

EU Trade Policy: Liberalization, Regionalization, and Greenization

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Abstract

Currently, the EU's core position in global geopolitics, diplomatic relations, and economic trade is increasingly prominent. The EU adheres to effective multilateralism and advocates free trade. It has established diplomatic relations with over 160 countries and strategic partnerships with multiple parties. In 2010, the EU actively promoted the construction of banking alliances, capital market alliances, energy alliances, and a single digital market. In 2016, the EU adopted the basic action plan of "Common Vision, Common Action: A Stronger Europe". In 2022, the "Strategic Compass" action plan was approved to plan the future security and defense policies of the European Union. As an important driving force for the development of global trade, the EU adheres to the free trade policy orientation, actively maintains the multilateral trading system, attaches importance to the development of regional trade liberalization, and constantly strengthens the concept of green trade, which will undoubtedly play a key role in the transformation of international trade in the future.

Key words: EU; Trade policy; Liberalization; Regionalization; Greenization

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2023 is a crucial year for China to comprehensively promote high-level opening-up to the outside world, and deepening economic and trade cooperation with EU

countries is of great strategic significance. For a long time, the European Union has been the main advocate of global free trade, adhering to the principle of "trade is open by rules to manage globalization" and advocating for "international trade is open, rule-based, and competitive". Currently, when formulating trade policies, the EU emphasizes the construction of a multilateral trade cooperation framework and the strengthening of regional bilateral trade cooperation. In promoting the implementation of multilateral and bilateral trade agreements, environmental protection, food safety, green trade and other contents have been effectively added. In order to effectively respond to the new challenges brought about by the changes in EU trade policies, China should strengthen EU trade policy research, especially the more protective liberalization, regionalization and greening visions and trends in EU trade policies, as well as the "Hard power" of EU trade security, and comprehensively promote China's economic and trade cooperation with the EU to achieve mutual benefit, win-win results and sustainable development.

1. THE EUROPEAN UNION IS THE MAIN ADVOCATE OF GLOBAL FREE TRADE POLICY

1.1 Europe is the Birthplace of Free Trade

According to the history of free trade in Europe, from the 12th century onwards, different regions of Europe began to accept more democratic ideals, giving merchants and craftsmen more say in governance. Affected by this, vibrant trade centers were established in Venice, Genoa, Bruges, Antwerp, and Amsterdam. The cities of Venice, Genoa, Florence, and Milan in northern Italy have achieved high levels of commerce and trade, making them a leading trading center in the Mediterranean region. The

connection between Venice and the Byzantine Empire made it control the trade between Europe and Levant in the eastern Mediterranean. Venetian merchants became very rich through the trade in spices, silk, perfume, iron, wood, salt, and other commodities. Open economic and trade policies have promoted these cities to become international trading powers, bringing a large amount of wealth to cities and their residents.

In order to help promote their trading enterprises, Venetians and Genoese both established banks in their main trading centers, forming the first international banking system to facilitate the purchase of goods, currency exchange, and settlement between trading parties. Bank of Italy has set up branches in Spain, Portugal, Bruges, Antwerp and London, which has facilitated a large number of international trade in these places, and has also played a catalytic role in trade in Europe and other regions. The European Renaissance brought progress in navigation instruments, map making, and shipbuilding. The Portuguese people initially took the lead in establishing new trade routes with the East Indies and Spice Islands, and managed to establish trade points in Africa, the Indian subcontinent, the Indonesian archipelago, the Malayan Peninsula and China. The main commodities traded are spices, such as nutmeg, cloves, nutmeg, cinnamon and pepper. This business activity is called Spice trade.

In the sixteenth and seventeenth centuries, influential European politicians and government advisers viewed the global economic system as a zero sum game. The mechanism for accumulating more wealth is to ensure that a country exports more wealth than imports. Maintaining a trade surplus will increase a country's wealth. In order to achieve this positive Balanced trade, the mainstream view is that the role of the government is to maintain policies that encourage exports and prevent imports. This economic mode is called Mercantilism. The Dutch ruled the sea and world trade in the 17th century, which is known as the Dutch Golden Age of Holland. Amsterdam has become the most important trading center in Europe and also the central commodity market in Europe. In the 18th and 19th centuries, the Dutch Golden Age of the Netherlands was replaced by the rise of the British Empire, and Britain became the dominant international trading country. In 1860, free trade policies made significant progress throughout Europe and had a positive impact on economic growth, providing a more level playing field for international trade.¹

1.2 The Establishment of the European Union Is a Solid Foundation for Free Trade

The Treaty of the European Coal Safety Commission

came into effect on July 25, 1952, laying the foundation for a common market for the coal and steel industries. The six founding member states are Belgium, the Federal Republic of Germany (former West Germany), France, Italy, Luxembourg, and the Netherlands. The European Economic Community and the Euratom signed the Treaty of Rome on March 25, 1957, establishing the European Economic Community. The goal of the European Economic Community was to gradually integrate the economies of all countries, form a common agricultural and industrial market, and realize the free flow of goods, people, services and capital.

In July 1967, the European Community, the European Economic Community and the Euratom were merged into the European Community, and the Customs union was established the following year. In December 1969, the European Community began negotiations on membership with the United Kingdom, Ireland, Denmark, and Norway. In January 1972, a member state treaty was signed, allowing these four countries to become members of the Community starting from January 1, 1973. The UK, Ireland, and Denmark were scheduled to become member states, but Norway had decided not to join after a national referendum. In the 1980s, Greece, Portugal, and Spain became members of the European Community, which made progress in eliminating trade barriers and establishing domestic markets.

The European Union signed the Treaty of the European Union, also known as the Maastricht Treaty, on 7 February 1992. It came into effect on November 1, 1993 and initially had 12 member states: Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and the United Kingdom. After Austria, Finland, and Sweden joined on January 1, 1995, the economic and political alliance reached 15 member states.² As of the end of 2022, there were 27 EU member states with a total population of approximately 450 million.

The free flow of goods is one of the four fundamental freedoms of the EU, and together with services, capital and people, it forms the cornerstone of the single market. The reason for the EU's open market has always been to promote economic growth and enhance competitiveness, thereby promoting employment and economic prosperity for residents. The single commodity market legislation based on the EU Operational Treaty aims to ensure that products placed on the EU market meet high health, safety, and environmental requirements. In 2016, 75% of the EU's internal trade was in goods, accounting for 21% of the EU's gross domestic product. The volume of trade in goods between EU member states had reached 3.1 trillion euros, and the elimination of trade barriers could

¹ The Development of Free Trade in Europe - Hillsdale College. <https://www.hillsdale.edu/educational-outreach/free-market-forum/2008-archive/the-development-of-free-trade-in-europe/>

² History of European union. <https://www.euroekonom.sk/download2/operacie-v-zahranicnom-obchode/Foreign-trade-operations-History-of-European-union.pdf>

inject 183 billion euros into the Economy of the European Union.³

1.3 Free Trade Is the Main Trade Policy of the European Union

Most of the EU's policy-making is aimed at reducing non-tariff trade barriers. These may be different product standards, health and safety regulations, tax systems, or currency depreciation. Since the establishment of the European Economic Area in 1994, the EFTA countries Iceland, Norway and Liechtenstein (but not Switzerland) had also been part of the single market. European institutions consult European Free Trade Association countries when making decisions on the single market. Free flow of goods in the case of uncoordinated products, Member States may adopt national rules, but the EU ensures that these rules do not constitute inappropriate non-tariff barriers. Mutual recognition of national product standards, specifications, etc. is the guiding principle here.

However, this principle of mutual recognition is not absolute, as member states can still restrict imports if higher principles such as public health, safety, and consumer protection are threatened. In addition, the European Organization for Standardization is increasingly replacing national standards with voluntary standards within the EU, which supplement the coordinated 'basic requirements'. For example, Europe has standards for firefighting tools and hospital equipment. In addition, when companies seeking cross-border trade encounter regulatory barriers, they must bear the cost of compliance in order to fully utilize the potential of a single market.

Data shows that from 1992 to 2006, the European single market created 2.75 million jobs. From 1992 to 2002, this increased the wealth of the European Union by 877 billion euros. Since 1992, the share of foreign direct investment in the EU's gross domestic product has increased by another quarter. About 75% of EU internal trade is trade in goods, which accounts for 21% of the EU's gross domestic product. In 2016, the trade volume of goods between member countries reached 3.1 trillion euros, which has steadily increased since 2003. EU consumers benefit from lower prices, EU wide consumer legislation, environmental protection standards and safety rules in the manufacturing industry. The EU has significantly promoted trade activities by abolishing non-tariff barriers, and the trade of goods in the internal market is 73% higher than that of free trade zones.⁴

After the outbreak of the international economic crisis in 2008, unlike during the Great Depression of the 1930s, the European Union did not take protectionist

measures to contain the economic recession. At that time, the mainstream view was that trade liberalization was indispensable for restoring growth during periods of austerity and private deleveraging. The post crisis EU trade policy had shown asymmetric continuity, and the trend of liberalization had been more thoroughly restored. Research has shown that this economic crisis has strengthened the trend of trade liberalization in the European Union, especially as the EU begins to attempt bilateral trade agreement negotiations with the United States, Japan, and Canada. (Bollen, Ville & Orbie, 2016)

2. THE EU PLACES GREATER EMPHASIS ON BILATERAL FREE TRADE AGREEMENTS IN ITS TRADE POLICY

2.1 Problems in the Current Multilateral Trading System

The World Trade Organization (WTO) was established in 1994, its predecessor being the General Agreement on Tariffs and Trade (GATT), which was established in 1947. Since its establishment, the World Trade Organization has made significant contributions to promoting world economic growth and enhancing global trade levels. At present, the trade volume of the WTO accounts for 95% of the total world trade volume, so it can be said that the role of the WTO in the field of world trade is irreplaceable. However, due to external factors and its own shortcomings, the current multilateral trading system led by the World Trade Organization has fallen into a predicament.

One is the impact of regional trade agreements on the multilateral trading system. Regional trade agreements refer to international treaties concluded between two or more countries or different tariff regions in order to eliminate various trade barriers among members and regulate trade cooperation between them. Although it exists as an exception to the Most favoured nation principle, it has developed at an amazing speed in international trade. As of now, there are a total of 339 trade agreements worldwide, with 186 regional trade agreements in Asia alone, accounting for 54.9% of the global total. For example, the Trans Pacific Economic and Trade Partnership (TPP) and the Trans Atlantic Trade and Investment Partnership (TTIP) encompass almost all developed countries in the world.

The second is that the gap and contradictions between North and South hinder the development of the multilateral trading system. For a long time, the contradictions between developed and developing countries in international trade have not been effectively resolved. Under the framework of the multilateral trading system led by the WTO, developed countries have received the greatest benefits, while emerging economies have limited benefits due to their limited economic level,

³ KEY STATISTICS and TRENDS in International Trade 2022. https://unctad.org/system/files/official-document/ditctab2023d1_en.pdf

⁴ Free movement of goods within the EU single market | Epthinktank | European Parliament. <https://epthinktank.eu/2018/01/19/free-movement-of-goods-within-the-eu-single-market/>

and the least developed countries have a tendency to be marginalized. At the same time, developed countries with dominant power are still unwilling to share the power to formulate international economic and trade rules with rising stars, hindering the development of the multilateral trading system.

Thirdly, new trade protectionism has had an impact on the multilateral trading system. With the deepening development of international economic and trade activities and the increasingly fierce international competition, new trade protectionism has emerged. New trade protectionism is mainly manifested in non-tariff barrier measures such as green barriers, technical barriers, anti-dumping, and intellectual property protection. Its purpose is to avoid the constraints of the multilateral trading system, protect domestic industries and employment, and maintain its dominant position in international division of labor and exchange. Therefore, new trade protectionism poses a serious challenge to the WTO, which is committed to promoting world trade integration.

Fourthly, the shortcomings of the WTO itself urgently need to be addressed. Due to the fact that the management services of GATT were originally limited to trade in goods, but currently the WTO involves too many fields, it is difficult to coordinate the interests of member states; The consensus decision-making mechanism itself does not specify voting or specific decision-making rules; Mandatory dispute resolution mechanisms may not necessarily apply to all issues; The package of commitments cannot adapt to the complex reality of the WTO; The degree of trade liberalization in some current WTO rules is clearly not high enough; The vague content of some current WTO rules leads to their abuse.

2.2 The EU Actively Promotes the Reform of the Multilateral Trading System

The EU is a staunch supporter of the multilateral trading system established by the World Trade Organization and believes that there is an urgent need for reforms to restore the ability to negotiate new rules, ensure transparency and supervision, improve dispute resolution to restore the multilateral trading system, and achieve the ultimate goal of preventing its collapse. Specifically, the EU's proposal on WTO reform focuses on: resolving the crisis of the Appellate Body (short-term); Develop new rules and disciplines on industrial subsidies and mandatory technology transfer; Create transparency by improving compliance with notification obligations. The European Union and the United States have established similar positions regarding new rules on industrial subsidies, transparency, and the development status of self declaration.

On November 26, 2018, the EU and other members of the World Trade Organization - Australia, Canada, China, Iceland, India, South Korea, Mexico, New Zealand, Norway, Singapore and Switzerland - announced a

specific reform proposal to overcome the current impasse in the WTO Appellate Body. The proposal proposed that new rules should be formulated for the outgoing members of the Appellate Body to clarify under what circumstances they can stay to complete the ongoing appeal process; Ensure that the appeal process is completed on time in accordance with the 90 day deadline set by WTO rules, unless otherwise agreed by the parties to the dispute; Clarify that legal issues that can be appealed by the Appellate Body do not include the meaning of domestic legislation; The Appellate Body shall only deal with issues necessary for the settlement of disputes; Introduce annual meetings between WTO members and the Appellate Body to discuss systemic issues or trends in jurisprudence in an open manner.

At the same time, the EU has put forward suggestions on how to strengthen the independence and impartiality of the Appellate Body and improve its efficiency. The measures include: providing a single long-term tenure of 6 to 8 years for the members of the Appellate Body, and increasing the number of full-time members from 7 to 9 to support the working capacity of the Appellate Body. These proposals also include rules to ensure that the selection process for members of the Appellate Body is automatically initiated when positions become vacant and that there is an orderly transition with outgoing members. The EU hopes that all WTO member states can quickly participate on this basis to avoid an imminent crisis.

The Appellate Body function of the WTO dispute settlement system is of great significance. Without this core function of the WTO, the world will lose a system that has been ensuring global trade stability for decades. The WTO dispute settlement system and its Appellate Body have always been the key to the security and predictability of the multilateral trading system. Without an appropriate enforcement system, multilateral rules cannot function effectively anymore. If there is no solution to the current deadlock in the appointment of the Appellate Body, the whole system will face risks. The United States and Japan have also jointly submitted proposals on notification and transparency rules within the WTO, demonstrating the good willingness of member countries to participate in promoting the reform process of all WTO functions.⁵

2.3 The EU Places Greater Emphasis on Bilateral Free Trade Agreements

The EU is an open economy and is currently negotiating bilateral, regional, and multilateral trade agreements with approximately 130 countries worldwide. It also plans to initiate talks on cooperation with other countries. The European Union is considered an important force in the world to promote the improvement of global standards in social, environmental, and human rights issues through the

⁵ A First Step to Revive the Rules-Based Trading System. <https://www.cgdev.org/sites/default/files/first-step-revive-rules-based-trading-system.pdf>

signing of free trade agreements. Therefore, the signing of these free trade agreements by the European Union is also considered the most suitable tool for promoting the trade vision, which will bring about global social, economic, and environmental progress for all. Due to the fact that the United States has already finalized several major bilateral free trade agreements in the Asia Pacific region, there are views that the EU needs to take swift action to ensure that it is not rejected by the most critical markets for future growth.⁶

According to the evaluation of the European Commission, the ongoing negotiations on a free trade agreement can increase the EU's GDP by over 2%, equivalent to 250 billion euros per year and the size of Denmark's economy each year. The driving force of this growth is mainly due to the intensification of economic competition and an increase in the pursuit of innovation. The process of innovation has accelerated, capital and R&D investment have increased, and technology diffusion has also increased. The higher trade flows brought about by free trade agreements not only promote growth, and then improve the living standards of European Union citizenship, but also the competition brought about by free trade agreements can significantly reduce commodity prices. Therefore, EU companies can invest more in research and development by improving production efficiency and reducing costs. In addition, free trade agreements can help break monopolies and bring about a decrease in consumer product prices, which will result in corresponding economic benefits of around 600 euros per year for ordinary EU consumers.

From the early 1990s to 2006, the European Union continued to implement free trade agreements in pursuit of multiple policy objectives and attempted to promote trade liberalization through the multilateral platform of the World Trade Organization. The main purpose of the EU Free Trade Agreement is not trade liberalization itself, nor the economic benefits of trade, but to achieve some political goals through trade and economic tools. For example, the EU not only provides preferential trade arrangements, but also attempts to export its systems and values. The new generation of free trade agreements of the European Union, in addition to disseminating the international trade and investment rules advocated by the EU, is to formulate more comprehensive, comprehensive, and forward-looking foreign trade policies, ensure that Europe remains open to the world and other markets, and make greater contributions to enhancing Europe's competitiveness.⁷

Since 2012, the European Union has been committed to developing new free trade agreements after shifting its trade policy towards envisioning more use of free trade agreements. The EU's primary task is to conclude a comprehensive multilateral agreement and achieve greater emphasis on bilateral free trade agreements, in line with its commitment to trade multilateralism. The EU free trade agreement has three broad commercial motivations, namely offsetting potential trade transfers caused by free trade agreements between third countries; Establishing strategic connections with rapidly growing countries or regions such as Latin America, India, and Asia; Strengthen the implementation of international trade rules such as intellectual property rights. The most comprehensive list of EU free trade agreements appeared in the December 2013 European Commission memorandum, which mentioned in its report that "trade agreements have been signed with approximately 50 partners".⁸

Through free trade agreement negotiations, the EU can also promote its regional integration model in other fields. Unlike the United States, the EU does not have a special free trade agreement "model" as the basis for negotiations with all partners. The EU usually only establishes its own free trade agreement model based on agreements reached between the United States and relevant countries. Regarding the content of free trade agreements, the EU seeks to implement duty-free trade for its 90% share of trade with preferential partners, although it accepts lower thresholds for developing countries. Exceptions in this regard include many agricultural, food, and pharmaceutical products. The EU has reserved safeguard measures in all its free trade agreements, such as the right to use Dumping (pricing policy)#Anti-dumping actions and implement import control in the case of "import surge".⁹

In February 2013, the European Union and the United States announced the launch of bilateral free trade agreement negotiations. Such an agreement will have a huge impact on bilateral and world trade, as it will cover one-third of world trade and half of global gross domestic product. In addition to the United States, free trade negotiations with developed economies such as Japan and Canada were also initiated in the context of the economic crisis. It has been proven that the crisis has accelerated the process of EU liberalization, and the debate on "free trade and protectionism" is much less than before, especially within the European Parliament. (Bollen, Ville, and Orbie, 2016) In 2016, after a long period of hesitation, the European Union began to significantly enhance its trade defense tools in order to better defend its own interests in an increasingly hostile global environment. (Koeth, 2022)

⁶ Overview of EU Trade Negotiations. <https://www.amfori.org/sites/default/files/Overview%20of%20FTAs%20-%20March%202022.pdf>

⁷ EU's New FTA Strategy: A Response to the Transformation of World Economy and Its Implications. http://www.globeco.ro/wp-content/uploads/vol/split/vol_5_no_1/geo_2017_vol5_no1_art_002.pdf

⁸ The eu free trade agreements. <https://platformlmpjsc.netlify.app/guiberteau21936si/the-eu-free-trade-agreements-tor.html>

⁹ European Union policy towards Free Trade Agreements. <https://www.euractiv.com/section/science-policy/making/opinion/european-union-policy-towards-free-trade-agreements/>

3. EU STRENGTHENS THE CONCEPT OF GREEN TRADE IN TRADE POLICIES

The EU is a major advocate and active promoter of green trade. In 2019, the European Commission launched the “European Green Agreement”.¹⁰ The EU believes that the primary goal of green trade policies is to ensure that trade achieves maximum human well-being with minimal energy and resource use. This requires redesigning the global trading system so that it does not disrupt the regeneration of ecosystems, while ensuring the possibility of high-quality employment and environmental protection both domestically and internationally. As the largest market in the world, the EU has both the Political power to take action and the economic interests to create a level playing field to integrate the negative social and environmental Externality of trade. The trade agreements signed by the European Union must set standards for higher social and environmental standards in global trade relations.

In May 2022, the European Commission issued the “Declaration on the Implementation of the European Green Agreement” at the World Economic Forum, emphasizing the new importance of further accelerating Europe’s green transformation and the necessity of strengthening the European innovation ecosystem in the process of green transformation. The European Green Agreement CEO Action Team, composed of over 50 CEOs, is a platform for business leaders and policymakers to accelerate green transformation. The European Green Agreement is an integral part of the strategy to implement the 2030 Agenda and the Sustainable Development Goals, aiming to transform the EU into a just and prosperous society, a modern, resource conserving and competitive economy, a society without net greenhouse gas emissions by 2050, and a society where economic growth is decoupled from resource use.

These goals include action areas such as climate change, economic inequality, innovation, sustainable consumption, peace and justice, as well as other priorities to eradicate poverty, protect the planet, and ensure peace and prosperity for all. The European Green Agreement is a road map to make the Economy of the European Union economy more sustainable. It aims to transform the Group of 27 into a Low-carbon economy through cleaner air and water, better health and a prosperous natural world, without reducing prosperity and improving people’s quality of life. By 2050, achieve the goal of achieving the entire net zero carbon emission block, and by 2030, reduce emissions by 50% -55% compared to 1990 levels, further stimulating positive global climate action.¹¹

¹⁰ The EU Green Deal – How will it impact my business? <https://www.cbi.eu/market-information/eu-green-deal-how-will-it-impact-my-business>

¹¹ EUROPEAN GREEN DEAL: A BRIEF SUMMARY. <https://sbsustainablebusiness.com/wp-content/uploads/2021/05/ebook-2-ing.pdf>

3.1 Maintain High Standards of Green Environmental Policies

The Paris Agreement and the 2030 Agenda for Sustainable Development must become reference points for all EU trade agreements. This means that trading partners can suspend the application of specific provisions in trade agreements that contradict these two treaties, unless the rules for resolving disputes under trade agreements are contrary to this. This requires incorporating substantive provisions into the dispute resolution chapter of the EU bilateral trade agreement.

The EU proposes to promote an initiative to regulate specific global supply chains in the WTO on the premise of the Paris Agreement and the 2030 Agenda. The World Trade Organization is at a crossroads. Further tariff liberalization is no longer a politically agreed issue and is not as important economically. On the other hand, WTO member countries are not yet ready to accept bold regulatory measures.

The EU promotes full alignment between its trade policies and its climate goals. The EU believes that trade should be a tool that serves climate policy. Therefore, the EU should adopt a bolder approach by distinguishing products based on carbon content in both internal markets and external relationships through its processes and production methods. These measures are crucial for maintaining high environmental standards within the EU as they help avoid shifting production to lower standards. This is also important for creating public support for ambitious climate goals. The EU promotes the declaration on “intellectual property rights and climate change” in the WTO, encourages technology transfer, and uses Compulsory license of key climate technologies when necessary.¹²

3.2 Develop Green and Renewable Energy

In 2021, global investment in low-carbon energy transformation reached \$755 billion, of which 11 were mainly concentrated in renewable energy, hydrogen, and nuclear energy. In addition to investment in energy transformation, approximately \$170 billion is spent on specific climate technologies for renewable energy. The European Commission recognizes that in an increasingly electrified world, the supply of ‘capable’ batteries is limited, and therefore faces increasing demand for batteries. In order to promote the transformation of clean energy and strengthen Europe’s competitiveness, it is crucial to establish a European battery ecosystem. By 2025 and 2030, the EU will meet 69% and 89% of its growing battery demand, respectively, and should be able to produce batteries for up to 11 million vehicles annually.

¹² GREEN TRADE FOR ALL. A Greens/EFA paper adopted on 12 June 2018. <https://www.greens-efa.eu/files/doc/docs/8d81764ba99463e222ad7f71e3a529a0.pdf>

To promote the development of renewable energy, government departments in EU countries will play a crucial role. This includes directing funds to riskier green projects, developing policies to support innovation, encouraging more environmentally friendly consumption, establishing regulatory frameworks to drive unsustainable projects towards more environmentally friendly ones, and so on. The European Commission believes that in the context of geopolitical development and rising energy prices, ensuring that innovation is accessible to everyone is crucial. When considering the future of European energy, efforts should be made to expand the potential for solar energy production and achieve energy diversification through partnership and national cooperation.

A green innovation worth strengthening is that it can allow individual households in EU countries, even those without hardware, to produce electricity on their own. The unfavorable situation is: firstly, the scope of tax incentives is limited. In most EU countries, value-added tax can be deducted when purchasing solar panels, but the person who “leases” the technology has no benefits, which hinders its wider application. The second is that there is a contract between the solar panels and the house. The cost of modifying the real estate legal contract to remove solar panels from the house is quite high. Thirdly, solar energy that has not been immediately consumed will return to the EU grid at a lower price and bring negative profits to producers. The fourth is the fragmentation of the entire European energy system. For example, Spain is second only to the Netherlands and Germany in solar power generation, but there are still challenges in exporting unconsumed energy.

3.3 Develop Green Precision Agriculture

In the new geopolitical context, the affordability of daily food in the European Union is severely affected by sudden price increases. In May 2022, the average price of a basket of food in Europe increased by 7.5%, the highest increase since the establishment of the eurozone. This price rise, which is of great significance to most families, is accompanied by the soaring Cost of living. In this case, the development of Precision agriculture can help prevent prices from soaring and reduce the overall carbon emissions of the agricultural sector.

Currently, ammonia is the main component of agricultural fertilizers, accounting for 70% of the total raw materials. However, the current fertilizer industry production has caused serious pollution due to the need to use natural gas. Clean ammonia is a new method pioneered internationally, aimed at using solar energy, wind energy, and hydropower to replace natural gas in the production of ammonia. As highlighted by the International Energy Agency, the shift to low-carbon

ammonia is likely to reduce the total carbon emissions of the industry by 70% in the “sustainable development scenario” by 2050, and by 95% at most in the “2050 net zero emission scenario”. However, like every new technology, if not produced on a large scale, this may result in a price premium for the final product.

Clean ammonia can not only be used to improve the agricultural sector, but also for the production of cleaning products and water treatment applications. If Precision agriculture is applied on a large scale, it will help to improve the overall utilization efficiency of plant nutrients, land, water and other resources. Especially for small farmers, sufficient incentive measures and capacity building are needed to prove the benefits of adopting Precision agriculture technology and using natural resources more consciously, and to constantly establish a virtuous circle of investment and innovation in Precision agriculture through a forward-looking regulatory framework. In order to deploy clean ammonia on a large scale in the entire fertilizer industry, it is necessary to strengthen cooperation between the private sector and the government.

Obstacles to the development of Precision agriculture include: First, all rural areas in the world lack broadband access, and problems in Europe are more limited. Although the penetration rate of smart phones and the Internet among farmers is high, ensuring uninterrupted/comprehensive Internet access in rural areas is crucial to encourage the widespread use of Precision agriculture tools. Secondly, the difficulty in obtaining credit hinders farmers from adopting more sustainable and innovative projects. Access to credit has become an important part of new technology deployment, because the cost of precision agricultural tools is a high barrier for small farmers who cannot pay a large number of Out-of-pocket expense fees.

3.4 Integrate Digital and Green Needs

G20 leaders recognize the importance of data in addressing climate change and have developed a comprehensive work plan specifically aimed at narrowing the data gap, ultimately helping businesses and governments make informed decisions on sustainable mitigation and adaptation.

Due to the company’s business model being built on existing information, cross data collaboration between industries has become more urgent. The supply chain is diverse with numerous participants, and data is crucial for fully understanding the carbon impact of business processes, as well as for developing a path forward.

Transparency is crucial for encouraging innovation and opening up new investment channels, which can bring greater benefits to the entire society. The wider application of “digital twins” in energy networks is emerging - in this case, gaps and problems can be identified in advance,

waste can be significantly reduced, and more broadly, carbon emissions in industrial processes can be reduced. Although the European single market undoubtedly brings great benefits to all member countries, there are still some major restrictions on scale innovation. Achieving cross-border data flow is not only crucial for knowledge transfer between economies, but also enables innovative cross-pollination between sectors or fields that may not be directly in contact.

At present, European enterprises operating globally are approaching sustainable development, but the dichotomy between business operation and sustainability often leads to limited operational action. In addition, another challenge currently faced by EU companies is the lack of transparency in emissions. Although emissions directly released by company operations are easy to track, emissions generated by indirect value chains become more difficult to track as they rely on data that requires input from various stakeholders throughout the entire supply chain. Policies that promote data sharing and interoperability, as well as broader understanding and adoption of related business innovations, can become important levers for improving energy efficiency, recyclability, and scope transparency.

The EU's data protection regulations may be seen as obstacles to sharing data. Currently, data protection has not promoted wider use and sharing of data among EU companies. The lack of data deficient has weakened the ability of these enterprises to make informed decisions about their carbon emissions and pursue sustainable business decisions. Companies with limited understanding of how to share data and its impact may believe that sharing data may endanger their competitive position. At the same time, from an external perspective, the European Union, the European Green Agreement, and the goals of the European Digital Decade will both affect its trade relations with major partners. Due to the EU's intention to position itself as a major participant in climate diplomacy, its relationship with major trading partners may be influenced by new principles. (World Economic Forum, 2023)

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