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Report on Green and Low-carbon Economy

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Supporting the Dual-Carbon Goals and Promoting Sustainable Development

2022 Social Impact Initiative Report on Green and Low-carbon Economy

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At the 75th session of the United Nations General Assembly in September 2020, General Secretary Xi Jinping announced that China would strive to peak CO₂ emissions before 2030, and achieve carbon neutrality before 2060. In October 2021, the CPC Central Committee and the State Council jointly issued the *Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy* and promised to release action plans for carbon dioxide peaking and a wide range of related support and safeguard measures for key fields and industries in succession, with a goal of implementing a "1+N" policy framework.

Enterprises have taken concrete steps to support the realization of China's carbon dioxide peaking and carbon neutrality goals. Multinational companies (MNCs), with their excellent scientific and technological R&D capabilities and advanced international experience, are considered critical to China's realization of the carbon dioxide peaking and carbon neutrality goals. The nationwide mission of the American Chamber of Commerce in China (AmCham China) is to help American companies succeed in China. We encourage and support member companies to innovate and upgrade, and realize sustainable growth by combining their business strategies and China's "dual carbon" goals.

This report will discuss China's "dual carbon" goals, including an overview of the policy framework, a status analysis, current policies and regulations, and others. Additionally, this report will systematically explore how MNCs support China's carbon dioxide peaking and neutrality goals by sharing case studies and proposing pragmatic recommendations for policy formulation and enterprise development.

Status Analysis

(i) Challenges and Growing Opportunities Facing Carbon Dioxide Peaking and Carbon Neutrality Goals

At the 75th session of the United Nations General Assembly in September 2020, General Secretary Xi Jinping announced that China would strive to peak CO₂ emissions before 2030 and achieve carbon neutrality before 2060. If successful, this means that China will pioneer a green industrial revolution, in which China will evolve from its traditional model of economic growth to a development model with a goal of achieving a sustainable economic system with low energy consumption, zero carbon emissions, and low pollution at the forefront. As such, China's carbon dioxide peaking and carbon neutrality goals are of paramount importance. In the next 10 to 40 years, China's economic policies will be inseparable from the core issue of reducing carbon emissions.

To achieve the aforementioned goals, China needs to overcome many challenges. Due to its large economy and significant demand for energy, China is both a major manufacturing power and the main emitter of carbon dioxide. According to the IEA data, China's carbon emissions in 2020 were as high as 10 billion tons, accounting for about 29% of global carbon emissions. However, as a developing country, China possesses an industrial structure dominated by heavy industry, an energy structure dominated by coal, and developing scientific, technological, and basic research capabilities. As a result, China is still in the "double-rising" stage, with data released by China's National Bureau of Statistics denoting that both energy consumption and carbon emissions increased by 69.7% and 47.2% respectively in 2019 compared with 2006. 85% of China's energy structure is dominated by high-carbon fossil fuel, of which coal accounts for 57%. In 2018, China's coal-driven carbon emissions accounted for 79.8% of the total energy carbon emissions. China has less than 40 years to reduce its current total carbon emissions of 10 billion tons to zero. In contrast, it is estimated that it would take the United States 43 years to reduce its carbon emissions from 6.1 billion tons to zero, and the European Union 60 years to reduce emissions from 4.5 billion tons to zero. Compared with other countries, China is facing a formidable task.

Nevertheless, the challenge of developing a green economy may present a new opportunity for China. First, although the development of clean energy is a requirement of China's zero emissions goals, it may also benefit China's growth. Second, developing a green economy is the key to creating industries that are environmentally friendly and

sustainable in the long-term in China, and in promoting economic sustainability globally. Finally, from a business perspective, developing a green economy also presents new opportunities for economic growth. *These new points of growth and opportunity include the transformation and upgrading of the traditional manufacturing industry, the digital transformation of enterprises, the creation of digital enterprises, the construction of Internet-supporting infrastructure, the research and development of green science and technology, and the reform of service industries. In the long run, embracing a sustainable economy has the potential to positively impact all aspects of life in China and abroad.*

Currently, one of the most fundamental paths towards realizing carbon neutrality is through energy transition. Carbon emissions caused by the use of fossil energy sources currently account for nearly 50% of China's total carbon emissions. Improving energy efficiency, reducing pollutant emissions, and increasing the utilization rate of production materials in key manufacturing industries with high carbon emissions are also considered effective ways to realize carbon neutrality. In addition, changing the daily lifestyles of individuals will be equally important for achieving carbon neutrality. Daily travel, domestic garbage disposal, and others, have led to a significant amount of carbon dioxide emissions. In light of this, promoting recycling, encouraging green commuting, and other changes to daily behaviors will be pivotal areas in the near future.

In addition to technological breakthroughs, the realization of the goals mentioned above will also involve systemic changes to institutions, policy, finance, industry, and daily life. Reforming the fiscal and financial system to create incentives for reducing carbon emission and promoting environmental protection would make relevant policies more sustainable. From a technology perspective, demand for low-, zero-, and negative-carbon technological innovation will continue to increase. From an industrial perspective, it will be necessary for businesses to include carbon emission into their calculation, thus reshaping corporate governance, strategy, investment decision-making, internal administrative control, and technological processes. From the perspective of the daily lives of individuals, reaching zero-carbon goals will require every member of society to buy-in and collectively adjust their lifestyle.

(ii) Present Policies

Given the continued emphasis on dual carbon goals by the Chinese government, China's system of low-carbon policy tools has rapidly improved. These improvements include the refinement of enforcement mechanisms at the national, regional, departmental, and industry levels. Laws, regulations, and monitoring agencies have also been strengthened, significantly enhancing the effectiveness of different policies¹.

Since the 11th Five-Year Plan, China has successively formulated and implemented a series of laws and regulations including the *Work Plan for Energy Conservation and Emission Reduction*, the *Work Plan for Energy Conservation and Emission Reduction during the 12th Five-Year Plan Period*, the *12th Five Year Plan for Energy Conservation and Emission Reduction*, and the *Work Plan for Energy Conservation and Emission Reduction during the 13th Five-Year Plan Period*. Additionally, two revisions to the *Energy Conservation Law of the People's Republic of China* (hereinafter referred to as the *Energy Conservation Law*) have been completed. In October 2007, the 30th session of the Standing Committee of the National People's Congress of the People's Republic of China deliberated and adopted the revised *Energy Conservation Law*, which further expanded the applicable scope of energy conservation laws (this expansion included guidance around transportation, buildings, public institutions, etc.), improved the energy conservation management system, and made more practical legal provisions for a series of energy conservation economic policies including financial subsidies, preferential taxes, credit support, etc., thus providing more powerful legal support for energy conservation. Additionally, revisions made to the *Energy Conservation Law* improved market regulation and the integration of the law with government administration, making the legal responsibilities of those in charge of energy conservation management clearer. As such, the 6th session of the Standing Committee of the National People's Congress of the People's Republic of China in October 2018 reviewed and passed the revised *Energy Conservation Law*.

In addition to being the first national plan to deal with climate change in China, the 2007 *National Climate Change Program* is also the first national plan to cope with climate change put forward by a developing country. This plan identified energy conservation and consumption reduction, improvement of energy structure, vigorous afforestation, and development of the circular economy as the main policy measures for low-carbon development. After the 2007 *National Climate Change Program*, China formulated a series of pragmatic planning schemes, including the *National Strategy for Climate Adaptation* (F.G.Q.H. [2013] No.2252), the *National Program on Climate Change (2014-2020)* (G.H. [2014] No.126), the *Work Plan for Controlling Greenhouse Gas Emissions during the 12th Five-Year Plan Period* (G.F. [2011] No.41), and the *Work Plan for Controlling Greenhouse Gas Emissions during the 13th Five-Year Plan Period* (G.F. [2016] No.61), thereby elevating its responses to climate change to a major national strategy and tackling the challenge of reducing the country's carbon emissions using several approaches, such as incorporating institutional mechanisms, building governance capacities, reforming taxation and financial support policies, facilitating technical support and international cooperation, and creating new organizations. Additionally, since 2008, *China's Policies and Actions to Address Climate Change* has been published on an annual basis to show the world China's overall strategy and progress in addressing climate change. Overall, China has made significant progress toward reducing its carbon emissions in a short time.

A total of 87 cities or provinces and regions were formally incorporated into three batches of low-carbon pilot projects by the National Development and Reform Commission (NDRC) in 2010, 2012 and 2017 respectively. This promoted the creation of strong, local low-carbon development systems and enforcement mechanisms. The pilot groups also created systems for internal program impact monitoring and assessment. In addition to this, the NDRC has also created a carbon emission trading pilot in numerous provinces and cities including Beijing, Tianjin, Shanghai, Chongqing, Guangdong, Hubei and Shenzhen. Since the "13th Five-Year Plan," a wide range of regions including Guangdong, Shenzhen, Jiangsu, Hainan, Beijing, Zhejiang, Shaanxi, Jiangsu, Hubei, Shanghai and Hunan have begun construction of near-zero carbon emission areas in order to begin applying low-carbon emissions technologies.

(iii) Analysis of Future Path

The "1+N" system proposed by the Chinese government specifically refers to the simultaneous creation of "N" local offshoots of "1" central principle. To explain further, the "1" in "1+N" refers to the core policy principles issued by the central government to promote carbon peaking and neutrality, while "N" refers to the specific plans made by each province and city in a sub-regional and sub-sectoral manner.

On January 24th, 2022, the Political Bureau of the CPC Central Committee organized a special study session to evaluate efforts to realize carbon dioxide peaking and carbon neutrality goals. During this assessment, President Xi Jinping stressed that the realization of carbon dioxide peaking and neutrality goals needed to deal with four pairs of relationships: a) the relationship between development and emission reduction, such that emission reduction efforts don't reduce productivity; b) the global-local relationship, such that carbon dioxide neutrality strategies are sensitive to the differing conditions of various areas and avoid "one-size-fits-all" solutions; c) the relationship between long-term goals and short-term goals, and; d) the relationship between the government and the market, such that the government can create incentives and penalties to compel businesses to work towards the carbon dioxide peaking and neutrality goals through greater market-government integration.

Presently, the primary policies issued by the central government include the *Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy*; the *Notice on the Carbon Peak Action Program by 2030*; the *Comprehensive Work Plan for Energy Conservation and Emission Reduction during the 14th Five-Year Plan Period* issued by the CPC Central Committee and the State Council; *Several Opinions on Strict Energy Efficiency Constraints to Promote Energy Con-*

servation and Carbon Reduction in Key Areas jointly issued by the NDRC, the Ministry of Industry and Information Technology, the Ministry of Ecology and Environment, the State Administration for Market Regulation and the National Energy Administration; the *Notice on Several Policies for Promoting the Steady Growth of the Industrial Economy* issued by the NDRC; and the *Notice on Accelerating the Comprehensive Utilization and Implementation Plan of Industrial Resources* jointly issued by eight departments represented by the Ministry of Industry and Information Technology.

The plan that China will use to realize "carbon dioxide peaking and carbon neutrality goals" in the near future is consistent with the plan it has historically followed to work towards the government's goal of carbon neutrality. Initiatives based on China's policies will center around the following dimensions: a) spurring an energy revolution by accelerating the development and reducing the production cost of renewable energy; b) reforming the manufacturing industry and other industries with high energy consumption and emissions; c) increasing the cost of fossil fuels to reduce the use of coal and petroleum, thus gradually implementing a carbon tax, and; d) building a green financial system to facilitate the use of credit to support the development of carbon emission reduction projects.

MNCs should pay close attention to the government's policy agenda and deeply engage with China's "carbon dioxide peaking and carbon neutrality" goals. As a representative of the business community and an important bridge to the government, AmCham China aims to serve as a platform for strengthening and expanding cooperation between government and enterprises.

II. International Trends

(i) International Commitments

Presently, a significant number of countries have formulated explicit long-term carbon emission reduction goals through international treaties on climate change. According to the United Nations Framework Convention on Climate Change (UNFCCC), 137 countries have made commitments related to carbon neutrality. This is evident that the goal of carbon neutrality is being adopted by UNFCCC member countries in an increasingly proactive manner.

Despite this, most countries have not developed specific policies or plans as to how to implement carbon neutrality commitments, and only a small number of countries have acted on their carbon reduction goals through domestic legislation. Among the countries that have created carbon reduction goals, execution plans differ significantly. The timeframes created for carbon neutrality goals can be divided into three categories: "before 2050," "in 2050," and "before 2100"². Developed countries in Europe (such as EU member states) have generally decided to reach carbon neutral goals in 2050. Countries like Japan, Britain, Canada, and South Korea have also made political commitments to achieve carbon neutrality by 2050. Although Japan's original goal was to reduce carbon emissions by 80% by 2050, the country has since shifted to achieving carbon neutrality in 2050. Britain proposed to achieve zero carbon emissions in 2045 and carbon neutrality in 2050. The Canadian government has also explicitly proposed to achieve carbon neutrality by 2050. Finland and Iceland are also included in the "before 2050" group, with each aiming to achieve carbon neutrality between 2035 and 2040. Many other countries have set up goals to achieve carbon neutrality in the second half of the 21st century. However, different countries have differing definitions of "carbon neutrality". For example, some countries only aim at zero carbon dioxide emissions, while most countries equate "carbon" with greenhouse gas emissions and have made more aggressive carbon neutrality commitments.

Presently, the EU has actively worked to promote the realization of carbon neutrality. On September 16, 2020, Ursula von der Leyen, Chairman of the Commission of European Union, published the *State of the Union Address*, announcing the EU's goal of carbon emission reduction. This goal states that the EU's greenhouse gas emissions in 2030 will be reduced by at least 55% compared with 1990, making Europe the first continent in the world to achieve carbon neutrality by 2050. The EU has continuously reduced carbon emissions since 1990, with a cumulative reduction of 23.3%³. The EU integrated this

goal in its legislation by finalizing a draft of the *European Climate Law* in March 2020. The EU has also vigorously promoted the use of low-carbon technologies, improved its carbon trading market, and took the lead in establishing a carbon tariff system and a carbon tax on imported products. Additionally, the EU increased investment in green industries and public expenditure for sustainable development. For instance, in July 2020, the EU reached a consensus on a 500 billion USD economic stimulus policy, of which 30% was utilized to support climate action and the implementation of the *European Green Deal*⁴.

(ii) Policies on Reducing Carbon Emissions

In light of current international trends, the reduction of carbon emissions has evolved into an integral aspect of future development. Nonetheless, due to the contradiction between the reduction of carbon emissions and the current development, only a few developed countries are capable of veritably publishing specific policy plans and taking practical actions.

United States President Joe Biden signed an executive order on January 27, 2021, that included a suite of measures aimed at effectively coping with climate change. On the premise of putting the climate crisis at the center of American foreign policy and national security, the executive order furthered a wide range of policy objectives, including the creation of a goal to achieve zero carbon pollution from the energy sector by 2035, zero carbon emissions from government vehicles at federal and state levels, progressively eliminating fossil fuel subsidies, and more.

The EU's *European Green Deal* formulated a path towards carbon neutrality that highlighted seven key areas, including energy, industry, construction, transportation, food supplies, ecology, and the environment. It featured a variety of initiatives such as developing renewable energy to the maximum extent possible in member states; maximizing the energy efficiency of businesses; encouraging the recycling and multi-level cyclic utilization of electronic products, textiles and plastic products; supporting green modes of travel; and making full use of carbon capture technology. The EU pledged 40 billion EUR to compensate businesses in member states that would be negatively impacted by the changes outlined in the *European Green Deal*. Germany attached great importance to the development of renewable energy technology, transitioning to renewable power sources in numerous sectors such as transportation, heating, and manufacturing. Germany set a goal that renewable energy would account for 65% and 80% of its total power generation by 2030 and 2050 respectively. Germany's government also set a goal for renewable energy consumption to account for 30% of its terminal energy

consumption in 2030 and 60% of its terminal energy consumption in 2050. France, another industrial power in the EU, is planning to invest a total of 7 billion EUR by 2030 to develop carbon-free hydrogen energy to promote decarbonization in manufacturing, transportation, and other sectors.

In January 2020, the Japanese government published the *Renovation of Environmental Technology Innovation Strategies* to promote Japan's energy transformation. This memo introduced five innovative measures, including the construction of a zero-carbon power supply system with non-fossil energy technology; the construction of a "smart energy" system based on digital innovation; the creation of innovative hydrogen energy technology; the creation of a carbon recycling system with carbon capture, utilization and storage (CCUS) technology; and the construction of a natural ecological balance maintenance system with zero-carbon technology in agriculture, forestry and aquaculture as the focus. The Japanese government also announced the "Green Growth Plan", which proposed decarbonization in the power sector as the main measure of realizing carbon neutrality and a renewed focus on the development of offshore wind turbines.

Based on the experiences of different countries, countries usually focus on the following two aspects to reduce carbon emission: a) developing carbon emission reduction and sequestering technologies to improve energy efficiency, abate emissions and reduce the cost of renewable energy, and; b) developing a low-carbon circular economy.

AmCham China and its member companies could share international experiences and technical expertise. In addition to facilitating strong collaborative relationships between member companies, AmCham is committed to promoting international co-operation and strengthening exchanges between the public sector and private sector. AmCham China also encourages its member companies to accelerate the research and development of green technologies and help expand the market to promote and apply such technologies.

Recommendations

The realization of the goal of carbon neutrality will set off profound and systematic changes, in the society promoting with the emergence of new technologies, industries, transportation methods, smart buildings, new energy sources, and sustainable development models. The core problem that China needs to solve is the relationship between reducing carbon emission reduction and economic development. Solving the problem of carbon emission without hampering development will depend on the active participation and close cooperation of the government, private sector, and the rest of society. AmCham China will encourage the government to provide businesses with more guidance to help realize the country's dual carbon goals. In addition to this, AmCham China also encourages businesses to pursue their own green transformations. By building effective communication channels between the government and businesses, AmCham China will promote active participation and close cooperation with stakeholders to help China achieve the dual carbon goals.

(i) More Clarity in Public Policies and Regulations

- (1) AmCham China recommends that the Chinese government further clarifies the guiding principles and action plans of “dual carbon” policies especially on the local level. Specifically, the government could further mobilize the implementation by setting the total carbon emissions targets at the national level, and control the phased targets to clarify the responsibilities of regions and industries. The government could also sign the corresponding *Responsibility Letter of Peak Carbon Dioxide Emissions and Carbon Emission Reduction Targets* with the provinces (autonomous regions and municipalities directly under the central government) and key central enterprises and make great efforts to process management and assessment on the premise of clear objectives and tasks. This will improve overall coordination at the national level, thus providing expectations for production planning and development of enterprises. Currently, the specific documents issued by various departments represented by NDRC and the Ministry of Industry and Information Technology make it clear that renewable energy is no longer incorporated into the calculation of energy consumption, and that the verification of carbon emission indicators needs a certain degree of flexibility, to ensure a stable environment for enterprises' production and industrial supply chain. AmCham China encourages more specific guidance like this.

AmCham China members also expect the government to further clarify the role of the private sector in the process of policy planning and execution. Climate change presents both challenges and opportunities to businesses in all industries. However, despite ongoing dialogues between US and China at the central government level, the private sector has not had the opportunity to engage with relevant stakeholders on this issue. The private sector would like to be part of more conversations to better identify opportunities for collaboration and carry out strategic planning.

- (2) It is strongly recommended that the government leverage more public-private partnerships to encourage the development and application of cutting-edge technologies focusing on the development of CCUS technology, strengthening the R&D and demonstration of advanced technologies (e.g., energy storage and smart grids), accelerating the deployment of new energy passenger vehicles and hydrogen fuel cell vehicles, and studying the carbon emission reduction technology of non-CO₂ greenhouse gases in key areas/industries to form a full-caliber greenhouse gas control technology scheme. The use of H₂ for fuel switching at industrial operations should be facilitated and incentivized. Therefore, the government needs to communicate more with enterprises in terms of technology development, and deployment understand the difficulties encountered by enterprises when engaged in R&D and deployment, and endow them with more targeted support.
- (3) The government could issue relevant fiscal and monetary policies. There is no public fund income directly related to clean energy except the national revenue of the clean development mechanism (CDM) projects and the additional electricity consumption of renewable energy. In the near future, the government can consider continuously improving the investment and financing system related to carbon emission reduction and increasing the sources of funds and local financial input, so as to promote the realization of the local government's investment in carbon dioxide peaking and carbon neutrality goals. Meanwhile, the government could also use tax incentives to enterprises which are developing and deploying low/no carbon solutions, to provide reasonable compensation and incentives for their green contribution, so as to promote enterprises to accelerate the upgrading of green equipment and complete the transformation of green production. There is no contradiction between the increase of the government's green income and the reduction of the enterprise's green cost. On the contrary, they are essentially complementary. Therefore, it is necessary for the government to realize the balanced development among regions, industries, and enterprises (large, small, and medium-sized) by means of financial adjustment.
- (4) The government could vigorously strengthen international cooperation, proactively

promote the construction of a new global climate governance system, and further promote the effective implementation of various international cooperation projects with the help of international platforms of MNCs. For instance, by the end of 2021, the Silk Road Maritime platform, which has been in operation since December 2018, had more than 200 alliance members, covering areas from Asia and Africa to Europe, the Americas, and Oceania, and reaching 58 ports in 27 countries around the world. Through the further promotion of international cooperation among various logistics enterprises, the Silk Road Maritime platform promotes the collection of numerous industrial elements including logistics resources, business information, and financial capital; realizes efficient connection among transportation modes; and flexibly connects various transportation modes digitally to maximize logistical efficiency, thereby significantly reducing carbon emissions during logistical processes and transportation.

Chinese and American companies should collaborate more on the energy transformation. Because of the influence of strained bilateral relations, many cooperative programs and technical exchanges have been suspended. AmCham China expects that if the US and Chinese government can express support for high-quality cooperative projects, it will encourage cooperation, innovation, and technological breakthroughs from the private sector. This will better enable China to achieve its dual carbon goals and carbon reduction commitments.

- (5) The government should avoid the introduction of "one-size-fits-all" solutions and extreme carbon emission reduction initiatives. Basic economic and environmental conditions in other regions are quite distinct from the same conditions in China; therefore, in implementing the policies issued by the central government, local governments should try their best to avoid introducing radical carbon emission reduction initiatives that are not aligned with the actual situation for the early realization of the carbon dioxide peaking and carbon neutrality goals. Nor can they drastically reduce the output and consumption of fossil energy such as coal, oil and gas by benchmarking against other countries' and regions' carbon emission reduction strategies, which may be unreasonable, potentially leading to an energy shortage caused by excessive energy transformation and insufficient investment in fossil energy. This would damage the sustainable development of the economy.

- (6) The electricity system in China has not traditionally been a fully transparent market. Generators injected their energy in the network at pre-fixed tariffs and the dispatcher (state grid) managed the system. There is no allocation/attribution system for users to identify what percentage of their consumption is generated by renewable sources. The first Power Purchasing Agreements were regulated in December 2021, but the volume of renewable energy available for trading is small at this stage. There is also a limited market for the acquisition of certificates of use of renewable energy. AmCham China recommends that the regulators develop all the above, to allow users to acquire certified no-emission electricity to power their facilities.

(ii) Enterprises to Formulate Green Development Plans

Enterprises should pursue sustainable development strategies, increase the utilization rate of renewable energy and reduce carbon emissions in all parts of commercial activities. This will also further push enterprises to improve management capability and technology. In general, it is highly recommended that enterprises consider and develop low-carbon work from the following principles.

- (1) Enterprises should make clear their market positioning as it relates to carbon dioxide peaking and carbon neutrality and then make corresponding diversified adjustments involving organizational structure, business, products, and others.
- (2) The sustainable development strategy and carbon neutrality goal require enterprises to effectively balance the opportunities and threats related to carbon neutrality. For enterprises in the field of new energy, carbon neutrality obviously brings important development opportunities and further enhances the competitiveness of their market segments. In contrast, companies whose profits are negatively affected by carbon emission reduction can consider taking proactive actions in stock-based business, with focus on energy saving, emission reduction, cost reduction and efficiency increase, carbon capture and carbon trading. At the same time, enterprises should also accelerate business transformation through more deployment in the field of sustainable development and new energy.
- (3) Information technology is a necessary tool for the sustainable development of enterprises and achieving carbon neutrality. Enterprise carbon footprint tracking and carbon asset management are characterized by the application of information technology. Similarly, cost reduction and increased enterprise efficiency largely depend on the level of digitalization and intelligence. Integrating the

reduction of carbon emissions into existing information systems and business processes, information disclosure oriented by supervision, and connection with the carbon trading market are necessary to effectively introduce information technology infrastructure.

(iii) Key Enterprises to Speed up the Process of Transformation and Upgrading

Because traditional energy enterprises and high energy-consuming chemical enterprises are most affected by carbon dioxide peaking and carbon neutrality, they need to respond constructively to these two policies by vigorously optimizing and adjusting the enterprise structure while paying attention to the low-carbon transformation of enterprises, leading the technological revolution, and adjusting the development strategy of enterprises. Only then will they achieve enterprise transformation smoothly as soon as possible in accordance with various national requirements, principles, and policies.

It is strongly recommend that traditional energy enterprises make positive changes according to the following principles. First, they can change from the provisions of products to services, and then from the provisions of single services to comprehensive services, so as to tap the client-side energy demands, optimize internal management and improve operating efficiency, thereby exploring the transition path to comprehensive energy service providers. Second, they can increase their R&D investment in low-carbon technology. For example, they should not only improve the sustainable development and low-carbon competitiveness of oil and gas enterprises through scientific and technological innovation, but also increase the R&D investment and promotion of low-carbon products and core technologies. Third, they should vigorously develop clean energy and new technologies characterized by energy saving, low carbon, environmental protection, carbon emission reduction and consumption reduction. They should also continuously reduce the energy consumption per unit product, the number of fossil fuels burned directly and the carbon intensity of the products sold. Fourth, they should promote the digital management of transformation and achieve systematic energy saving and consumption reduction as well as systematically understand a wide range of factors including energy consumption, energy cost, and so on, through data management, so as to reduce the energy utilization rate of enterprises and increase the profit of enterprises⁵.

We also recommended that high energy-consuming chemical enterprises actively improve the process technology level and management control measures to continuously promote energy reduction and carbon emission reduction. They should also reduce the

costs of carbon emissions, thereby significantly improving the overall core competitive advantage of enterprises, the speed and efficiency of enterprise transformation and upgrading. Meanwhile, enterprises can also launch greener products launch. This will increase the added value of products throughout the supply chain, so as to enable enterprises to obtain the power of long-term sustainable development. During the process of realizing carbon dioxide peaking and carbon neutrality goals, the demand for energy-saving and thermal insulation materials in the construction sector will increase, as will the demand for hydrogen fuel cells and power battery diaphragm materials in the transportation sector. Similarly, the field of new chemical materials will also experience growth. Consequently, enterprises should combine their own advantages to fully study the market demand in the context of carbon dioxide peaking and carbon neutrality, and effectively enhance their market competitive advantage through innovation and green development⁶.

(iv) MNCs to Seize Growth Opportunities

The green and low-carbon economy is the trend of world economy. Governments all over the world have launched policies to incentive the reduction of carbon emission. Post-pandemic green recovery has also become a global consensus. Against this backdrop, consumers' mentality has correspondingly changed significantly, and more mature markets are willing to consume green products. MNCs' practice of low-carbon strategy is not only fulfilling social responsibility goals but also allowing them to explore new markets to meet market demands. MNCs should make full use of its diversified advantages, including supply chain, business deployment, technological R&D capability and global vision, to seize the development opportunity of low-carbon transformation in the Chinese market.

First, MNCs should accelerate the process of energy transformation. China's carbon market has just started, and the operating model of the carbon market is based on the relative emissions of market players. In view of this, MNCs should make effective use of capital and technological advantages to speed up the upgrading of energy conservation and consumption reduction of industries in China and improve the energy efficiency by improving the digital management level of enterprises. In addition, while reducing the energy cost, MNCs can also generate further venue by trading the existing carbon emissions in the carbon market.

Second, MNCs should proactively deploy with a sustainability value proposition, and create low-emission, low-pollution and recyclable products by introducing international advanced production technology. Meanwhile, MNCs should also promote the appli-

cation of emerging products, including promoting the standard formulation of specific domestic industries, raw material control, pesticide utilization, carbon emission requirements of the product production process, specific requirements of product packaging, etc., thereby leading the development of the green market.

Finally, MNCs should focus on cultivating consumer demand for environmentally friendly products. Presently, there is still room for improvement with regard to Chinese consumers' awareness of the concept of green consumption. Compared those in the United States and Europe, there's great potential for consumers in China to recognize the value of paying extra for low-carbon, environmentally friendly products. MNCs should make full use of social media in market cultivation and community building to tap the potential of China's green consumer groups, with a view to laying a solid foundation for the subsequent promotion of their environmentally friendly products.

[Endnotes]

1. Zhang Youguo. Situation and Opening Thinking of Carbon Peak and Carbon Neutrality Work. doi: 10.3969/J. ISSN.1674-7453.2021.03.009
2. Zhang Yaxin., Luo Huilin., and Wang Can. International Trend Analysis of Carbon Neutrality Action [J]. Research Progress of Climate Change, 2021,17 (1): 88-97. doi: 10.12006/J. ISSN.1673-1719.2020.241
3. BP, Statistical Review of World Energy, June 2020, 2020[2020-10-14].https://ec.europa.eu/clima/policies/budget/mainstreaming_en
4. European Commission. Supporting climate action through the EU budge.https://ec.europa.eu/clima/policies/budget/mainstreaming_en
5. Lu Yu., Ying Ting., Hua Ting., & Li Wenxiang. Research on the Transformation Path of Energy Enterprises under the Goal of Carbon Neutrality. doi: 10.3969/J. ISSN.1004-4914.2021.12.017.
6. Liang Yanrong. Suggestions for the Development and Transformation of High Energy Consumption Chemical Enterprises under the Carbon Neutrality Background. doi: 10.12315/j.issn.1673-8160.2021.33.022

List of Case Studies by AmCham China Members

Innovating and Promoting Green Technologies

- GE: Technological Innovation Catalyzes Green Transition in Power Industry
- ExxonMobil: Large-Scale Carbon Capture and Storage (CCS) Concept of Houston Hub in U.S
- HPE Prioritizes Sustainability to Accelerate Green Economy
- Microsoft : "AI for Earth"
- IBM: Underpinning the Upgrading of Urban Smart Pipeline Network
- Donaldson: Solving Filtration Problems For Clearer Air

Establishing Green Supply Chain

- Amazon: Driving Cross-Sector Carbon Collaboration
- Dell Technologies: Closed-Loop Recycling Plastics Supply Chain
- Qualcomm: 5G as a Catalyst for Lower Carbon Emissions and Green and Sustainable Development
- Danone: One Planet Initiative to Contribute to a "Beautiful China"

Facilitating Green Transformation at the Industrial Level

- UPS: Delivers What Matters for the World – A Sustainable Future for All
- Understanding Green Skills via LinkedIn Economic Graph
- IHG: A Comprehensive Approach to Carbon Reduction
- Syngenta Group China: Climate-Smart Agriculture Safeguards Agricultural Production from Climate Extremes
- Elix Water: Industry Leaders in Carbon-Friendly Packaged Water
- Cotton Council International: USCTP's Contributions to Sustainable Cotton Production
- Ballistic Architecture Machine: Normalizing the Idea of Locating Waste-related Infrastructure Within Urban Center



GE: Technological Innovation Catalyzes Green Transition in Power Industry


Research reveals that global warming is gradually speeding up. By 2050, global energy demand will rise by 25 percent and could reach nearly 60 percent if GHG emissions are not reduced. According to the International Energy Agency (IEA), total CO₂ emissions in China were approximately 1 billion tons in 2020, more than 1/4 of the global aggregate, making China the largest global emitter. Among the sources of CO₂ emissions, power, and heating industries accounted for 51 percent, well ahead of other industries. Therefore, the green and low-carbon transitions in the power industry is critical to China's sustainable development. During the 14th Five-Year Plan period (2021-2025), China will build a new type of power structure with renewables as the foundation. However, achieving this target is challenging in terms of renewable energy technologies and the accessibility and stability of clean energy. It is imperative for China's energy industry to balance carbon emission targets and economic growth by innovating energy technologies.

Working towards clean, low-carbon, and efficient energy sources has become a trend throughout the world. GE's operations covering three industries – energy, aviation, and healthcare - all need to boost its energy utilization rate and reduce carbon emission by consistent investment in R&D and industry solutions to build a low-carbon future. GE is committed to solving the energy “trilemma” accessibility, reliability, and sustainability. In 2020, GE invested over USD 1.5 billion in R&D across Power, Renewable, and Aviation sectors to develop innovative products that improve efficiency and reduce emissions.

1. GE Gas Power Solutions Support a Flexible, Stable and Highly Efficient Power System

Combining globally advanced technologies and localized industry chains, GE is supporting large urban areas in China in pursuit of stability in the energy transition and cost-effectiveness in energy consumption. While renewable energy has been widely promoted and recognized, to deployed low-carbon, stable, reliable, cost-effective, and land-conserving natural gas power plants is believed to be a force multiplier to help accelerate decarbonization, maintain grid stability, reduce carbon emissions, and raise energy utilization rates.

GE's HA gas turbine enjoys special advantages in generating and supplying electricity to Chinese urban areas thanks to its outstanding efficiency and reliability. The HA gas turbine excels specifically in condensing power generation and allowing units to com-




GE: Technological Innovation Catalyzes Green Transition in Power Industry

plement renewable sources in metropolitan clusters. In metropolitan clusters such as the Greater Bay Area (GBA) where both power consumption and land prices are high, the 9HA gas power plant is more suitable in terms of cost-effectiveness as it occupies a smaller land area and can save up to 14,000 m² of land. In addition, efficiency in power generation, large output, and start-stop flexibility make the 9HA gas turbine a perfect choice in areas that are promoting renewables as a primary power source and supplements to renewables to maintain grid stability.

GE believes that the development of renewable energy underpinned by gas power and the ongoing Coal-to-Gas transformation, are the most effective way to cut carbon emissions in a short term. For example, Northern China is the primary area in which the replacement of coal by gas has been rolled out. In January 2021, the first 9HA.01 power plant in China was formally commissioned in China Huadian Tianjin Junliangcheng Power Plant. This project is now running stably, and its efficiency far exceeds expectations. With a combined cycle rate as high as 63.36%, it is the most efficient HA class gas power plant commissioned in China. In calculations based on 4,500 hours of operation throughout a year, the 9HA turbine unit consumes around 196g/KWH coal for general power generation under conditions of full-load work in summer. This consumes approximately 100g/KWH less coal in comparison to 600MW ultra supercritical coal-burning units under the same working conditions. It saves more than 300,000 tons of standard coal annually and reduces CO₂ emission by 1.8 million tons per year, equivalent to eliminating exhaust gas emissions from 1.7 million sedans per year. Additionally, it also cuts down the annual emission of SO₂ by 1,194 tons and NO_x by 7,755 tons. As a result, this power plant was selected as POWER Magazine's 2021 Reinvention Award winner (Coal-to-Gas Transition). In 2022, three sets of 9HA.02 turbines will be commissioned in Ningzhou power plant in Dongguan, which will play a positive role in conserving energy, reducing emissions, and upgrading industries in GBA.

Developing hydrogen technology has become one of the most important paths for countries to realize carbon emission targets. Hydrogen, a cleaner energy carrier, plays multiple roles in low-carbon energy transition. Hydropower serves as a cost-effective, low-carbon heating source based on existing infrastructure in areas already covered by natural gas networks; assists CHP facilities in producing heat and power for industry purposes; and furthers emissions reduction, creating greener and more environmentally friendly results than ordinary gas power plants. To explore the prospects of applying hydrogen and other new fuels in power generation, GE has made successful



GE: Technological Innovation Catalyzes Green Transition in Power Industry

technological breakthroughs by burning a mixture with 50% hydrogen in HA turbine. GE estimates that before 2030, the HA gas turbine could raise its capacity to burn 100% hydrogen or use 100% hydrogen to generate power with zero-emissions.

In December 2021, GE announced that a general energy station in Huizhou GBA Petrochemical Area under Guangdong Energy Group officially placed orders of two combined cycle units of 9HA.01 heavy gas turbines from GE and its partner Harbin Electric Corporation. After this project is commissioned, the two sets of turbines will use 10% (volume) hydrogen mixed with natural gas for burning. The project will become the first dual-fuel power plant using both natural gas and hydrogen in China. It will likely be formally commissioned for commercial purposes in 2023 and add 1.34 gigawatts to the grid. The turbines support Guangdong Province in enhancing international cooperation and building a low-carbon, inclusive, and sustainable urban area. The unit will be manufactured by GE's local JV formed with Harbin Electric, signaling a key step for 9HA gas turbines' localization in China.

In 2017, GE and Harbin Electric Corporation signed an agreement on a JV project of heavy gas turbines and established a JV in Qinhuangdao in 2018 to localize the value chain. This includes technological R&D, manufacturing, and services to provide local clients with timely, cost-effective, and market-oriented technical support and services. The initiatives also hope to help Chinese power generators realize their targets of carbon emission reduction. The JV project's first phase begins with basic production processes such as assembly of the turbines. In its second phase, it will localize the production of the turbine's heat work components for casting, mechanical processing, and special processes, which have higher requirements for production techniques. The gradual increase in GE's investment in turbine manufacturing in China reflects China's transformation from a low-cost manufacturing center to an important emerging market. As GE's only core base to manufacture heavy turbines in Asia, this JV will provide gas turbine power plants in China with highly-efficient and reliable power generation solutions driven by natural gas and hydrogen.

II. GE Renewable Energy Solutions Contribute to the Clean and Low-carbon Transition in the Power System


Large-scale utilization of renewables and clean development of conventional energy sources will become the underlying trend for energy development. Wind power has



GE: Technological Innovation Catalyzes Green Transition in Power Industry

taken over 7% of China's total installed capacity, following coal and hydropower and becoming the third most utilized power source. Offshore wind power has become a new driving force for the development of wind power industry. GE identified this as a key focus area in China's energy transition.

In 2019, GE signed an agreement with Guangdong Province on investment in offshore wind power projects, out of which an eco-sphere of regional offshore wind power rooted in Guangdong but expanding into the Asia-Pacific Region would be built. According to this agreement, GE has established a new offshore wind factory at Jieyang's Offshore Wind cluster in Guangdong province to produce GE's cutting-edge offshore wind technology of Haliade-X, the world's most powerful offshore wind turbine, and has established a new Operation and Development Center in the city of Guangzhou. The manufacturing site in Jieyang and the operation and development center in Guangzhou indicates that GE not only introduces globally-advanced wind power technologies and equipment to upgrade local industrial chain and supply chain; but also considers the product that is suitable for China's maritime characteristics. GE's offshore wind power operation and development center located in the Development Zone of Guangzhou has been commissioned and its general assembly base for offshore wind power unit located in Jieyang began operations in August 2021. The first unit module will be taken off-line in early 2022 and delivered to the Dogger Bank offshore wind power project in the U.K. In the future, the manufactured and assembled offshore wind power unit will have its maximum electricity generation reach up to 14 megawatts. Every set of wind turbines will produce 67 million KWH to support 16,000 European households while reducing CO₂ emissions by 42 million tons, equivalent to the emissions from 9,000 vehicles in one year. This is 40% higher than the electricity generated by the commissioned wind turbine with the largest power in the world to date. Moreover, GE's turbine blades are made of carbon and glass fiber composites, resistant to erosion in a maritime environment. This prolongs the maintenance and service cycle. As the unit withstands extreme wind speed of over 70m/s, it was awarded the typhoon-level certificate issued by an authoritative industrial organization in 2021. This proves that this type of wind turbine is suitable to be installed in maritime areas plagued by more typhoons and uneven distribution of wind speeds throughout the year; for example, coastal areas of Guangdong Province. In December 2019, Haliade-X was rated by Times as the Best Sustainability Invention of the Year.




GE: Technological Innovation Catalyzes Green Transition in Power Industry

GE has contributed to key engineering projects in hydropower sector in China for the past 20 years, including many large-scale water conservancy projects including Three-Gorges Dam, Xiangjia Dam, and Wudongde Project commissioned in 2021. Apart from providing water conservancy projects with equipment, it is also making efforts to stabilize grids in regions where wind and solar power as well as other new energy sources are applied. GE stabilizes grids with pumped energy storage technology that boasts flexibility in power supply and transmission as well as energy storage. This technology is likened to a power bank that pumps water to drive hydro-generators to generate electricity and temporarily adjust the load. In recent years, GE developed a pumping storage unit at variable speed to more efficiently utilize limited waterpower resources. This type of unit has been commissioned in many countries, including Switzerland and India.

In the past decade, GE's power generation equipment witnessed its carbon intensity cut down by nearly 20% thanks to constant innovation and technological promotion in gas power and renewable energy. Introducing the most fitting energy solutions is GE's commitment to the China market. Constant breakthroughs in energy technologies like fuel gas and offshore wind power highlight GE's efforts in innovating its approaches to carbon-neutral operations and zero-emissions. In the future, GE will further support China's carbon peak and carbon neutrality by exploring the green and low-carbon transition with its capacity to combine globally advanced energy solutions with localized energy industry chains.

About GE China:

GE started doing business in China as early as 1906, and was considered one of the most energetic foreign companies in the country at that time. GE resumed trade with China and opened its Beijing office in 1979 at the onset of the country's reform and opening-up. Since China's Reform and Opening up, GE has participated in multiple key projects that have driven China's economic and social development, including the Three Gorges Project, the West-East Natural Gas Transmission Project, the Beijing Olympics, the Blue Sky Protection Campaign, the C919 large passenger aircraft project, and the "Belt and Road" Initiative. China is an important strategic market for GE and GE's largest single country market outside the US. All of GE's vertical businesses have a significant presence in the market, including energy, aviation, and healthcare, as well as hor-



GE: Technological Innovation Catalyzes Green Transition in Power Industry

horizontal business units including financing, advanced manufacturing, R&D, and digital. Looking to the future, GE's development in China is an important driver of GE's future global growth. Under the guidance of China's "new development" concept, GE is seizing opportunities presented by the nation's green development, urbanization, Health China 2030 and digital economy. GE is focusing on the development of the energy, aviation, and healthcare sectors, while pursuing the three strategies of "Comprehensive Localization, Global Partnership, and Culture Transformation and Lean Management" to grow together with our Chinese partners and to support China's economic transformation and upgrading.



ExxonMobil: Large-scale Carbon Capture and Storage (CCS) Concept of Houston Hub in U.S.

I. Summary of Challenges Faced

Underpinning future energy demand is economic growth driven by increasing population and growing prosperity. The continuing demand for our products is concentrated in: power generation, industrial, and commercial transportation. These industries are essential for modern life. They produce electricity to power homes and workplaces. They provide fuels and lubricants for transportation, cement and steel for construction, and the building blocks for a variety of important products, ranging from medical supplies to food packaging.

These industries also produce CO₂, accounting for nearly two-thirds of the world's energy-related CO₂ emissions. There is still a lack of lower-emission alternatives to adequately meet the many needs in these sectors.

Few challenges are more important than meeting the world's growing demand for energy and products that support modern life, while reducing environmental impacts, including the risks of climate change.

II. Solutions Implemented by ExxonMobil

ExxonMobil has committed \$15 billion for lower-emission investments through 2027. These investments will include a balance between projects to reduce greenhouse gas emissions from existing operations and increased investments in the Low Carbon Solutions business.

At year-end 2020, ExxonMobil exceeded the emission reduction goals outlined in 2018. In addition, ExxonMobil is on track to exceed its 2025 greenhouse gas emission-reduction plans announced in December 2020. The company anticipates year-end 2021 results to show a reduction of 15-20% in greenhouse gas intensity from upstream operations compared to 2016 levels, four years ahead of schedule. This is supported by an anticipated reduction of 40-50% in methane intensity and 35-45% in flaring intensity compared to 2016.

Furthermore, ExxonMobil has developed more aggressive plans for further Scope 1 and Scope 2 reductions through 2030, consistent with Paris Agreement pathways. The 2030 Greenhouse Gas Emission-Reduction Plans includes:

- 20-30% reduction in corporate-wide intensity

A bold plan to capture and store CO₂

When it comes to helping the U.S. meet its emissions-reduction goals, ExxonMobil is thinking big. That's why the company is investing in a new capture and storage technology that could capture 10% of the nation's CO₂ emissions by 2040. The Channel One oil and natural gas processing corridor, has the potential to capture effectively



ExxonMobil: Large-scale Carbon Capture and Storage (CCS) Concept of Houston Hub in U.S.

- 40-50% reduction in Upstream intensity
- 70-80% reduction in corporate-wide methane intensity
- 60-70% reduction in corporate-wide flaring intensity

These new plans include actions that are expected to reduce absolute corporate-wide greenhouse gas emissions by approximately 20%. ExxonMobil also reaffirms it plans to achieve the goals of the World Bank for zero routine flaring no later than 2030.

In Jan. 2022, ExxonMobil announced its ambition to achieve net zero greenhouse gas emissions for operated assets by 2050, which applies to Scope 1 and Scope 2 greenhouse gas emissions.

ExxonMobil announced its Low Carbon Solutions (LCS) business on Feb.1, 2021, to commercialize the company's extensive low-carbon energy portfolio including CCS, hydrogen and low-emission fuels, where we can leverage the skills, knowledge and scale of ExxonMobil. The business is initially focusing on CCS and is advancing plans for multiple new CCS opportunities around the world to enable large-scale emission reductions, provided there is sufficient policy and market support to do so.

CCS is the process of capturing CO₂ from industrial activity that would otherwise be released into the atmosphere and injecting it into deep underground geologic formations for safe, secure and permanent storage. CCS is one of the few proven technologies that could enable some of the highest-emitting sectors to reduce their emissions, such as manufacturing, power generation and heavy industry, like the refining, petrochemical, electricity, steel and cement industries.

ExxonMobil has a unique set of competitive advantages to advance the types of CCS projects needed to meet society's climate goals:

- A proven ability to assemble and execute large, complex projects;
- Years of operational experience in each major segment of the CCS value chain: capture, transport and storage;
- A deep knowledge of reservoir characteristics and other subsurface expertise needed to design projects to inject CO₂ underground safely, securely and permanently; and
- An expansive research portfolio in CCS technologies.



ExxonMobil: Large-scale Carbon Capture and Storage (CCS) Concept of Houston Hub in U.S.

For the past three years, we've studied the concept of CCS hubs in major industrial areas with large, high-emitting sectors that are near safe and available CO₂ storage sites in geologic formations deep underground or under the seabed. The Houston industrial area is ideally suited for a CCS project of this magnitude. We are currently looking for opportunity to deploy the same concept in AP.

In April 2021, ExxonMobil announced a large-scale CCS concept that could significantly reduce industrial CO₂ emissions in the Houston area. The concept aims to capture emissions from industrial facilities in the Houston area and safely store them deep below the Gulf of Mexico seabed in natural geological formations.

In September 2021, ExxonMobil and 10 other companies¹ announced their interest in supporting the large-scale, deployment of CCS technology in Houston. These are companies with operations in the Houston area that are committed to emissions reductions and have the right skills and expertise to help make the city a leader in CCS. If CCS technology is fully implemented at the Houston-area facilities these 11 companies operate, nearly 75 million metric tons of CO₂ could be captured and stored per year by 2040.

III. Positive Social Impact Created

The results could be potentially be game changing for CCS deployment and could materially help U.S. emission-reduction efforts. Early projections indicate that infrastructure could be built to safely capture and store approximately 50 million metric ton of CO₂ per year by 2030 and about 100 million by 2040.

Capturing 100 million metric tons of CO₂ is roughly equivalent to taking more than 20 million cars off the road. It's also equal to the amount of CO₂ sequestered by a forest of about 120 million acres.

It could also generate tens of thousands of new jobs, protect current jobs and reduce emissions at a lower cost to society than many other widely available technologies.

The lessons learned with this project could ultimately be replicated in other areas where there are similar concentrations of high-emitting sectors near potential CO₂ storage sites, including AP and China.

1. Calpine, Chevron, Dow, INEOS, Linde, LyondellBasell, Marathon Petroleum, NRG Energy, Phillips 66 and Valero

A bold plan to capture and store CO₂

When it comes to helping the U.S. meet its emissions-reduction goals, ExxonMobil is thinking big. That's why we're proposing a large-scale carbon capture and storage (CCS) project to capture 10 million metric tons of CO₂ by 2040. The Channel, one of the most active and well-developed corridors, has the potential to capture effectively



ExxonMobil: Large-scale Carbon Capture and Storage (CCS) Concept of Houston Hub in U.S.

IV. Insights, Lessons Learned, and Proposals

Broad deployment of CCS in Houston will require the collective support of industry and government, with a combined estimated investment of \$100 billion or more.

Supportive policies and regulatory frameworks are critical to enabling deployment and infrastructure development at the pace and scale needed to help meet the goals of the Paris Agreement. These include:

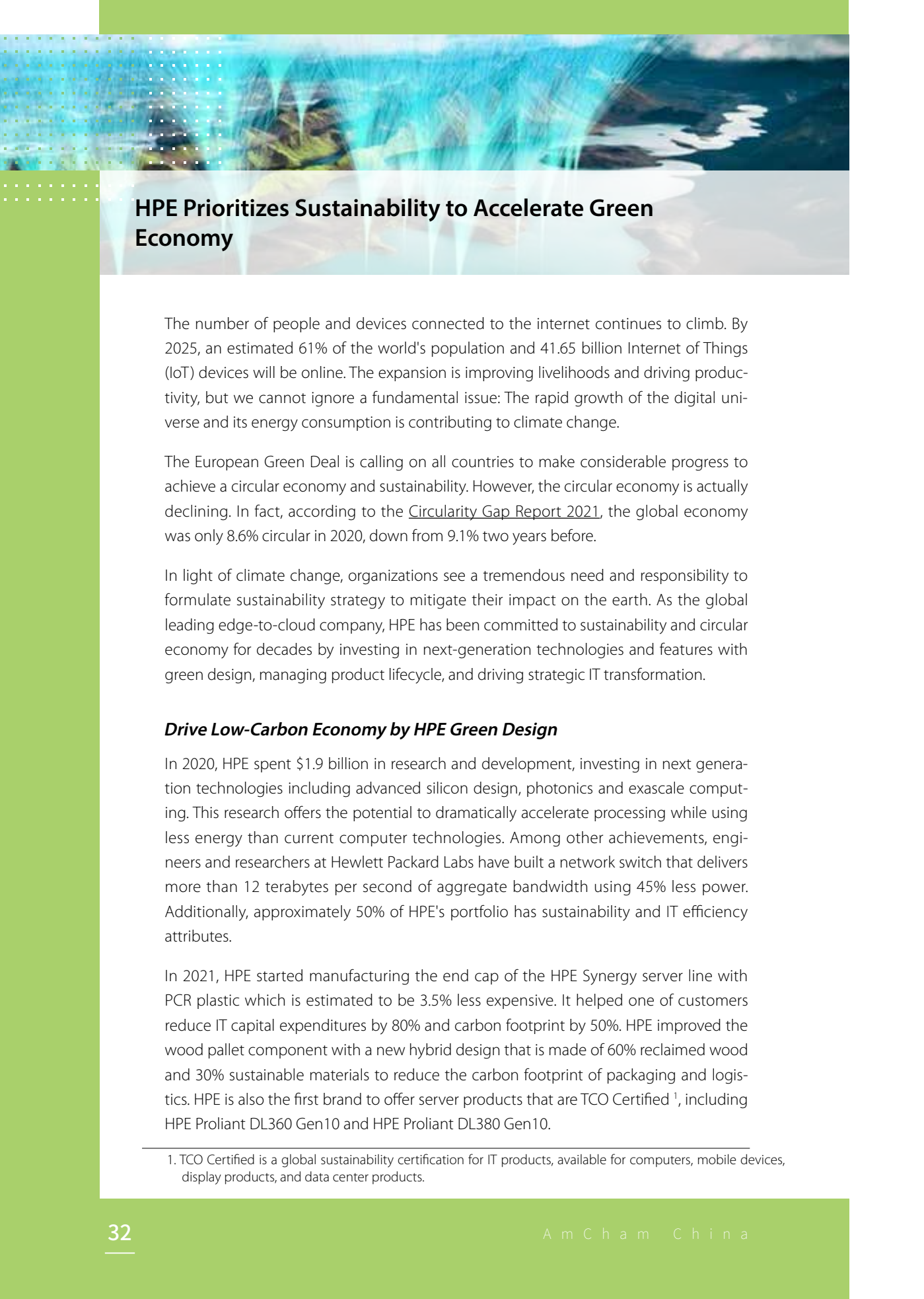
- Durable incentives that can be provided through a variety of mechanisms, such as grants, tax credits or low-interest loans
- Sustained, long-term government support for research and development; and
- Establishing a market price on carbon that supports investments

ExxonMobil is focused on proprietary projects and commercial partnership that will have a demonstrably positive impact on its own emissions, as well as those from the industrial, power generation and commercial transportation sectors. Specifically in China, ExxonMobil is interested to explore potential CCS collaboration opportunities with regulators and industry players to reduce carbon emissions in our industry.

About ExxonMobil

ExxonMobil, one of the largest publicly traded international energy companies, uses technology and innovation to help meet the world's growing energy needs. ExxonMobil holds an industry-leading inventory of resources, is one of the largest refiners and marketers of petroleum products, and its chemical company is one of the largest in the world.

ExxonMobil has a long history in China dating back to 1892. Today, our business portfolio here spans the full spectrum of the industry, from upstream (LNG) to downstream, chemicals and technology center.



HPE Prioritizes Sustainability to Accelerate Green Economy

The number of people and devices connected to the internet continues to climb. By 2025, an estimated 61% of the world's population and 41.65 billion Internet of Things (IoT) devices will be online. The expansion is improving livelihoods and driving productivity, but we cannot ignore a fundamental issue: The rapid growth of the digital universe and its energy consumption is contributing to climate change.

The European Green Deal is calling on all countries to make considerable progress to achieve a circular economy and sustainability. However, the circular economy is actually declining. In fact, according to the [Circularity Gap Report 2021](#), the global economy was only 8.6% circular in 2020, down from 9.1% two years before.


In light of climate change, organizations see a tremendous need and responsibility to formulate sustainability strategy to mitigate their impact on the earth. As the global leading edge-to-cloud company, HPE has been committed to sustainability and circular economy for decades by investing in next-generation technologies and features with green design, managing product lifecycle, and driving strategic IT transformation.

Drive Low-Carbon Economy by HPE Green Design

In 2020, HPE spent \$1.9 billion in research and development, investing in next generation technologies including advanced silicon design, photonics and exascale computing. This research offers the potential to dramatically accelerate processing while using less energy than current computer technologies. Among other achievements, engineers and researchers at Hewlett Packard Labs have built a network switch that delivers more than 12 terabytes per second of aggregate bandwidth using 45% less power. Additionally, approximately 50% of HPE's portfolio has sustainability and IT efficiency attributes.

In 2021, HPE started manufacturing the end cap of the HPE Synergy server line with PCR plastic which is estimated to be 3.5% less expensive. It helped one of customers reduce IT capital expenditures by 80% and carbon footprint by 50%. HPE improved the wood pallet component with a new hybrid design that is made of 60% reclaimed wood and 30% sustainable materials to reduce the carbon footprint of packaging and logistics. HPE is also the first brand to offer server products that are TCO Certified ¹, including HPE Proliant DL360 Gen10 and HPE Proliant DL380 Gen10.

1. TCO Certified is a global sustainability certification for IT products, available for computers, mobile devices, display products, and data center products.



HPE Prioritizes Sustainability to Accelerate Green Economy

HPE Technology Renewal Centers Empower Circular Economy


HPE Technology Renewal Centers (TRCs) are the largest IT manufacturer refurbishing facilities in the world, where HPE recovers displaced or aging assets and ensures they are responsibly and securely retired in order to extend products' useful life and minimize e-waste. In 2020 alone, HPE TRCs processed 3.1 million assets weighing more than 35 million pounds. HPE remarketed nearly 87% of those assets and recycled the remainder in a secure, environmentally responsible way.

To help customers track progress toward their business and sustainability goals, HPE released the first Circular Economy Report of IT industry in early 2019, which provides customers with information about the carbon, energy, material, and landfill savings achieved by returning retired or end-of-use assets to HPE for processing through HPE TRCs. Since its launch in 2019, HPE received requests from customers to calculate savings achieved through HPE circular economy programs, totaling 24,194 metric tons of CO₂e avoided, 1,177,083 MWh of energy saved, and 24,734 metric tons of waste diverted. Moreover, HPE Circular Economy Report is also an objective instruction and criteria for customers in future IT operation strategy developing and assets allocation reference.

Advance Sustainable Future Through As-a-Service

HPE was already well-advanced in company strategy to deliver its entire portfolio as a service by 2022 through a range of subscription, pay-per-use and consumption-driven offerings. HPE enables customers to focus on innovation and modernize their infrastructure without the capital and operational expenses of traditional IT ownership, nor the power and cooling limitations typically faced by organizations rapidly scaling their digital operations.

HPE GreenLake, an as-a-service offering, optimizes customer IT estates while executing an effective hybrid multi-cloud delivery model, which helps organizations conserve capital and manage cash flow by delivering on-premises solutions. This enables customers to focus on core business outcomes and accelerate digital transformation systematically. In 2020, an HPE study demonstrated that HPE GreenLake could reduce energy consumption by more than 30% compared to traditional models.



HPE Prioritizes Sustainability to Accelerate Green Economy

As a leading global technology company, ABB is working alongside strategic partner HPE to increase compute capacity while reducing its environmental footprint. HPE GreenLake platform and HPE edge computing drive IT efficiency for ABB robotics super-factory in Shanghai to a higher standard, while aligning to ABB low-carbon goals for environmental sustainability.

In 2015, 178 countries across the world signed the Paris Climate Agreement to limit global average temperature rise to less than 2°C from pre-industrial levels. HPE was the first IT company to set science-based targets (SBTs) to reduce greenhouse gas (GHG) emissions across the entire value chain, and HPE is committed to becoming carbon neutral across its entire value chain by 2050 or sooner.

HPE is committed to being a leader in environmental and social progress which has earned recognition from numerous notable publications and organizations. In 2021, HPE earned a position on the highly competitive DJSI World Index for the ten years, placing in the 98th percentile of the computers & peripherals and office electronics segment. HPE secured second place, earning gold medal recognition for its segment.

To be climate-resilient and fight against environmental challenge, HPE puts sustainability performance at a core business, and is accelerating a zero-carbon future with innovative products, services, and disruptive business models through as-a-service. With a purpose to advance the way people live and work, HPE will shape a sustainable world together with its customers and partners in a range of industry through unrelenting efforts.

About HPE

Hewlett Packard Enterprise (HPE) is the global leading edge-to-cloud company, committed to advancing the way people live and work. HPE delivers unique, open and intelligent technology solutions delivered as a service – spanning Cloud Services, Compute, High Performance Computing & AI, Intelligent Edge, Software, and Storage – designed to help customers develop new business models, engage in new ways, and increase operational performance. HPE released the Chinese Edition of <Living Progress Report 2020>, which is a strong advocate of corporate social responsibility driving sustainability, circular economy and decarbonization in all business sectors.



Microsoft : “AI for Earth”

I. Technological Innovation Will Play a Pivotal Role in Promoting Global Sustainable Development

Human beings around the world have a shared future. We must work together to safeguard the foundation on which humanity stands – biodiversity and sustainable global development. This is a long-term and challenging task, in which technology will play a defining role. As a global technology company, Microsoft is committed to leading by example by setting sustainable development goals and translating our commitment into action by actively cooperating with non-profit organizations, research institutions, and partners to promote the sustainable development of technology, resources, and platforms. Every year, Microsoft shares its best practice in this field. Recently, Microsoft published “2021 Environmental Sustainability Report”¹. In doing so, more people around the world can enjoy the benefits of innovative technologies and strive for a brighter future.”

II. Microsoft’s AI initiative: A Combination of Technology and Commonweal

Launched in 2017, Microsoft’s “AI for Earth” is a \$50 million, 5-year program that provides access to Cloud and AI technologies to change the way people and organizations monitor, model, and manage Earth’s natural systems in the key focus areas of Agriculture, Biodiversity, Climate Change and Water. Through grants, opportunities for education, and investments in innovative, scalable solutions, AI for Earth works to advance sustainability across the globe.

With a nearly three-decade history in China, Microsoft consistently provides technology, resource, and platform support to local non-profit organizations. With a shared vision of fusing technology and societal impact, Microsoft joined hands with the SSCC, China’s leading endangered species and ecosystem conservation organization, in 2019 to jointly build an “AI for Earth” project in China.

III. Camera Trap API: One of Microsoft’s Fruitful Projects

To date, we have awarded over 850+ grants to projects with impact in over 110+

1. 2021 Environmental Sustainability Report | Microsoft CSR

荣誉证书颁发仪式

Microsoft : “AI for Earth”

countries. Dedicated engineering and data science teams from Microsoft also provide a wealth of open-source tools, models, infrastructure, data, and API to advance sustainability and environmental science.

To overcome this challenge, Microsoft helped the SSCC build a Motion-triggered Camera Intelligent Management System based on the Azure Camera Trap API that optimized data collection and processing. The Camera Trap Image Processing API is capable of analyzing and identifying objects in pictures, including wildlife, and then classifying them accordingly. The system underwent rigorous testing to ensure that it fully meets requirements such as operational stability and data security. Boasting an image recognition accuracy of 90%, the efficiency of overall environmental data processing has been improved by 50%. This frees SSCC staff from having to navigate scattered image data and enables them to dedicate time and energy to other tasks. The system's efficacy is set to be further improved following a second phase optimization.

IV. The Significance of Data for Contemporary Environmental Protection

LV Zhi, Professor of Peking University School of Life Sciences; executive director of Peking University Center for Nature and Society; co-founder of Shan Shui Conservation Center, said, “Identifying where and how many species exist, as well as any changes in population, is a challenge for scientists. While there is not enough information for scientists to publish a paper, informing the public on their existence may give these endangered species the time and space to fight for survival.” As for the importance of data, Zhi pointed out, “Only when we share information and embark on a strategy is data transformed into a tool of conservation.”

Convenience and harmony with nature are never an either-or relationship. Safeguarding biodiversity and ensuring sustainable development are fundamental to the well-being of mankind and society's future.



IBM: Underpinning the Upgrading of Urban Smart Pipeline Network

I. Imperative of Upgrade the Urban Smart Pipeline Network

It is a historical legacy that the underground pipeline network suffers from low accuracy, fragmented materials, layout multiplication, and higher frequency for information updates in many Chinese cities. These issues have become shortcomings impeding the development of smart cities. Therefore, it is imperative to upgrade smart pipelines. However, to implement the upgrade, data that is cross-platform, cross-system, cross-organization, and covering the whole life-cycle of pipelines are needed. Apart from technical support from hardware and software, we also need a whole set of established practices and methodologies to serve as underlying theoretical support to ensure the best cost-effectiveness in execution.

II. IBM Garage™ Accelerates Collaborative Innovation and Transformation of Enterprises

Known as the **Transformation Accelerator**, IBM Garage™ is IBM's methodology for collaborative innovation based on its many years' practice. It can apply to scenarios of innovative business for all sectors. To be specific, IBM Garage™ gather IBM technical experts and sectoral experts from the client-side who in an open space to take a three-step process, Co-Create, Co-Execute and Co-Operate:

1. Opportunities and priorities for carbon neutrality in business shall be first identified at seminars where attendees discuss the structural design and reach a high-level consensus to clarify the most potential chances and projects for carbon reduction;
2. Various measures of carbon reduction are then drafted by referring to the MVP (Minimum Viable Product) iterative approach, including zero carbonization, electrification of energy, technological, transformation energy efficiency improvement, demand reduction, and carbon capture, which is followed by business calculation to figure out feasibility and validity of proposed measures. Later, these carbon reduction measures shall be tried out.
3. Finally, MVP measures of carbon reduction that are tested feasible would be rolled out and promoted in more sectors.

In practice, IBM Garage™ provides Rifeng Enterprise Group with an opportunity to pursue the smart transformation. As an important propeller for the upgrading and



IBM: Underpinning the Upgrading of Urban Smart Pipeline Network

transformation of smart water pipeline networks in Chinese cities, Rifeng has been dedicated to R&D and the promotion of a new type of plastic pipeline in China for 24 years. In this bilateral cooperation, a smart water supply network was chosen as the business scenario based on in-depth discussions, and the two sides started with the collection of pipeline data and detection of leakage points. By absorbing 5G and edge computing into this pipeline network project, they upgraded the smart water conservation. IBM's technical experts and Rifeng's sectoral experts worked systematically as a team and rapidly conducted MVP iterative development within 6 weeks. Combining DevOps with Rifeng's water supply, leakage points in pipeline network, rapid positioning and early warning, they constructed a sand board, completed the verification test., and simulated the scenario taking into account various conditions based on actual conditions of this municipal engineering project.

III. Positive Social Impact of the MVP Method

Aligned with the latest framework, this whole project is undertaken with the assistance of distributed computation to collect numerous data to raise the real-time analysis efficacy. When edge cloud is making predicative analysis of pipeline maintenance, costs induced by artificial inspection and maintenance are reducing, and the shortcomings regarding the lack of real-time data in conventional analysis of the balance between water supply and demand could be addressed. Accuracy for the leakage detection model has been elevated up to at least 95%. Therefore, Rifeng made a leap forward from 0 to 1 in edge computing and its concepts and implementation now are leading the industry.

According to XU Tenghui, Rifeng's President: "what impressed me most upon the completion of this project is that utilizing MVP of IBM and the minimum controlled costs to test the feasibility of business scenarios is of great help. In the future, Rifeng will become a benchmark for digital and smart pipeline service providers not only in China but also in the world. This is why we chose to cooperate with IBM to begin with."

IV. Conclusions and Recommendations for Businesses' Digital Transformation and Green & Low-carbon Transition

We reached a three-point conclusion for this case:



IBM: Underpinning the Upgrading of Urban Smart Pipeline Network

- 1) IBM, a 110-year-old world-famous IT enterprise, has been committed to technologies in different sectors for years. Our accumulated sectoral experience and advanced achievements in AI, IoT, and blockchain among many other digital technologies can be leveraged to support global and Chinese businesses to initiate and complete digital transformation.
- 2) Since digital transformation and green&low-carbon transition is a complicated and daunting project for companies, they need a correct and proven methodology to serve as support and guidance to ensure its right development direction. What's more, this methodology has to ensure the large-scale, top-down transformation of companies with a low and controllable cost and at the fastest speed to maximize commercial values. The innovative IBM Garage is proved to be an effective methodology for this purpose.
- 3) Finally, while pushing forward digital transformation and green&low-carbon transition, a company has to select a trustworthy cooperation partner and apply the approach of Co-Create, Co-Execute, and Co-Operate. Besides, it has to combine personnel, venues, and methodologies from two sides into a creative environment and conduct co-innovation based on best practices and with technological support. This joint force will catapult companies to the forefront of global competition.

Public-private partnerships can learn from a case in which Foshan Municipal Government took the lead and introduced IBM Garage to construct an innovative platform for companies. Governments can play a role in pulling together strengths to service companies that pursue digital and innovative transformation, unleashing greater business values.

A photograph of a modern industrial building with a glass facade, featuring the Donaldson logo. In front of the building are several flagpoles with flags, including the Chinese national flag. The scene is set against a clear blue sky with some light clouds.

Donaldson: Solving Filtration Problems for Clearer Air

The *Three-year Program of Winning the War to Guard the Blue Sky* issued by the State Council on July 3, 2018, proposed a six-pronged approach, while clarifying indicators and deadlines to combat pollution. It stipulated that actions should be taken to reduce pollution emissions and treat pollution discharged by diesel-fueled vehicles.


On December 28, 2020, the Ministry of Ecology and Environment approved and released the *Technological Specifications (Draft for Release) on Controlling Pollution Discharged by Non-road Diesel-fueled Mobile Machinery*, targeting non-road diesel-fueled mobile machinery in Stage IV and its loaded diesel engines. Therefore, shifting towards machinery products that meet national emission standards is inevitable.

China IV Standards for Non-road Equipment and China VI Regulations on Emission Discharge have created a favorable environment for heavy equipment producers adopting new technologies. In the context of China's support of the Clearer Air Program, Donaldson – one of the leading global players in filtration – lives up to its social responsibilities. Donaldson's environmental governance efforts include incorporating low-discharge filtration technologies into its products and offering users value and services while delivering environmental, economic, and social benefits.

Contributing to environmental protection with filtration solutions

According to market survey feedback, one mining client reported daily maintenance of filter elements by applying an air compressor at least once per day. Rough calculation conducted by Donaldson regarding its two-stage PowerCore PSD11 solution reveals that after all 80 mining trucks in this area have their air filters transformed, maintenance of filter element by back-flushing will decrease by 2,400 times per month, saving a cost of about CNY 6,000 and maintenance man-hours of 12,000 min. Furthermore, considering the amount of heavy dust pollution caused by back-flushing of filter elements, a 2,400 times reduction would benefit the environment and operators' health.

The air intake filter in the two-stage PowerCore® PSD11 is more capable of processing pollution. It has a compact design, and yet it offers higher dust holding capacity and longer service life. When installed in mining trucks and loaders, it can lower the overall cost of ownership while improving equipment running time and boosting production efficiency. Donaldson has transformed air filters installed on some mining trucks and



Donaldson: Solving Filtration Problems for Clearer Air

the data collected so far shows impressive results. Donaldson has received positive feedback from end users and OEMs. Furthermore, machinery installed with two-stage PowerCore PSD11 could result in an additional CNY 45,000 of profit.

Donaldson aims to create high performance filtration solutions for clients offering engine protection, cost-effective fuel consumption, longer service time and maintenance convenience. This case demonstrates how Donaldson has utilized its capabilities to help OEMs and end-users with advanced filtration technologies.

Adoption of Donaldson filtration solutions

Donaldson filtration solutions are widely used in the manufacturing industries like machinery, pharmaceuticals, food, lithium battery, photovoltaic glass, laser processing, agriculture and steel manufacturing. The iron and steel industry's carbon emissions account for about 15% of China's total carbon emissions, making it the manufacturing industry with the highest carbon emissions.

All newly built enterprises, including those expanded through capacity replacement, should meet the requirements of ultra-low emission. Most iron and steel enterprises have entered the stage of ultra-low emission retrofit of environmental protection and dust removal. Donaldson's high-efficiency dust removal solution will reduce dust and particle emissions, promote the retrofit of ultra-low emissions and support the low-carbon development of the iron and steel industry.

Donaldson's DFE modular environmental dust collector and ultra-high efficiency pleated bags have outstanding performance in energy conservation and carbon minimization that reduce initial investment, floor area and retrofitting time while improving the service life of the filter element. According to a comparison of about 460 large converters in China's iron and steel enterprises with the traditional bag filter, Donaldson pleated bags or Donaldson DFE can save RMB910 million in electricity and reduce 1.4 million tons of carbon dioxide emissions every year.

Ultra-Web® nanofiber filter cartridge and Tetratex® PTFE high-efficiency membrane pleated bags have high filter fineness and low operational resistance. This mitigates difficulties in the retrofit of dust collectors, reduces financial investment, decreases project periods and protects production from impediment. Moreover, Donaldson filtration

A photograph of a large, modern industrial building with a glass facade, identified by the Donaldson logo. In front of the building are several flagpoles with flags, including the Chinese national flag. The scene is set against a clear blue sky with some light clouds. The image is partially obscured by a green dotted pattern on the left side.

Donaldson: Solving Filtration Problems for Clearer Air

solution consume low energy during operation, substantially reducing CO2 emission as a result.

Donaldson DFE modular environmental dust collector can effectively solve the problem of ultra-low emission of dust control in steelmaking. The dust collector utilizes its unique modular design and fast assembly characteristics which enables it to be delivered, assembled and commissioned within a short timeframe. It plays a key role in achieving ultra-low emission rating of iron and steel enterprises.

About Donaldson

Established in 1915, Donaldson (U.S.), one of the preeminent global filtration solution providers, has extended its network of sales, manufacturing, and distribution across the world to provide clients with filtration solutions. It has a strong presence in On -road and off-road engineering machinery, construction, agriculture, mining, manufacturing, power generation, aerospace and other industrial sectors. As early as the 1970s, it began to conduct business in the Chinese market and established its Wuxi plant in 1997 which mainly produces products of engine filters and industrial filters. In March 2020, Donaldson won the 2019 Blue Tech Award for its super-low emission filtration technology. This not only proves its comprehensive strength in dust collection technologies but also demonstrates its emphasis on environmental protection and social responsibilities.



Amazon: Driving Cross-Sector Carbon Collaboration

Scientists tell us that we have a limited window to make unprecedented headway towards limiting global warming to 1.5 degrees Celsius by 2050. No one company or organization can do this on its own – everyone must do their part and collaborate. At the same time, organizations should continue to seek efficient paths to reduce carbon while maintaining development, as achieving both can be possible with continued innovation and partnerships.

Commitment to renewable energy investment

Amazon is making significant progress in reducing the carbon intensity of its business activities, following investments in large-scale, long-term decarbonization solutions. It saw a decrease in the absolute emissions from purchased electricity – a result of its investments in global renewable energy projects that came online in 2020 – despite increasing buildings' square footage to keep pace with business growth. Amazon is on a path to achieve its goal to be powered by 100% renewable energy step by step. Amazon is the largest corporate buyer of renewable energy, and has launched over 270 renewable energy projects globally. It continues to invest in Asia, including a second renewable energy project in China – a 100 MW wind project in Jilin Province. Once operational in 2023, the project is expected to generate more than 300,000 MWh of renewable energy per year, which would be equivalent to powering over 150,000 average homes here in China. This is Amazon's second major investment in renewable energy in China – In 2020, the company announced support for a 100 MW solar project in Shandong that is currently generating 128,000 MWh of clean energy annually.

Embracing innovation in the sustainability journey

As part of Amazon's commitment to achieve net-zero carbon goal Amazon is working to make its devices more sustainable, from how they are built to how customers use them. Amazon completes life cycle assessments to understand the environmental impact of each device type and use these learnings to set goals, from using recycled materials to investing in renewable energy. Amazon is incorporating recycled plastics, fabrics, and metals into many new Amazon devices. In 2020, it committed to make device packaging 100% recyclable step by step. It is also working to source 100% of the wood fiber in packaging from responsibly managed forests or recycled sources. From September 2020 to September 2021, Amazon made significant progress toward its goals, eliminating more than 29 million plastic bags from our device packaging to date. For new devices



Amazon: Driving Cross-Sector Carbon Collaboration

launched in 2021, 94-98% of the packaging is made of wood fiber-based materials from responsibly managed forests or recycled sources, depending on the product.

Amazon is committed to reducing its environmental footprint through recycling initiatives in its own operations and partnerships that support the development of recycling infrastructure across the industry. It is working to reduce the operational waste associated with customer fulfillment in facilities across the globe. Corrugated board is the most common material that flows through its operations, and Amazon partners with a network of third-party recycling haulers to remove corrugated board from its facilities for off-site recycling. Many of these recycling haulers also supply Amazon with the packaging materials that it uses for customer shipments, converting waste material recovered from Amazon operations into new, recycled packaging.

We're also working with our suppliers to ensure sustainability is a priority. This year, several of our supplier sites achieved UL's Zero Waste to Landfill Silver or Platinum certification. This means our suppliers handle waste in environmentally responsible ways, diverting more than 90% of their facility's waste from landfill through methods other than waste to energy. We encourage all of our suppliers to look for opportunities to minimize waste to landfill throughout their operations.

Driving collective action through The Climate Pledge

To drive collective, cross-sector action, Amazon co-founded The Climate Pledge with Global Optimism in 2019, on the conviction that global businesses are responsible, accountable, and able to act on the climate crisis. The Climate Pledge is a commitment to achieve net-zero carbon 10 years ahead of the Paris Agreement. Signatories of the Pledge form a cross-sector community of companies, organizations, and partners working together to address the climate crisis and solve the challenges of decarbonizing our economy. Joining the Climate Pledge is an opportunity for companies to be part of a community of leading businesses committed to transformational action to protect the global economy from the disruptive risks associated with climate change.

In just two years, more than 200 companies have signed The Climate Pledge, working together to achieve net-zero carbon and the Paris Agreement's goal. Pledge signatories in total generate over \$1.8 trillion in global annual revenues and have more than seven million employees across 26 industries in 21 countries. Together, the efforts by the signatories demonstrate the collective impact The Climate Pledge is having in addressing



Amazon: Driving Cross-Sector Carbon Collaboration

climate change and prompting more action to tackle the climate crisis.


Towards net-zero carbon Goal

Like many companies and countries in high growth mode, Amazon considers both the absolute tons of carbon in its footprint and the change in its carbon intensity. While Amazon's business grew significantly in 2020, its overall carbon intensity decreased 16%, from 122.8 grams of CO₂ e per dollar of GMS in 2019 to 102.7 grams of CO₂ e per dollar of GMS in 2020.

Amazon also saw a reduction in its carbon intensity at the package fulfillment level, which measures the emissions from business activities to deliver packages to customers' doorsteps. This calculation – measured in grams of CO₂e per package delivered – includes the emissions generated by Amazon's fulfillment operations where items are picked off the shelf and packages are sorted, the well-to-wheel emissions across its transportation network, and the lifecycle emissions of the packaging used to protect items during transit. Similar to its overall carbon intensity improvement, this reduction was driven by a combination of investments in renewable energy to power fulfillment facilities, efficiencies in transportation network to deliver packages, and reductions in the packaging materials used for each package.

It will take several years for the carbon reduction benefits of Amazon's investments to be fully reflected in its footprint. While Amazon is still in the early phase of decarbonizing its business, it is already seeing meaningful progress in several areas. Amazon will continue to rapidly scale its investments in carbon reduction solutions that have large, long-term impacts that will move it forward on the path to net-zero carbon. As these investments become embedded across its business, Amazon's carbon emissions will continue to decouple from its business growth, reflected in its carbon intensity metric. Eventually, it will reach a point where the absolute carbon emissions of its business will drop, even as the business grows.

Addressing the global crisis of climate change will take a combination of big, bold commitments and everyday actions. These commitments and actions have the power help stave off crisis and to create a more beautiful, livable, and breathable planet, with better jobs and increased economic development for all. Amazon is starting with actions within its own operations and then extending those innovations to its customers, suppliers, vendors, and sellers; ultimately driving positive change across sectors, and its value chains.



Dell Technologies: Closed-Loop Recycling Plastics Supply Chain

I. System standardization and innovation are essential for recycling and treatment of electronic waste


As electronic information technology develops and electronic products are constantly upgraded, the amount of electronic waste is increasing year after year. Electronic waste has become one of the fastest-growing solid wastes in the world. Data from the *China E-waste Industry Market Research Analysis and Investment Strategy Discussion Report (2020-2026)* indicate that electronic waste is increasing at a growing rate. In 2019, 53.6 million tons of electronic waste were produced worldwide, up 3.5% from the previous year. Most waste electrical and electronic products still have material value, but a significant amount of electronic waste is still recycled by individual entities and processed by small companies. Some resources cannot be fully recovered and utilized through this process; furthermore, the lengthy process generates significant amounts of secondary waste and pollutants.

Plastic produced by terminal waste of electronic products has resulted in increasingly serious environmental pollution problems, which will pose a threat to the environment, the health of animals, and coastal economic development. The issue of plastic waste has drawn universal attention from the international community, evidenced by the theme of 2018 World Environment Day “Beat Plastic Pollution Day”. According to the National Bureau of Statistics, China’s enterprises above the designated size recorded a production of 60.421 million tons of plastic products in 2018, mainly in the packaging and building materials industry. Out of this, nearly 30 to 40 percent are directly and indirectly related to the electronics industry.

II. Dell supports the creation of a closed-loop recycling supply chain

Dell Technologies is a global leader in electronic information industry and computer manufacturing, as well as a global provider of ICT (information, communication and technology) solutions. As a global leader, Dell uses high quantities of plastic in its product production and packaging. In the face of a growing plastic waste challenge, Dell Technologies has contributed a solution by applying the concept of circular and sustainable development while maintaining stable operations.

In 2014, Dell Technologies took the lead in building a closed-loop recycling plastic supply chain in the industry, taking into account the life cycle of products in the design



Dell Technologies: Closed-Loop Recycling Plastics Supply Chain


course. Dell emphasizes reuse, repair, and recyclability. We selected proper materials for collection and recycling of waste plastics and adopted relevant technologies to restore plastics, which are later used to make new plastic parts for computer products. In 2017, Dell Technologies extended the project to commercial products, using recycled old product frames to produce new frames. Dell continuously explored new ways to extend the service life of plastics and other renewable materials. Partnered with TES-AMM and Wistron Group to drive circularity in production, including a pilot expansion of our closed-loop plastics program. Everything from sourcing to production occurred entirely in China. The pilot produced 4,500 pounds (more than 2,000 kilograms) of plastic resins, which were used in display products.

Closed-loop recycling is clearly a key concept in circular economy. It refers to the use of resources in a closed-loop process through feedback mechanisms to reduce environmental pollution and boost sustainable development. Compared with other materials, the recycling of plastics is low due to many technological difficulties such as pollution-free cleaning, sorting, and separation; maintaining stable performance; and higher costs. In 2014, Dell Technologies program marked a breakthrough in the application of recycled plastic in electronic products.

III. Economic and social benefits of promoting recycling

By promoting a green and circular economy, Dell Technologies has created positive comprehensive value in terms of economic and social progress. Dell Technologies first prolongs the service life of plastics by collecting and recycling waste plastic, adopting related technology to restore plastic, and making new parts from the recycled plastic. The reuse of plastic not only saves resources, but also mitigates the environmental impact of electronic waste and discarded plastics. In September 2020, Dell received the first closed-loop plastic recycling certificate issued by the China Environmental United Certification Center Co., Ltd. (CEC), becoming the first company in China to obtain such certification.

Meanwhile, in China, Dell has, in collaboration with the Platform for Accelerating the Circular Economy (PACE), launched a plastic closed-loop recycling pilot project. The project supports the Chinese Government's goal to increase the recycling rate of electronic waste to 50 percent by 2025, with recycled materials purchased accounting for



Dell Technologies: Closed-Loop Recycling Plastics Supply Chain

20 percent. As of 2019, the project had produced 2,000 kg of plastic resin for display products. Research shows that by using closed-loop recycled plastic rather than native plastic materials, carbon emissions have been reduced by 11 percent. Currently, the components of over 125 different products manufactured by Dell Technologies use closed-loop recycled materials and such materials account for 30 to 35 percent of the components' materials. The closed-loop plastic project has contributed to an annual cost saving of about \$1.3 million. The environmental and economic benefits of the project reveal Dell's success as a leader in green innovation practices.


IV. Cooperation among enterprises to develop a circular economy

As a promoter and practitioner of circular economy, Dell Technologies hopes to have a positive impact on people and the planet by exerting its influence, technological advantages, and employment capabilities. To develop circular economy, we must not rely solely on the recycling of products. Sharing is also a core concept of the circular economy. While competitiveness continues to be important, collaboration is becoming the optimal model to bring mutual benefits to enterprises, society, and the environment.

Continuous cooperation in innovation between enterprises further drives the development of the circular economy. As part of the Platform for Accelerating the Circular Economy (PACE), Dell Technologies has partnered with Philips and HP in Nigeria to develop Extended Producer Responsibility (EPR) programs. We have also worked with the Chinese Government to develop recyclable and sustainable materials. Dell Technologies' attempt to establish an industry-wide, closed-loop plastic recycling supply chain aims not only to propel such projects, but also to share best practices and promote carbon reduction in conjunction with other players in the industry. Moreover, the use of closed-loop plastics in electronic products can also motivate other enterprises using plastic to develop a circular economy and reduce carbon emissions throughout the industry chain.

About Dell Technologies

Committed to creating technologies that drive human progress, Dell Technologies is an industry-leading one-stop and end-to-end provider of comprehensive IT infrastructure, solutions, and services with a portfolio ranging from edge computing to data center and cloud computing. Dell Technologies is the most essential technological company



Dell Technologies: Closed-Loop Recycling Plastics Supply Chain

in the data era. Since its entry into China's market in 1998, Dell Technologies has upheld the development strategy of "In China, For China". Dell has established an integrated localization system covering design, R&D, production, supply chain management, sales, and services in Xiamen, Beijing, Shanghai, Dalian, Chengdu and Suzhou to support the rapid development of its business in China and the wider world.

A photograph of a modern, multi-story office building with a glass facade, identified by the Qualcomm logo at the top. The building is set against a clear blue sky. The image is partially obscured by a green dotted pattern on the left and a semi-transparent white banner at the bottom where the title is located.

Qualcomm: 5G as a Catalyst for Lower Carbon Emissions and Green and Sustainable Development

I. 5G Technologies and Products Promote Sustainable Development

Environmental challenges and resource shortages across the world have impacted governments and enterprises in all countries, which is now gaining increased global attention. Given the current context, many nations and relevant organizations have introduced strategic measures to control and mitigate this global crisis.

As the world's leading wireless technology innovator, Qualcomm has absorbed the concept of green and sustainable development in its strategic development and governance. Qualcomm believes that cooperation with social organizations and competent authorities would contribute to addressing negative impacts induced by climate change on the environment, society, and economy. Meanwhile, Qualcomm, a promoter for R&D and application of 5G technology, has confidence that its 5G technology and products will greatly support sustainable development of the environment.

II. Qualcomm's Commitment to 'Zero Emission' through Data Analysis, R&D in Technology, and Application'

1) Qualcomm has set well-founded and concrete targets based on its production and operation status. In November 2021, Qualcomm announced its global target of zero emission by 2040. Previously, Qualcomm joined Science Based Targets Initiative (SBTi) composed of over 2,000 organizations across the world. These commitments are built on Qualcomm's existing GHG reduction targets and constitute part of its efforts in tackling climate crisis.

- Qualcomm has a target of a 30 percent reduction in absolute Scope 1 and Scope 2 GHG emissions from its global operations compared to its 2014 baseline by 2025; and a 10 percent reduction in power consumption by 10 percent each year in its flagship Snapdragon Mobile Platform products.
- Qualcomm conducted a Climate Scenario Analysis (CSA) for the first time across its whole corporation. This will allow Qualcomm to determine whether strategies should be adjusted to better cope with potential risks and opportunities. Apart from paying long-term attention to risks and opportunities relevant to climate change, Qualcomm has been trying to discover better meth-

1. To achieve net-zero global emissions for Scopes 1, 2 and 3 by 2040 -- Qualcomm Announces Goal to Achieve Net-Zero Emissions by 2040

Qualcomm: 5G as a Catalyst for Lower Carbon Emissions and Green and Sustainable Development

ods of water and energy conservation, emission reduction, and avoidance of waste in the short term. Environmental impact is listed as one of the most important factors to be taken into account when designing, building, and operating facilities. Unremitting efforts on a continued basis have maximized the efficient usage of energy and water resources, which is incorporated into all of its new buildings and projects to improve rented offices.

- In China, as of September, 2020, Qualcomm has conserved around 2 million KWH of electricity and reduced GHG emissions equivalent to 1,700 tons of CO₂. In addition, the water conservation project in its Wuxi Plant was completed in 2020 which can save 10,000 m³ of water. Qualcomm has extended service life of chemicals with modified technologies and reduced both consumption and VOC emission.
- 2) In supply chain and sustainable product design, Qualcomm has focused on creating positive influence on individuals, communities and the environment. For this purpose, it is committed to integrating the principle of sustainable development and responsibilities into its products and supply chain.

As a formal member to Responsible Business Association (RBA), Qualcomm has required its supplies to live up to RBA Code of Conduct. For many years, this COD and the Qualcomm Way have served as the cornerstone for Qualcomm to deliver on its commitment to RBA and conduct responsible supply chain management.

- 3) Actively championing 5G technology, Qualcomm has noted the positive effect engendered by 5G technology on emission reduction, environmental protection, and the creation of a green supply chain. According to the GSMA (Global System for Mobile Communications Association), 5G is 90% more energy efficient compared to 4G. ² 5G can help reduce CO₂ emissions by transforming transportation, manufacturing and agriculture. At the same time, 5G will help to transform the automotive industry through the C-V2X, making it safer and more environmentally friendly. 5G smart factories can make better use of time and materials, while reducing energy consumption. Qualcomm is committed to playing a bigger role in industrial digitalization and green evolution, and providing 5G-enabled sustainable development benefits to the society and economies globally.

2. GSMA | 5G, renewable energy and climate action - GSMA Europe



Qualcomm: 5G as a Catalyst for Lower Carbon Emissions and Green and Sustainable Development

III. Statistics: Concrete Examples of 5G Technologies and Products Underpinning Sustainable Development of the Environment

Qualcomm's impact on the industrial chain and its positive response solidifies Qualcomm's confidence in carbon emission impacts and long-term goals for the whole industrial chain.

A huge number of statistics supports Qualcomm's point of view regarding the driving force generated by 5G technologies and products for environmental sustainability: the super-low latency and extreme reliability of 5G empower new forms of services, including real-time monitoring of water usage, GHG emissions reduction, and others. 5G enables a ubiquitous broadband data network, an innovative opportunity to improve environmental sustainability, and an opportunity to turbocharge economic growth and create new jobs. In the U.S., for example:

- Reducing GHG emissions: estimated to avoid over 370 million metric tons of GHG emissions in 2025; equivalent to taking 81 million passenger vehicles off the U.S. roads for one year; canceling U.S. aviation's 2018 CO₂ emissions twice or avoiding the same amount of greenhouse gas emissions as 77,000 wind turbines running for one year.
- Household water management: saves 410 billion gallons of water per year.
- Reduction of pesticide use: cuts down pesticide use by 50 percent.
- Optimizing energy usage: raises efficiency of fuel by 20 percent.
- Facilitating green employment: adds 300,000 new green jobs by 2030.

IV. Future of 5G Technology

On October 24th, China released the Opinions on Thoroughly and Accurately Executing the New Development Concept and Delivering on Carbon Peak and Carbon Neutrality which serve as a top-level design and road-map for Dual Carbon Targets. On October 26th, the State Council initiated the Notification on Action Plan for Carbon Peak before 2030 to clarify specific targets. The Opinions and Action Plan both emphasize the importance of standard carbon emissions measurement and statistics.

The Opinions highlight the deep integration of the Internet, big data, AI, 5G and other emerging technologies with green and low-carbon industries. As for technologies



Qualcomm: 5G as a Catalyst for Lower Carbon Emissions and Green and Sustainable Development

measuring carbon emissions in real time, the Action Plan stresses on the improvement of statistics and accounting results by promoting real-time measurement technologies for carbon emission and accelerating the application of remote sensing, big data, and cloud computing in real-time carbon emission measurement.

At the same time, the CPC Central Committee has noticed that it is important to consistently enhance energy conservation in key areas such as industry, construction, transport and public facilities; as well as consistently upgrading the efficacy of data centers, new type of communication, and other IT infrastructure.

Qualcomm believes that research on the development and deployment of 5G, a general purpose technology that empowers various industries and sectors, is relevant and significant to realizing the Dual Carbon Targets. National competent authorities should conduct relevant research. As a member of AmCham China, Qualcomm would like to actively support and cooperate with AmCham China, the Social Impact Initiative, and other organizations to provide support as much as possible in conducting research into this area.

About Qualcomm

Qualcomm is the world's leading wireless technology innovator and the driving force behind the development, launch, and expansion of 5G. We invent foundational technologies that transform how the world connects, computes, and communicates, ushering in the mobile revolution. Today, Qualcomm's foundational technologies enable the mobile ecosystem and bring the benefits of mobile to new industries, including automotive, the internet of things (IoT), and computing, and are enabling a world where everything and everyone is intelligently connected.

Qualcomm has been doing business in China for more than 20 years and is inextricably linked to the growth of Chinese businesses, industries, and communities.



Danone: One Planet Initiative to Contribute to a “Beautiful China”

I. Current challenges in society

Climate change is one of the biggest challenges of our time. The Glasgow Climate Pact, adopted by nearly 200 countries at the 2021 UN Climate Change Conference (COP26) in November 2021, established goals and commitments on carbon reduction. However, it fell short of the target of controlling temperature rise within 1.5 degrees Celsius.

China has pressed the fast-forward button in recent years on carbon reduction. Since China's introduction of the “2030” and “2060” Carbon Goals, companies in various sectors have actively implemented carbon reduction strategies. However, as suggested by the Ministry of Ecology and Environment, China is facing challenges of large industrial volume, tight timeframe, and insufficient innovation capacity in low-carbon technologies. China must also confront the arduous task of green transformation, which requires mobilization and participation of the whole society to explore possible carbon reduction actions from all aspects.

II. Solutions and social impact of Danone's practice

As a global leader with a unique health-focused portfolio in food & beverages, Danone, with its frame of action “One Planet. One Health”, is committed to sustainable development and has led the industry towards carbon reduction for many years. It has pledged to achieve carbon neutrality across its value chain by 2050. In China, Danone is actively exploring methods of green and low carbon operations. In 2022, it will have the first carbon neutral plant in China. Danone is committed to achieving 100% renewable electricity by 2030.

Danone has experimented with various ways to lead sustainability development by connecting upstream and downstream partners in areas of green energy usage, packaging optimization, pollution and carbon emissions reduction, green supply chain creation, and public advocacy.

Danone reached peak carbon emissions on full scope in 2019, with 2020 GHG emissions down 1mT CO₂ eq. as compared to the 2019 level. Since 2015, Danone has reduced its full scope greenhouse gas emissions intensity by 24.5% globally.

In China, Danone made progress by strengthening corporate energy management, technological innovation, and supply chain transformation.



Danone: One Planet Initiative to Contribute to a “Beautiful China”

Leading Sustainable Development	Commitments	Achievements
Green Energy	Danone is increasing investment in green energy, building in-plant photovoltaic facilities and testing other options, like developing local suppliers and sourcing green energy directly.	In 2017, Danone installed two rooftop photovoltaic power projects at its Zhongshan and Xi'an plants respectively, which will reduce approximately 110,000 tons of CO2 emissions in electricity generation over the next 25 years of its project period. The average green energy usage rate at Danone's beverage plants in China is around 38% by the end of 2021.
Packaging Optimization	Danone is exploring more environment-friendly packaging materials and reducing the use of plastic by improvements in materials and techniques. Danone is doing this while still ensuring high packaging quality and consumer experience.	Through material substitution and technical improvements, the weight of Mizone bottles has been reduced by approximately 30% from 2004 level. To facilitate downstream recycling, Mizone bottles are made of 100% recyclable packaging materials, easier for sorting and recycling.



Danone: One Planet Initiative to Contribute to a “Beautiful China”

Reduce Pollution and Carbon Emissions	<p>Danone is</p> <ul style="list-style-type: none"> • Actively advocating the 3R principles of reduce, reuse and recycle, and promoting recycling in our plants. • Constantly looking for opportunities to recycle and reduce water consumption by improving efficiency of water production, reclaimed water, and Clean-in-place systems. In addition, Danone applies tertiary treatment to the wastewater to meet quality standards and then provides it to a municipal department for road cleaning and green land irrigation. • Packaging materials that would otherwise have been disposed as waste are used for secondary packaging or returned to suppliers; sewage, sludge, and domestic waste are sent to incineration for power generation; and food waste is recycled for composting. 	<p>Danone China plants are committed to improving water efficiency. Mizone has reduced its water consumption by 66% per bottle since 2004, with a total water savings of nearly 2 million tons. In 2020, Danone’s Wuhan plant became the first plant in China to receive TUV Rheinland’s “3-star” certification (the highest level of certification) for its zero waste to landfill management system. All Danone Waters China plants are certified as of 2021.</p>
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Danone: One Planet Initiative to Contribute to a "Beautiful China"

Green Supply Chain	Danone works with the Institute of Public and Environmental Affairs (IPE) to review suppliers' records of environmental compliance and require them to take corrective actions in case of any violation. Danone also encourages suppliers to participate in the Pollutant Release and Transfer Register Program (PRTR) to make their environmental performance more transparent.	Danone has participated in IPE's Green Supply Chain Program since 2017 and has ranked No.1 in CITI (Corporate Information Transparency Index) of the food and beverage industry for four consecutive years.
Public advocacy	In 2020, Danone Waters China launched the "LOOP" campaign to publicly advocate waste classification and recirculation. On Earth Day 2021, in response to the call of "Beautiful China Youth Action" by the Central Committee of the Communist Youth League, Danone Waters China launched the "Mizone University Student Green Action" initiative. This initiative hopes to guide students towards responsible use of water resources, packaging waste and idle goods, and advocating a low-carbon lifestyle.	Upon the launch of "LOOP" Program, Danone has placed 15 smart bottle-recycle machines in Shanghai at different places in Huangpu, Pudong and Minhang Districts. Citizens can put in any brand of empty plastic bottles and receive discount coupons for Mizone products. The program is aimed to increase public participation in green and low-carbon actions. Danone launched the "Mizone University Student Green Action" and was actively joined by 150 teams from 67 universities. The students carried out Green Workshops and innovative Green Actions focusing on specific environmental issues such as water conservation, package recycling, reuse of idle goods, and more. By mid-November, the project had 9,018 direct participants, engaging over 2.18 million people in total.



Danone: One Planet Initiative to Contribute to a “Beautiful China”

III. Conclusion and Recommendation

Companies, as drivers of production, manufacturing, and innovation, should recognize the strategic significance of carbon neutrality and ecological civilization to the future of the country and the world. They should accelerate green and low-carbon transformation, embrace green development, and contribute to the sustainable future of the Earth and humanity.

About Danone

Since Danone’s entry in the late 1980’s, China has grown to become its second largest market in the world. As of 2020, Danone operates 8 plants and employs about 8,200 people in China, which contributes about 9% of its worldwide sales. Danone understands the vast potential of the Chinese market and continues to strengthen its commitment to China. The company’s three core businesses – Specialized Nutrition, Waters, Essential Dairy and Plant-Based Products – have established a strong presence and are enjoying significant growth and sustainable development in China. Renowned Danone brands in China include Aptamil, Nutrilon, Cow & Gate, Karicare, Nutricia, Mizone, and evian.



UPS: Deliver What Matters for the World – A Sustainable Future for All

I. Sustainability Becomes a Global Issue

Rapid economic and social development have resulted in negative impacts to our environment that are becoming harder to ignore. We've seen observable effects on the environment as a result of global climate change. Countries across the world are working collectively to tackle the global climate issue. In 2015, the Paris Agreement, an international treaty on climate change was adopted at the 21st United Nations Climate Change Conference, which aims to keep the rise in global temperature to well below 2°C above pre-industrial levels, and preferably limit the increase to 1.5°C, recognizing that this would substantially reduce the effects of climate change.

Separately, the COVID-19 outbreak in 2020 has shifted economic development to a "new normal", one in which consumers are making more online purchases, further accelerating the development of e-commerce. Global e-commerce sales is projected to grow by 50% to \$7.4 trillion in 2025. Rapid e-commerce growth has inevitably led to environmental concerns, mainly with an increased need for transportation of goods. It is estimated that about 20% of global energy consumption comes from the transportation sector. These environmental concerns have created a sense of urgency for governments and companies to re-examine the importance of sustainable development.

In the past decade, the express industry has boomed in China with the development of the e-commerce sector. However, this has also led to environmental issues such as excessive packaging, plastic and air pollution. With that, China's state leaders have taken a proactive approach in tackling environmental issues. In September 2020, President Xi pledged that China aims to peak carbon emission before 2030 and achieve carbon neutrality before 2060 at the 75th Session of the United Nations General Assembly.

II. The Express Industry Supports the "Dual Carbon" Goals

Additionally, the express industry has played an important role in China's ecological civilization construction to help achieve the "dual carbon" goals. Since 2019, the State Post Bureau has promoted Green Post efforts to manage express packaging as well as promote the adoption of new electric vehicles used in the express industry.

As the world's leading international logistics company, UPS believes that sustainable development requires joint efforts throughout the whole value chain. In our latest



UPS: Deliver What Matters for the World – A Sustainable Future for All

Environmental, Social and Governance (ESG) report released in 2021, UPS announced that it is committed to achieve carbon neutrality by 2050 and have set a clear roadmap to achieving de-carbonization throughout our operations and supply chain, including to achieve 40 percent of alternative fuel use in ground operations, use 25 percent renewable electricity in our facilities by 2025; 50 percent reduction in carbon dioxide per global small package from 2020 level, use 30 percent sustainable aviation fuel, and use 100 percent renewable electricity in facilities by 2035.

III. UPS Offers Solutions to Sustainable Development in China

To advocate the Chinese government's initiatives while fulfilling UPS's social responsibility in the local community, UPS has developed an "in China, for China" strategy not only to drive business growth but also to engage with different stakeholders to realize our sustainability goals collaboratively.

- **Reduce carbon footprint:** UPS promotes the construction of green centers to reduce carbon emission footprint through the use of new energy vehicles, recyclable and degradable packaging materials, automatic sorting system and etc.
- **Reuse and recycle packaging materials:** UPS supports the State Post Bureau's green packaging initiative, where we provide customers with reusable or recyclable packaging. In China, UPS has rolled out the use of 45mm "slimming tape" nationwide, and its width has been reduced by 25% to minimize environmental impact. Besides, UPS centers use RNC (reusable network container) bags to package small export goods, which reduces the overall need for packaging and contributes to a circular economy.
- **Introduce carbon-neutral shipping solution:** UPS understands that customers in China are becoming more aware of the importance to reduce carbon footprint during delivery. Therefore, we have been promoting the carbon-neutral shipping solutions in China. Through the program, customers can fund environmental protection projects to offset the carbon impact generated. UPS's carbon neutral program supports environmental projects for reforestation, methane and landfill gas treatment, wastewater treatment, etc. UPS will compensate for carbon emissions during shipments in accordance with industry standards to reduce the impact of greenhouse gas emissions on the



UPS: Deliver What Matters for the World – A Sustainable Future for All

environment.

- **Establish public-private partnership:** UPS has actively engaged with government stakeholders and industry associations to jointly promote sustainable development for the express industry. By inviting government officials, industry experts, scholars and UPS experts, UPS has held several Green Post seminars with the China Express Association and other institutions to discuss and share ideas around topics such as energy conservation, carbon emission reduction, and new energy vehicle deployment, which are key concerns to the express industry since 2019.
- **Build sustainability mindset:** UPS leverages various media channels to promote environmental protection measures to let more partners, customers and the public understand the importance of promoting sustainable development. Over the past few years, UPS has conducted a series of publicity campaigns to promote sustainability, which was reported by many mainstream Chinese media including Sina.com, Tencent News, and The Paper.

UPS's sustainability efforts have also been recognized by governments at all levels. In the "2020 Green Post Evaluation of Express Delivery Industry" convened by the Beijing Postal Bureau, UPS was the only international express company accredited with Grade A for its environmental protection efforts. Additionally, UPS was recognized in the "Green Development Service Case" award category by the Ministry of Commerce at the China International Trade in Services (CIFTIS) in September 2021, becoming the only international logistics express company among the exhibitors to receive this award. More recently in December 2021, as the only international logistic company, UPS was awarded the Annual ESG Excellence Enterprise award by Jiemian News for sustainability and philanthropic efforts in China.

Looking ahead, UPS will continue to explore sustainable solutions in China. At the same time, UPS believes that the realization of sustainable development goals requires the joint efforts of the upstream and downstream partners in the industrial value chain. As a global trade enabler, UPS will continue to promote the green and low-carbon development of the industry and society through strong partnership with various stakeholders, to build a better home for the earth.



UPS: Deliver What Matters for the World – A Sustainable Future for All

About UPS

Founded in 1907 and headquartered in Atlanta, Georgia, UPS is a global leader in logistics and has its presence in over 220 countries and regions with more than 540,000 employees. In 2021, its turnover has reached 97.3 billion dollars.

UPS entered the China market in 1988, providing solutions for customers in multiple industries, helping promote the connectivity between the Chinese market and the global market. Today, UPS provides international services across more than 330 commercial centers and cities connecting Chinese customers with destinations in U.S.A., Europe and Asia with 226 flights per week.



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Understanding Green Skills via LinkedIn Economic Graph

I. A Green Talent Pool to Develop Green Economy

The transition to the green economy will require a large shift in the roles and skills of workers across the globe. That means growing demand and opportunities for those with green skills, as well as upskilling many workers with the in-demand skills. In September 2021, China published the Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy. This guidance established that by 2025, China will have created an initial framework for a green, low-carbon, and circular economy and improve the energy efficiency of key industries. Energy consumption per unit of GDP will be lowered by 13.5% from 2020 levels; carbon dioxide (CO₂) emissions per unit of GDP will be lowered by 18% from 2020 levels; and by 2030, China will see significant accomplishments from the comprehensive green transformation in economic and social development, with energy efficiency in key energy-consuming industries reaching advanced international levels. CO₂ emissions will reach a peak and stabilization and then decline. By 2060, China will have fully established a green, low-carbon, and circular economy and a clean, low-carbon, safe, and efficient energy system. China will be carbon neutral, reaching a new level of harmony between humanity and nature. It is estimated that the investment scale required to achieve carbon neutrality is between RMB 150 trillion and RMB 300 trillion, equivalent to an annual investment of RMB 3.75 trillion to RMB 7.5 trillion. In the process of achieving the above targets, the Ministry of Finance said it would implement carbon-peak and carbon-neutral fiscal rewards and punishments policies, linking the energy consumption, the goal carbon emission standards, and carbon emission volumes with financial rewards and punishments. LinkedIn Economic Graph can advise on whether the pool of green skills can keep up and how to best cultivate these skills.

II. LinkedIn Pushes the Development of the Green Talent Pool

LinkedIn identified 800 core green skills and more than 300 green-related skills across twelve categories, including pollution prevention, waste prevention, renewable energy, and sustainability.



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Understanding Green Skills via LinkedIn Economic Graph

Many green skills reported by our members have seen double-digit and triple-digit growth over the last three years. The fastest-growing green skills are in ecosystem management, environmental policy, and sustainable procurement. Ecosystem management skills focus on the costs of climate-induced natural disasters and extreme events, from hurricanes to fires.

Also, LinkedIn found an increasing trend of green skills among professionals in roles that are not traditionally considered green. For example:

- In Pollution Prevention, knowledge of sustainable fashion is increasingly popular among Salespeople, Designers, and Stylists.
- In Environmental Finance, sustainable investment is increasingly being reported by Portfolio Managers and Investment Analysts.
- Across all categories, Project Managers, Program Managers, and Business Development Specialists are upskilling in the circular economy.

Source: <https://economicgraph.linkedin.com/blog/building-sustainable-future-requires-green-skills>

III. Social Impacts of LinkedIn's Green Findings

With the increasing demand for green skills, LinkedIn's Economic Graph has conducted research on the classification and growth trend of the demand for green skills, which focuses on the suppliers' attitude towards the sustainable development of enterprises. from the operational perspective, providing data reference for the promotion of China's "carbon peak" and "carbon neutral" policies along with subsequent policy formulation, such as policies on training talents in relevant fields. In the exploration of green talents, under the impetus of the green economy, the demand for skills in the relevant positions has changed accordingly, which provides suggestions for the cultivation of green talents to fulfil the market demand in the future. In policymaking, LinkedIn Economic Graph provides effective and real-time policy tools to help employers, employees, and policymakers in the labour market obtain an in-depth understanding of green jobs, green skills, and their future development; meanwhile, LinkedIn's Economic Graph will be essential to predict what skills are needed for future career changes, what type of talents the industries should search for, and what policies should be adjusted.



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Understanding Green Skills via LinkedIn Economic Graph

About LinkedIn

As the world's leading professional network, LinkedIn was founded in 2003 and is headquartered in Silicon Valley, California, USA. LinkedIn's vision is to create economic opportunity for every member of the global workforce, and create the world's first Economic Graph. As of March 31, 2022, LinkedIn has nearly 810 million members from more than 200 countries and territories around the world, with the number of Chinese members currently amounting to over 55 million. In 2014, LinkedIn officially announced its entry into China and has been providing quality localized products and services to members and enterprise-level clients. In December 2021, LinkedIn launched InCareer, to continue to have a strong presence in China.

A photograph of a modern, multi-story hotel building with a light-colored facade and numerous windows. The word "VOCO" is prominently displayed in large, dark letters on the upper left side of the building. The building is set against a clear blue sky.

IHG: A Comprehensive Approach to Carbon Reduction

Published on December 22nd, 2021, the 14th Five-Year Plan of the Tourism Sector (“十四五” 旅游业发展规划) explains that the tourism sector is “the key engine to drive national economic growth”, the key industry of the national strategy, “dual circulation”, and “proposes the crucial mission for the tourism industry to expand domestic demand”. China already has 15.3 million hotel rooms by 2021 and set a pace to open three new 150+ room hotels every day for the next 25 years. Hotels provide accommodation and offer a high level of resources for utilization (including energy, water, consumables) which result in a larger environmental footprint than those commercial and residential buildings of same size. Globally, the hotel industry counts for around 2% of global carbon emissions. The growth carries substantial consequence in terms of increase in energy and water consumption, and an expanding environmental footprint.

I. Setting short-, mid- and long-term goals on carbon reduction


As one of the largest hotel chains in the world, carbon reduction is always an important measure in the responsible business strategy at IHG. Since 2017, we set a three-year target breaking down by YOY goals, with each hotel given a carbon reduction target as part of a set of formal hotel metrics. Up to the end of 2020, we reduced our absolute carbon emissions by 23.6% globally from a 2017 baseline.

In 2021, IHG launched “Journey to Tomorrow” globally and upgraded our science-based targets from 2 degrees to 1.5 degrees, setting a long-term target of 46% reduction in emission globally by 2030 from a 2019 base year.

II. Managing environmental footprint via the IHG Green Engage system with practical and universal recognizable 'Green Solutions'

All our hotels use the IHG Green Engage system, an innovative online environmental sustainability system that gives our hotels the means to measure their day-to-day environmental impact.

We worked with industry experts and hotel teams to select action items as 'Green Solutions', that are hotel specific, have a sensible return on investment and do not negatively impact the guest experience. There are detail guidelines provided for each 'Green Solution' with requirements, specification, steps to implement, proof of action,



IHG: A Comprehensive Approach to Carbon Reduction


benefit case and financial considerations. The hotels can choose from over 200 'Green Solutions' that are designed to help them reduce their energy, water, and waste, and improve their impact on the environment.

Most 'Green Solutions' are aligned with the standards from international green building and sustainability certification programs. IHG Green Engage is recognized by the U.S. Green Building Council under LEED Volume program and Green Key Global as providing streamlined pathways to certification. The IHG Green Engage system has four levels of certification that our hotels can achieve and those achieving Level 3 certification or above identified up to 25% energy use reduction.

III. Designing and implementing a range of programs and interventions for decarbonization

To achieve our ambitious carbon targets, we need a range of programmes and interventions to execute solutions across the hotel life cycle from build, operate and retrofit.

- Improve building design and engineering standards for net zero carbon hotel operations, which includes improvement to the thermal performance of the building fabric to prevent waste energy (e.g. guest room façade, window glazing).
- Increase performance and efficiency of mechanical cooling, heating, ventilation, and lighting systems throughout retrofit for existing hotels.
- Continue promoting and driving operational and behavioural changes to reduce energy and water consumptions with owners, employees, and guests. Examples include optimizing guest room allocation with pre-planned energy control for heating and cooling; utilizing building analytical data captured in the Building Management System to monitor efficiency of the engineering equipment and connected devices.
- Recognize the importance of transitioning to renewable as a key driver of our carbon reduction efforts. We already started a renewable energy strategy project mapping opportunities across our global estate.
- Incentivize hotels with higher energy efficiency each quarter and share their case studies with all hotels.

A photograph of a modern, multi-story hotel building with a prominent 'VOCO' sign on the upper left facade. The building features a grid-like structure of windows and balconies. The image is partially obscured by a green dotted pattern on the left and a white semi-transparent box containing the title.

IHG: A Comprehensive Approach to Carbon Reduction

IV. Reducing environmental footprint not only with carbon, but water and waste

By 2030, global demand for water is expected to grow by 50%. 2.7 billion (40% of the world's population) suffer water shortage for at least a month each year. To ensure we are only using our fair share, IHG worked to:

- Incorporate water efficiency measures in our hotel operations and new properties.
- Identify high water risk areas where we operate and define water strategy to tackle local basin challenges. We have been partnering with Alliance Water Stewardship (AWS) on water stewardship programs in Delhi, Bali, Beijing, Shenzhen, and Hayman Island in Australia. This program not only helps our hotels identify opportunities to reduce water consumption, but also creates collaboration with local stakeholders and other water basin users on conservation, efficiency and restoration for infrastructure to improve water safety and sanitation.


The hotel industry has traditionally seen product consumption at various stages of the guest experience and so our longer-term goal is to achieve circularity, where items can be recycled or reused on a large scale. To achieve this, we have taken the following steps:

- Transitioned our entire portfolio of almost 843,000 guest rooms to 'bulk-size bathroom amenities'. 99% of our hotels in China has incorporated bulk amenities as part of their brand standards.
- Introduced digital versions of newspaper and magazines during guest stay.
- Provided guests the option to request reduced housekeeping during their stay, which helps to reduce energy and water consumption related to cleaning.

About IHG

IHG Hotels & Resorts is a global hospitality company, with a purpose to provide True Hospitality for Good.

With a family of 17 hotel brands and IHG Rewards, one of the world's largest hotel loyalty programmes, IHG has nearly 6,000 open hotels in more than 100 countries, and a further 1,800 in the development pipeline.



IHG: A Comprehensive Approach to Carbon Reduction

InterContinental Hotels Group PLC is the Group's holding company and is incorporated and registered in England and Wales. Approximately 325,000 people work across IHG's hotels and corporate offices globally.



Syngenta Group China: Climate-Smart Agriculture Safeguards Agricultural Production from Climate Extremes

On January 15th, a submarine volcano in Tonga (an island nation in the South Pacific) erupted. Volcanologists called this eruption "the most violent volcanic eruption of the 21st century." The blast caused an earthquake measuring 5.8 on the Richter Scale and triggered a tsunami that affected many countries along the Pacific coast. According to expert analysis, large amounts of volcanic ash covered the surrounding areas. There was significant concern that the ash would affect global agricultural production.

1. We must enhance the agriculture industry's ability to adapt to climate change.

Historically, there have been many global events where significant volcanic eruptions have affected agricultural production. For example, in 1815, the eruption of Mount Tambora in Indonesia was one of the largest eruptions in history. This eruption caused crop failures in Europe and America, resulting in a sharp rise in grain prices in New England (the northeastern region of the U.S.). The eruption also affected the climate of Asia, resulting in famine in Yunnan, China.

How do volcanic eruptions affect agricultural production? According to the Chinese Academy of Sciences' Institute of Geology and Geophysics, volcanic ash turns into volcanic aerosol when it enters the stratosphere. If the amount of volcanic aerosol is large enough, it can reflect and absorb solar radiation, causing the Earth's surface temperature to drop. This decrease in surface temperature can ultimately affect the global production of agricultural products. Such an impact may last for months or years, depending on how long the ash lingers in the atmosphere.

Currently, humans can't prevent volcanos from erupting. All we can do is minimize the impact that the extreme weather brought by eruptions has on agricultural production. Therefore, we must enhance the agriculture industry's ability to adapt to extreme weather and climate change. To accomplish this, we must make our agriculture practices and food systems "climate-smart" to respond to the global climate crisis.

Over the last four decades, a drop in the quality of cultivated land, the deterioration of soil health, a severe shortage of groundwater resources, a decrease in soil organic matter content, and the degradation of ecosystem functions in the Northeast and North China Plains (two of the major grain-producing areas of China) pose significant challenges to the sustainability of China's agriculture and food supply.



Syngenta Group China: Climate-Smart Agriculture Safeguards Agricultural Production from Climate Extremes

Chinese governments at all levels have issued measures and suggestions to enhance soil health, including subsoiling, deep-plowing, and straw deep-burying. Although these measures improved soil quality to a certain extent, after straw returning, the operating cost increased, and the winter wheat production decreased due to a series of straw management and seeding problems. As a result, the sustainable tilling recommendations made by the government failed to become popular in the Huang-Huai-Hai region.


II. The "Straw Returning and Soil Health Improvement" program supports the research and development of climate-smart agriculture in China.

"Climate-smart" agriculture is a method of sustainable development recommended by the Food and Agriculture Organization of the United Nations in 2010. In addition to increasing the ability of agricultural production to meet the increasing food demand caused by growing populations, "climate-smart" agriculture can also reduce carbon dioxide and greenhouse gas emissions. Owned by Sinochem Group, Syngenta Group China vigorously promotes the research and development of climate-smart agriculture in China.

In December 2020, the United Nations Development Programme (UNDP), Rural Energy and Environment Agency, Ministry of Agriculture and Rural Affairs, and Syngenta Group China officially initiated the "Climate-Smart Agriculture Program — Straw Returning and Soil Health Improvement in the Northeast and North China Plains." This program aims to promote and apply the practice of straw returning and other sustainable tilling practices in the Northeast and North China Plains to improve soil health, reduce water consumption, and promote green agricultural development. Three main advantages of this program are listed below:

First, this program will promote and improve straw returning, minimum tillage, and no-tillage technology. The technology that will be promoted includes no-till planters, which will enable seed sowing and fertilization to be completed simultaneously. These measures will help improve the sowing quality of winter wheat and increase soil organic carbon sequestration.

Second, by adopting optimized nutrient management technology and environmentally-friendly plant protection technology, chemical inputs and N₂O emissions will be reduced.



Syngenta Group China: Climate-Smart Agriculture Safeguards Agricultural Production from Climate Extremes

Third, the optimized sustainable tillage technology will ensure stable crop yields and quality, minimize soil moisture loss, improve the water-use efficiency of crops, and boost soil health. The new technology will also create a virtuous cycle of farmland ecosystem improvement.

Additionally, to increase soil health, reduce greenhouse gas emissions, and improve carbon sequestration, this program will introduce four new types of agricultural management technologies. These four new management technologies include soil tillage technology, soil nutrient management technology, crop residue decomposition technology, and technology designed to prevent and control diseases, pests, and weeds. These technologies are designed to mitigate challenges that may arise when using the straw returning method.

Syngenta Group China has launched multiple pilots of this program in the Northeast and North China Plains to correspond with different soil properties present in the region. These pilots are located in Fumeng County, Fuxin, Liaoning Province; Huachuan County, Jiamusi, Heilongjiang Province; Qihe County, Dezhou, Shandong Province; Feixiang District, Handan, Hebei Province; MAP Demonstration Farm, Gaocheng County, Shijiazhuang, Hebei Province; MAP Demonstration Farm, Ren County, Xingtai, Hebei Province; MAP Demonstration Farm, Linying County, Henan Province; and MAP Demonstration Farm, Funan County, Anhui Province.

III. How well does this program work? The data speaks for itself.

This program was implemented on a trial basis for one year. Results show that compared to traditional development methods, it does not decrease wheat yield and is effective at increasing soil nutrients. Straw returning and rotary tillage increased the organic carbon content of the soil by 14% during the growing season for wheat in Feixiang District, Handan, Hebei Province. In Huachuan of Heilongjiang Province, the four new methods of management technology have reduced farmland greenhouse gas emissions by more than 35% without reducing the yield of corn. Using the "one year of plowing tillage and two years of rotary tillage" and straw returning techniques increased wheat yield by 11% and decreased the carbon footprint per unit of wheat by 8% in Qihe County, Dezhou, Shandong Province. In Fuxin, Liaoning Province, where straw mulching was used, the corn yield has increased by 10.66%, the partial factor



Syngenta Group China: Climate-Smart Agriculture Safeguards Agricultural Production from Climate Extremes

productivity from applied N has increased by 10.02%, and the indirect CO₂ emission has decreased by 15.03%.

- In terms of water-saving, conservation tillage can increase soil storage by about 7% per year, which is equivalent to storing an additional 180 liters of water per hectare of soil.
- In energy-saving and emission reduction, compared with traditional tillage management, conservation tillage can reduce fuel consumption of tillage machinery by 57.8%, and greenhouse gas emission by 60.1%.
- In terms of soil nutrients, conservation tillage can increase nitrogen by 13% and phosphorus by 10% on average. The organic carbon sequestration of soil layers with a depth of less than 40 cm has increased by 7% on average.
- In reducing costs and increasing profitability, with conservation tillage, the cost of agricultural production has been reduced by about RMB 1,500 per hectare. Additionally, the sustainable yields created by conservation tillage have increased the annual net income of farmers by about RMB 2,700 per hectare on average.

This program includes a series of experiments, training workshops, and demonstrations so that farmers can benefit from climate-smart agricultural technology. Last year, organizers demonstrated the effects of climate-smart agricultural technology on more than 28,900 acres of land, held 45 technical workshops, and trained more than 28,000 farmers. Program researchers also refined the straw return technique and other methods of sustainable conservation tillage to respond to regional soil differences. Compared with traditional farming, the average crop yield has increased by more than 8%, and indirect CO₂ emissions have been reduced by 15%. The ecological and economic benefits have been significant.


The "14th Five-Year Plan for National Economic and Social Development of the People's Republic of China" emphasized a strategic focus on "creating climate-smart agriculture and improving agricultural technology." In addition to making agricultural practices more sustainable in response to climate change, conservation tilling and straw return are two techniques that help to ensure stable crop yields and increase income for farmers. Ultimately, this program will improve the quality of cultivated land and assist farmers in coping with the adverse effects of climate change.



Syngenta Group China: Climate-Smart Agriculture Safeguards Agricultural Production from Climate Extremes

V. How to cope with the impact of global climate change on agricultural production

Although we can't alter extreme weather conditions, we can adapt our agricultural practices to suit the changing climate. Syngenta Group will use data-driven agricultural methods to minimize the adverse effects of climate extremes on farming and ensure the sustainability of China's agriculture and food supply.



Elix Water: Industry Leaders in Carbon-Friendly Packaged Water

Challenges to carbon reduction in drinking water industry

Bottled water is popular with consumers because of its convenience, but the environmental problems it poses cannot be ignored. Data shows that 275 million tons of plastic waste is produced globally every year, of which about 8 million tons goes to the sea, eventually polluting the marine environment. Large amounts of plastic are being produced and threatening the lives and health of animals and humans alike. At the same time, global warming is exacerbating problems such as melting glaciers and warming lakes, affecting the lives and growth patterns of many plants and animals.

With the Paris Agreement's carbon reduction targets set, mitigating the effects of global warming through concerted efforts to reduce emissions has become a key concern for all industries.


Elix Water is promoting a new form of drinking water packaging - paper bottle water - to help reduce carbon emissions while maintaining convenient lifestyles.

Alternatives to water in plastic bottles

As with all highly competitive industries, cost leadership becomes one of the core pillars driving all strategic decisions. Plastic bottles are an attractive solution for water packaging but Elix Water is acting to minimize the amount of plastic used in comparison to PET bottles already on the market with paper-based packaging for drinking water. This promotes an evolution and upgrade of the low-carbon lifestyle, accelerating the process of replacing plastic-based packaging with paper-based in the bottled water industry. By encouraging people to use more paper-based packaging, raising awareness of existing environmental issues and mobilizing people to participate in the plastic reduction movement, we promote green and low-carbon living and supporting the environment. From bolstering rich biodiversity, food security and sustainable livelihoods to caring for the planet's ecology, together we can safeguard the planet's green ecology!

Adopting environmentally- friendly packaging

Elix Water is committed to providing drinking water in paper-based packaging to China and the world. The packaging is 75% made from paperboard, which is derived from



Elix Water: Industry Leaders in Carbon-Friendly Packaged Water

wood, a renewable and naturally degradable raw material. 100% of the paper used originates from FSC™ certified forests, preventing the purchase of products sourced from areas with endangered species or illegal logging, assuring consumers that the products come from forests that meet the social, economic and ecological needs of current and future generations.

The paper-based packaging used by Elix not only ensures a renewable packaging supply but is also widely considered to be the lowest carbon footprint form of beverage packaging. The box-shaped carton design facilitates more efficient transportation, thus further reducing carbon emissions.


In addition, Elix reduces logistics-related carbon emissions through local filling, while driving local employment.

Elix Water in paper packing helps China reduce carbon emissions

By replacing plastic bottled water with paper-based packaging, Elix Water helps businesses such as hotels, airlines and railway companies to reduce plastic use at source, recover and recycle post-consumer paper bottles, advocate recycled solutions and advocate for a sustainable circular economy model. The paper-based packaging incorporates aseptic packaging materials and easy-to-open pull-tabs, reducing plastic use by 86% compared to plastic bottle packaging of the same volume. All components of the paper bottle (paperboard, polymer and aluminum) can be reused after reprocessing. Paper-based packaging has a lower carbon footprint during production and is easier to compress during the recycling process to reduce the space taken up by individual packages and maximize the overall space efficiency of transport.

The materials used in paper-based aseptic packaging (paperboard, polymer and aluminum) can be 100% recycled, helping to reduce the consumption of valuable resources in the environment. After being sorted and baled, the collected paper bottle packaging is sent to a recycling plant where the paper is separated from the polyethylene and aluminum through hydro-pulping technology and then transformed into useful products such as paper bags, notebooks, outdoor benches (already used at Shanghai Disneyland) and other products.

According to statistics, for every ton of Elix packages recycled, about 650kg of pulp and



Elix Water: Industry Leaders in Carbon-Friendly Packaged Water

about 200Kg of plastic can be regenerated, which is equivalent to saving 1.64 tons of oil, reducing 1.94 tons of carbon dioxide and saving 6.76 cubic meters of landfill.

About Hansen Hengye(Beijing) Commercial Co,Ltd

About Elix Water

Elix Water is a self-developed product Hansen Hengye (Beijing) Commercial Co., Ltd. that upholds the concept of sustainable development by providing enterprises and consumers with more environmentally friendly and healthier drinking water, advocating the sustainable development model of recycling, encouraging and supporting enterprises and consumers to recycle empty boxes and recycle them into something useful, encouraging people to use more paper-based packaging.

Hansen Hengye (Beijing) Co., Ltd. maximizes the value created for its customers, starting from the source, and exploring new ways of reusing resources in different contexts with the help of constantly upgraded environmental protection concepts and green ideas to create a new sustainable lifestyle. The company is willing to explore more possibilities of low-carbon environmental protection cooperation with relevant parties.



Cotton Council International: USCTP's Contributions to Sustainable Cotton Production

I. Companies lack sustainability awareness and have difficulties in implementation

Companies lack a comprehensive understanding of the sustainability concept. It takes an extended amount of time and effort to convince the mills and manufacturers to adopt sustainable sourcing strategy in their business operations. Finally, it is difficult to offset the increased costs and justify the benefits/ROI at the beginning stage of implementation of sustainability goals.

II. Solutions implemented by U.S. Cotton Trust Protocol

Under China's 2030 and 2060 carbon goals, the textile industry in China is shifting in the direction of intelligence, quality, and green development. The Trust Protocol will be a tool for mills and brands to source and track sustainably-grown US cotton fiber and provide measurable and verifiable goals for their commitment to sustainability.

We have arranged the Cotton Days, COTTON USA SOLUTION Seminars, and numerous meetings with our existing and potential licensees and partners to introduce USCTP in China's mainland and Hong Kong. We have also been working closely with cotton and textile industry associations to support each other in pursuing our mutual sustainability goals. Below are three major ways for Cotton Council International to promote its activities in China:

- Collaborating with the cotton textile associations in China.
- Gaining endorsements and support from influential brands, mills, and manufacturers.
- Leveraging social media to boost awareness.

III. Positive social impact created by U.S. Cotton Trust Protocol

In the US, the 16,000 cotton growers have made tremendous progress in terms of cotton production practices. From 1980 to 2015, US cotton production has used 79 percent less water and 54 percent less energy. Producers have reduced greenhouse gas emissions by 40 percent, and land use and erosion by 49 percent and 37 percent respectively.

It doesn't stop there. The US cotton industry, as a whole, is committed to continuous



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Cotton Council International: USCTP's Contributions to Sustainable Cotton Production

improvement and innovation. To set a new standard in sustainable cotton production, as part of the 2025 US National Goals, the industry plans to further reduce water use by 18 percent; energy use by 15 percent; greenhouse gas emissions by 39 percent; and land use and erosion by 13 percent and 50 percent respectively, while increasing soil carbon by 30 percent.


Since the official launch of USCTP in 2020, about 550 mills and manufacturers and nearly 40 global and domestic brands and retailers in more than 20 countries have joined the program. We also have had approximately 300 cotton growers complete all requirements for participation in the 2020 crop. Production by those producers was about 325,000 tons, or roughly 10% of the 2020 harvest in the US. The program aims to at least double participation for the 2021/22 protocol year.

IV. Insights and Lessons Learned

1. Localization is key. We have been able to use the language that local textile industries can understand to deliver our sustainability goals and ideas.
2. Digitalization is increasingly important. We have produced trainings for the local mills to familiarize staff with the digital platforms to track their transactions and shipment orders.

About Cotton Council International:

Cotton Council International (CCI) is a non-profit trade association that promotes U.S. cotton fiber and manufactured cotton products around the globe with our COTTON USA™ Mark. Our reach extends to more than 50 countries through 20 offices around the world. With more than 60 years of experience, CCI's mission is to make U.S. cotton the preferred fiber for mills/manufacturers, brands/retailers and consumers, commanding a value-added premium that delivers profitability across the U.S. cotton industry and drives export growth of fiber, yarn and other cotton products. For more information, visit www.cottonusa.org.



Ballistic Architecture Machine: Normalizing the Idea of Locating Waste-related Infrastructure Within Urban Center

I. General context

The project addresses the widespread challenge of municipal waste management. On an average day, Shanghai produces about 33,000 tons of trash. Since the 1960's the landfill has been the most widely used waste management option. At the same time, landfills are essentially underutilized extracted resources. To this point, the Waste to Energy (WTE) Power Plants, provide a solution enabling us to extract more embedded energy from our waste. China as of 2017 had 303 WTE plants operating in mainland China, processing a total of 304 thousand tons of waste per day.¹

However, the public's general unawareness of the technology as well as the unattractive industrial aesthetics of WTE-plants sides them with other heavy industry and factories and makes victims of social opposition and phenomena such as the Not in My Backyard (NIMBY) pushing industrial developments to the far outskirts of the city. This in its turn reduces the transformative potential of the WTE technology by increasing costs associated with transportation and infrastructure needed to move the waste and resulting energy between consumers and the processing WTE plant. Moving waste infrastructure into the city core is the key to furthering the paradigm shift in waste management.


II. Context of WTE in China

The farther plants are away from urban centers, the greater the expense of operating, particularly with relation to the hauling waste, not to mention the added emissions from trucks. European, Japanese, and Singapore plants tend to attempt innovation with the equipment itself, to save on space. This is essentially nonexistent in China.

BAM's design for the Baoshan plant attempts to move away from the highly prevalent 'decorated shed' paradigm. By understanding that in the future these types of facilities may need to be directly integrated into highly populated urban cores, BAM seeks to find ways to experiment with ideas in which these types of facilities are also viewed as more than infrastructure, but as urban amenities.

Landscapes and parks are welcomed urban amenities. While the Baoshan WTE plant is far too large to go unnoticed as such, the treatment of the roof as a forest and landscape takes a step towards the idea of prototypes for such facilities which could go entirely unnoticed in an urban core.

1. Current situation and experience of waste to energy in China, Haiyun Xu, China Urban Construction Design and Research Institute Co.Ltd. <https://www.asiacleanenergyforum.org/wp-content/uploads/2018/06/Xu-Haiyun-Current-Situation-and-Experience-of-Waste-to-Energy-in-China.pdf>



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III. Site context

The project is located in Shanghai's Baoshan district approximately 38 km to the north of the city center, along the Yangtze river delta, in what used to be a functioning steel plant.

The Baoshan WTE plant is said to be Shanghai's last plant to be constructed for quite some time. Apart from the most critical aspect of the plant, producing power and dealing with Municipal Solid Waste (MSW), it is also imagined as a showcase to elevate critical green infrastructure technologies.

The blast furnace plays a critical role in the concept of the design as there exists in one site and over a relatively short period of time opposing stances towards the environment and carbon emissions. The site itself could be viewed as a microcosm for the larger shift occurring in Chinese industry, energy practices, carbon emissions, and most importantly how this narrative is formulated. Quickly transitioning from one of the world's most heavily polluting industrial outputs, the smelting of steel, to a green technology power plant all at the same site has the potential to be very emblematic of larger trends.

BAM committed to creating a facility more akin to a landscape or entertainment district which can potentially normalize the idea of locating waste-related infrastructure within the urban center. To do so BAM uses the camouflage approach, utilizing various landscaping, architecture, design and programming means.

IV. Plan Implementation

The architectural program for the site includes a 3000 ton/day Waste to Energy plant, leachate tanks, and anaerobic digestion vats. Additional programs include the office and operations building, education and exhibition, greenhouse, and restaurant. Landscape programs feature a 10ha roof park.

Design – Strategy

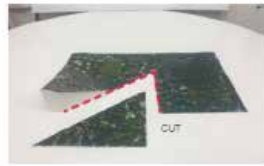
Blast furnace remaining as a key aspect of the industrial heritage of the park. A corner of the site was then 'lifted' in order to place the WTE program underneath. The internal layout of the plant was developed in a way as to place the main operations facilities

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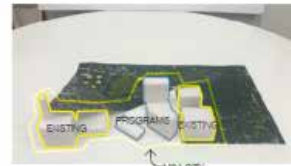
diagonally, forming the hypotenuse between the iron ore feeder belt structure and the blast furnace, creating a triangle. This open zone was dubbed 'the mini-city' as in the initial phases of the project a large variety of exhibition and entertainment programs were imagined for this space. Given the distance from the city center, the ark was envisioned as a destination in which formal activities, events, restaurants, and other amusement programs would take place. The triangular space created by the WTE plant on one side and the old steel infrastructure on the other two defines a public landscape which through heavy programming and curated activities is intended to bring the general public in alignment with the idea that the WTE technologies are not scary, polluting, and smelly, places but instead are critical urban infrastructure to be comfortable with. The second key purpose for the rotation of the plant on site is to allow the planned second phase park to slope up and seamlessly connect to the roofscape park.



PLANT UNDER TILTED PARK
在下方置入电厂




PLANT IT INTO REAL SITE ENVIRONMENT
将场址环境置入



ADDING PROGRAMS TO FORM A REAL CITY
将功能空间与现状结合





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Design – Landscape


The landscape of the plant is the most important feature of the design. The approximately 90,000m² roof is a park landscape with a variety of gardens and activity spaces, which also functions as part of the visitation route which will be enjoyed by the public. Apart from the social and cultural role, it is also ecologically ambitious. Water collection is an important aspect of such a large rooftop. The abundance of soil depth creates ideal conditions for forest planting, which apart from assisting to sequester carbon will also help to keep the air smelling clean.

V.Positive social impact

- 3800 ton/day Waste to Energy plant
- 10ha public park
- 10+ education and exhibition spaces for the district
- Educating the public about Municipal Waste Management and its relation to climate change
- Cultivating the public's acceptance to the presence of WTE-plants in the city
- Generating new type of public green space and associated programming for the city

There are very few examples of MSW treatment facilities being utilized as public parks, however we predict that this trend will start to pick up and become more popular. China is currently lacking in this regard. There is one other example of a WTE Plant in the new city of Xiong'An which is similarly attempting a park landscape atop the roof of the plant. During BAM's research we had also located an already constructed sewage facility in Yunnan which garnishes a park on top. While the design of the park is clearly not well planned nor executed, it does appear to be a first step in China, towards the idea that these types of facilities can become landscapes. Other international examples of underground sewage treatment facilities with parks atop are much more common and appear to be executed at much higher levels.

Firms that only provide 'functional' and standard engineering practices are losing ground in the face of changing trends and a greater need for urban-oriented thinking



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and publicly oriented storytelling. BAM reaches out to see the potential of design that can bring greater visibility to issues that people typically take for granted or simply are not interested to know about. BAM is dedicated to pursuing more projects in municipal waste management and other related projects aimed at integrating urban services infrastructure into the public urban life and is eager to explore various forms of partnerships around these topics.



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