₂, CH₄, N₂O in balance with the earth's ability to absorb or remove emissions, to the point where total net gas emissions are reduced to "zero", contributing to minimizing the impact of climate change according to the Paris Agreement, with the hope of keeping global temperature increase below 2°C and efforts to limit warming to below 1.5°C above pre-industrial levels. To achieve this goal, it is required to reduce emissions from sources such as transportation, industrial production, and electricity; enhance carbon absorption through new afforestation, forest conservation, carbon capture and storage technology. Therefore, the Government and businesses as well as every Vietnamese citizen need to join hands to take useful actions to reduce emissions, and actively support solutions to enhance the ability to absorb carbon, creating a low-emission and more sustainable economy.

1. THE NEED TO REDUCE CARBON EMISSIONS TOWARDS THE NET-ZERO GOAL

Climate change and global warming have become one of the biggest threats to humanity in the 21st century, this is caused by human activities, in which the root cause is the burning of fossil fuels such as coal, oil and natural gas, leading to CO₂ emissions and increasing GHG concentration in the atmosphere. CO₂ concentration in the atmosphere in pre-industrial times (1750) was 280 ppm (IPCC, 2014) and reached a record level of 407.4 ppm in 2018 (IEA, 2019b). IPCC (2018) shows that the global average temperature in the 2006-2015 decade was 0.87°C higher than the average for the 1850-1900 period. Climate models predict that, if strong measures are not taken to reduce fossil fuel use, CO₂ concentration in the atmosphere will reach 700 - 900 ppm by 2100, thereby leading to an increase in global average temperature from 3 - 5°C by 2100 (IPCC, 2014).

On the other hand, in the 1990s, scientists from the Intergovernmental Panel on Climate Change (IPCC) warned that the global average surface temperature would increase by 0.3 - 0.6°C within 100 years from now, however, the IPCC Sixth Assessment Report (AR6) published in 2021 shows that GHG emissions from human activities have caused the earth to warm by 1.1°C since the 1850-1900 period and each decade of the past 40 years has been successively hotter than the previous decades since 1950. Compared to 1901, the average sea level rose 20cm in 2018; the average sea level rise is about 3.7mm per year (from 2006 to 2018). However, the IPCC Special Report also points out that, if the world reaches net-zero by 2040, the chance of limiting warming to 1.5°C will be significantly higher. The earlier and lower the emissions peak, the faster net-zero will be reached, making the Earth less dependent on carbon removal in the second half of the century.

Faced with the above reality, the 26th Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP26) taking place in Glasgow - Scotland, UK (November 2021) is considered the last chance for all countries in the world to fulfill their commitments to limiting global warming under the Paris Agreement. There are 6 main issues of special concern at COP26, including: (i) propose solutions to achieve the goal of carbon neutrality by the middle of the 21st century; (ii) ensure that global temperature increase is maintained below 1.5°C during the industrialization period; (iii) conserve natural ecosystems; (iv) ensure financial funds for climate change; (v) develop a detailed plan for implementing the 2015 Paris Agreement; (vi) discuss possibilities for cooperation in responding and adapting to climate change. COP26 brings great hope to humanity of keeping the global average temperature increase to no more than 1.5°C and achieving net-zero by the middle of the 21st century with promising commitments from leaders. To date, 137 countries made commitments to net-zero; 77 countries, localities and corporations signed the Global coal to clean power transition statement; 45 countries made commitments to transition to green, sustainable agricultural investment; many car companies announced that they will stop producing gasoline-powered vehicles by 2040 at the latest; the US and China released the Joint statement on enhancing cooperation to address the climate crisis... This treaty calls for accelerating efforts to gradually phase out coal power that does not use carbon capture technology and ineffective fossil fuel subsidies, and at the same time acknowledge the need for support towards a just transition. This is considered an important turning point, because for the first time fossil fuels were mentioned in an agreement during a UN climate summit.

In Vietnam, over the past many years, our country has gained encouraging achievements in socio-economic development, in which the energy sector has made a positive contribution to overall development of the country, but it also faces many challenges, especially dependence on fossil fuels, leading to environmental pollution and GHG emissions. Therefore, to address challenges of climate change mitigation as well as sustainable supply and use of energy sources, a transition to a low-carbon economy,



towards net-zero emissions is a necessary and urgent task for our country in the current context. According to the Vietnam Institute of Strategy and Policy for Industry and Trade (Ministry of Industry and Trade), markets are pushing the world towards the highest level of fossil fuel use. The International Energy Agency (IEA) predicts that coal, oil and gas will peak before 2030, therefore, the development and expansion of the use of renewable energy such as solar power, wind power, hydropower and bioenergy are important steps to reduce dependence on fossil energy in Vietnam.

On the other hand, according to data from Vietnam Electricity (EVN), by the end of 2022, there were 8,908 MW of solar power, 7,660 MW of rooftop solar power, 5,059 MW of wind power, 395 MW of biomass power and solid waste power in total power capacity. According to the Power development plan VIII, by 2030, renewable energy sources (including hydropower, solar power, wind power, biomass power) will increase from 38.2 GW (2020) to 73.78 GW; the proportion of renewable energy sources in the capacity structure accounts for 50.3%, although the proportion of hydropower is estimated to decrease from 30% to 20% due to low potential; electricity produced from renewable energy sources accounts for 36%. By 2050, the total capacity of renewable energy sources will be nearly 400 GW, accounting for 69.8% of total power capacity, so Power plan VIII will be the foundation for energy policy in the coming years.

2. VIETNAM'S STRONG COMMITMENT TO IMPLEMENTING NET-ZERO

Sustainable development is a vital factor, determining the fate of human civilization in the new era. In fact, Vietnam has been aware of this issue quite early, as shown in the 11th National Congress of the Communist Party (2011), that approved the Socio-economic development strategy for the 2011-2020 period, with a consistent view of rapid and sustainable development. Next, the UN Summit on sustainable development held on 25th September 2015 in New York (USA) adopted the document "Transforming our world: The 2030 Agenda for sustainable development" with 17 sustainable development goals (SDGs) and their 169 targets. Among the SDGs set for 2030, there are 5 goals directly related to natural resources, environment and climate change issues: (i) Ensure availability and sustainable management of water and sanitation for all (SDG 6); (ii) Ensure sustainable consumption and production patterns (SDG 12); (iii) Take urgent action to combat climate change and its impacts (SDG 13); (iv) Conserve and sustainably use the oceans, seas and marine resources for sustainable development (SDG 14); (v) Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss (SDG 15). Implementing the Party's guidelines and the UN's 2030 Agenda, the Government of Vietnam has issued the sustainable development strategy for the 2011-2020 period; National action plan to implement

the 2030 Agenda for SDGs... which define the development model as green economy, green society, green lifestyle, promoting sustainable consumption, greening the transition process towards equitable, inclusive development and enhanced resilience.

In particular, at COP26, Vietnam officially committed to gradually phasing out coal-fired power by 2040 and achieving net-zero emissions by 2050. After COP26 and COP27, with the drastic direction of the Prime Minister, the National Steering Committee implemented the commitment; relevant ministries, sectors and agencies advised and submitted to the Prime Minister to promulgate many schemes, strategies, master plans and action plans, including the National strategy on climate change; National strategy on green growth; National action plan on green growth; Action program on green energy transition, reduction of carbon and methane emissions; Program on sustainable forestry development; Power development plan VIII towards renewable energy as the main focus; development of 1 million hectares of high-quality, low-emission rice; development and implementation of the nationally determined contributions; promulgation of the Plan for the implementation of the just energy transition partnerships (JETP) mechanism... Next, at COP28, Vietnam once again reaffirmed the determination and efforts of the entire political system, ministries, agencies, sectors, and people in implementing the commitment at COP26, joining hands with the world to fight climate change, at the same time, announced the Plan for mobilizing resources to implement JETP; emphasized that the just energy transition is decisive for achieving Vietnam's national energy development strategic direction, aiming to achieve net-zero emissions by 2050 and sustainable development goals in the spirit of taking people as the centre.

Most recently, in the National strategy on climate change approved in Decision No. 896/QĐ-TTg dated 26th July 2022 of the Prime Minister, Vietnam has declared the goal of ensuring the total national GHG emissions by 2030 decreased by 43.5% compared to the business as usual scenario (BAU), of which the energy sector decreased by 32.6%, emissions not exceeded 457 million tons of CO₂ equivalent (CO₂eq); the agricultural sector decreased by 43.0%, emissions not exceeded 64 million tons of CO₂eq; emissions in forestry and land use sectors decreased by 70% and carbon absorption increased by 20%, total emissions and absorption reached at least -95 million tons of CO₂eq; the waste sector decreased by 60.7%, emissions not exceeded 18 million tons of CO₂eq; the industrial processes



sector decreased by 38.3%, emissions not exceeded 86 million tons of CO₂eq; establishments with annual GHG emissions of 2,000 tons of CO₂eq or more must reduce emissions. By 2050, ensure the total national GHG emissions reached the net-zero emissions; emissions peaked in 2035, then decreased rapidly, of which the energy sector decreased by 91.6%, emissions not exceeded 101 million tons of CO₂eq; the agricultural sector decreased by 63.1%, emissions not exceeded 56 million tons of CO₂eq; emissions in forestry and land use sectors decreased by 90%, carbon absorption increased by 30%, total emissions and absorption reached at least -185 million tons of CO₂eq; the waste sector decreased by 90.7%, emissions not exceeded 8 million tons of CO₂eq; the industrial processes sector decreased by 84.8%, emissions not exceeded 20 million tons of CO₂eq; establishments with annual GHG emissions of 200 tons CO₂eq or more must reduce emissions.

3. OPPORTUNITIES AND CHALLENGES TO IMPLEMENT NET-ZERO IN VIETNAM

3.1. Opportunities

Reality shows that Vietnam has many advantages in natural, social and human factors, which is great potential to promote the implementation of green growth such as: Abundant carbon reserves from natural forest resources, accounting for more than 40% of the country's total terrestrial area; hot and humid weather in the equatorial region, which is the condition for the development of tropical forests with large carbon reserves; strong renewable energy development resources thanks to its prime geographical location in the near-equatorial area, with lots of sunshine and a long, windy coastline... On the other hand, in recent times, the topic of green growth and sustainable development has always been an issue of concern for the Party and the State, right after the COP26, the Prime Minister approved the National strategy on green growth for the 2021-2030 period, with a vision to 2050. To realize the Strategy, the Prime Minister has issued the National action plan on green growth, aiming at 4 important target groups, including reducing GHG emission intensity per GDP; greening economic sectors; greening lifestyles and promoting sustainable consumption; greening the transition process on the principles of equality, inclusion, and enhanced resilience. Accompanying the action plan, there are a series of solutions and policies to concretize goals associated with innovating growth models, ensuring harmonious development in all three aspects: economic prosperity, environmental sustainability and equitable society. This is a fairly comprehensive plan, which is important in realizing the commitment to achieving net-zero emissions by 2050 as well as Vietnam's determined contributions.

Particularly, the Ministry of Planning and Investment, as the national focal point for green growth, has coordinated with ministries, sectors and local authorities to focus on implementing the action plan to promote green, clean, sustainable energy transition and strengthen the management and development of industrial parks and clusters; convert regular buses to electric buses, at the same time research, negotiate and implement new mechanisms to mobilize resources from outside; strengthen international cooperation activities to exchange experiences in promoting green

growth... In particular, the Ministry is urgently completing and submitting to competent authorities to develop a set of scientific criteria on national green classification, ensuring harmony with international practices, this is an important legal framework in implementing green growth, helping agencies have a specific legal basis in selecting investment projects in ministries, sectors and local authorities; quantifying and evaluating the progress of green growth.

In addition, Vietnam's strong commitments and responsible contributions at COP26 were highly appreciated by the international community, opening up many opportunities for cooperation on low-emission growth, promoting development of circular economy, adapting to climate change. In other words, Vietnam is following the mainstream of the global development trend along with developed countries having economic and high-tech potential. The commitment to the achievement of net-zero emissions has sent a strong signal to the international community, opening up and creating favourable conditions for the country to take advantage of the shift of global financial resources for low-emission development and effective response to climate change. In particular, thanks to many advantages in switching to renewable energy, Vietnam can attract green finance from the committed financial package provided by countries with 100 billion USD per year for the development of green economy, circular economy and renewable energy, staying ahead of investment and credit flows from credit and financial institutions around the world... at the same time, take advantage of cooperation opportunities on low-carbon technology transfer, reducing dependence on fossil fuel sources, unlocking the potential of renewable energy, including developing offshore wind energy...

3.2. Challenges

According to the BAU scenario, Vietnam's total emissions by 2030 are expected to be 932 million tons, of which the energy sector accounts for 680 million tons, so achieving the net-zero goal is a very huge challenge. Furthermore, the GHG emission reduction roadmap proposed at COP26 requires all countries to strongly transition to low-emission development and to achieve this goal, energy transition towards ending the use of coal is an issue that Vietnam needs to make great efforts, in which energy is the sector that must be given top priority, because this is the sector with the largest emissions. According to calculations by the MONRE (2020), in the energy sector, 60% of emissions come from the energy industry - mainly from electricity production, and according to the



BAU emission scenario of Vietnam, it is expected that by 2050, 81% of emissions will come from the energy sector, so energy will be the sector that determines Vietnam's net-zero goal.

The Global Wind Energy Council (GWEC) believes that to achieve the net-zero goal, it is necessary to stop implementing new coal projects, as well as provide a roadmap to phase out current coal projects. With the global trend shifting away from fossil fuels, the coal era is ending and new coal projects will face many difficulties in mobilizing finance. Currently, our country's coal power capacity reaches about 21.3GW, contributing 50% of total electricity output, this number will also increase to 40.9GW in 2030 and up to 50.9GW in 2035 (According to the Power plan VIII). In particular, with 15.8GW of estimated power source capacity that has not yet been financed in Power plan VIII, it will be a big challenge when Vietnam sets the net-zero goal by 2050 because there are more than 100 financial institutions announced to withdraw from coal mining projects and coal power plants to achieve the goal of reducing carbon emissions. Experts say that, on the path to achieving the net-zero goal, Vietnam is facing two big challenges: Firstly, in terms of capital sources, according to the World Bank, by 2040, Vietnam will need 368 billion USD to achieve the net-zero goal, but the State Bank's statistics show that Vietnam's green credit balance as of 30th June 2023 only reached nearly 528.3 trillion VND, accounting for a proportion of about 4.2% of total outstanding public debt of the entire economy. On the other hand, international financial capital for green development is no longer cheap, while interest rates of the Federal Reserve (US Central Bank - FED) and European countries are at very high levels, therefore finding capital for green development in Vietnam is no

small challenge, because capital from international financial institutions is still important in the long term to move towards green bonds and green credits. The second includes innovation capacity with green development, infrastructure and production conditions; training human resources and workers; governance standards and information disclosure standards. This leads to the fact that not all businesses are willing to participate in the transition process, especially in terms of investment capital and operating activities.

4. THE KEY SOLUTIONS FOR THE COMING TIME

To achieve the net-zero goal by 2050, Vietnam needs to focus on implementing the following key solutions:

Firstly, it is necessary to continue to improve the policy and legal system to promote green growth and develop the circular economy; guide and effectively implement provisions on responsibilities, roadmaps, and methods to reduce GHG emissions of the Law on Environmental Protection 2020 as well as documents under the Law. In particular, special attention should be paid to developing the domestic carbon market and expanding, connecting with the international carbon market; implementing emission quota allocation; developing carbon exchange & offset mechanism, and credit certification mechanism... to encourage businesses, people, especially rural areas, to implement many carbon recovery solutions through economic activities such as afforestation, greening of bare land, waste treatment to recover carbon... This is not only a simple economic activity but also makes an important contribution to carbon recovery, reducing net emissions, moving towards net-zero.

Secondly, promote propaganda, awareness raising for businesses, people and the whole society about the important role of reducing GHG emissions and protecting the atmosphere, first of all by strengthening capacity for state management officials in all sectors, moving forward to universalizing knowledge about GHG emissions through the national education system, training and fostering programs for officials at all levels. At the same time, organize forums, conferences, seminars, cultural and artistic programs to integrate advocacy and propaganda; organize exhibitions displaying products and



▲ Vietnam's commitment to achieving net-zero by 2050 affirms its determination to implement global goals



technology, launch creative competitions on GHG emission mitigation... thereby calling, mobilizing businesses, organizations and people to actively participate in GHG emission mitigation activities.

Thirdly, Vietnam needs to plan the national power grid until 2030 and a roadmap to 2050, which prioritizes public investment, strengthens the power transmission network, has alternative energy solutions, and attracts private projects on wind energy, solar energy, hydrogen energy, biomass energy... Synchronously invest in infrastructure and technology in the energy sector, gradually reduce towards ending dependence on foreign technology in the new energy sector, at the same time, have preferential policies to encourage and create favourable conditions for businesses to develop and use new energy in production and business.

Fourthly, research to establish a national renewable energy centre to develop human resources, transfer technology, share experiences and national governance in this sector. At the same time, it is necessary to promote climate diplomacy, mobilize to attract international resources (public and private financial sources, technology, knowledge, experience...) through exchanges and high-level visits, working programs of ministries, sectors and local authorities with foreign partners and Vietnamese representative agencies abroad; take advantage of all the opportunities that JETP offers; focus on creating a favourable legal environment and strengthening governance capacity to effectively use loans and investments for clean energy and renewable energy development. In addition, it is necessary to improve policies to promote innovation, technology transfer, digital transformation and human resource development, which are important factors for the green transformation process, towards the net-zero goal by 2050.

5. CONCLUSION

From net-zero commitment to specific, practical actions is a long journey for a developing country like Vietnam, requiring a clear awareness of green transformation, development and implementation of low-emission production and business models, but this will also be a time and opportunity for Vietnam to enhance its position in the international arena, affirming its determination to act together to realize the global goals; an opportunity for our country to restructure the economy, transform the growth model based on knowledge, digital transformation, green transformation, high-quality human resources, science and technology, leading the country to develop along the “green path”, with high income by 2045. In this journey, the joint coordination between the Government, people and businesses is a key factor, making an important contribution to ensuring economic development associated with environmental protection, towards the sustainable development goals ■

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The Environmental Performance Index (EPI), developed by Yale University (USA) since 2006 and published every 2 years, integrates various indicators in different fields to assess the efforts of countries in achieving environmental goals. According to the latest EPI report released in June 2024, Vietnam's score has continued to decline. This article focuses on updating the methodology of the EPI and the results of Vietnam's EPI performance for 2024.

THE ENVIRONMENTAL PERFORMANCE INDEX (EPI)

The first Environmental Performance Index (EPI) framework was constructed based on two main environmental objectives: (i) environmental protection for human health, also known as environmental health, and (ii) protection of the natural habitats, also known as ecosystem vitality. However, since 2022, the EPI framework has been adjusted to consist of three policy objectives: (i) Environmental Health, (ii) Ecosystem Vitality, and (iii) Climate Change.

The EPI 2024 utilizes the latest data, science, and technology to provide the most comprehensive assessment of global sustainability. In total, the EPI integrates data on 58 performance indicators grouped into 11 environmental issue categories to rank 180 countries based on progress in mitigating climate change, protecting ecosystem vitality, and promoting environmental health. The 11 issue categories include: (1) Biodiversity and habitat; (2) Forests; (3) Fisheries; (4) Air pollution; (5) Agriculture; (6) Water resources; (7) Air quality; (8) Sanitation & Drinking water; (9) Heavy metals; (10) Waste management; and (11) Climate change mitigation. This broad set of metrics is a powerful tool to track progress towards the UN Sustainable Development Goals, the climate mitigation targets in the 2015 Paris Climate Change Agreement, and the biodiversity protection goals in the Kunming-Montreal Global Biodiversity Framework.