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New opportunities during the process of achieving carbon neutrality in China

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I. Abstract

In promoting carbon neutrality in China, eliminating low-end capacity in energy and power generation, decarbonization will be the ultimate response to the demands of corporate business models, manufacturing industries, and higher lifestyles (ETC & RMI, 2019). Significant changes in energy supply and consumption patterns are on the horizon and accelerated.

Using secondary sources in the literature section demonstrates the opportunities and challenges for people and provides relevant economic analysis and assessment of policies. The most promising areas for investment are renewable energy (Photovoltaic power generation, Wind power generation), power grids, and energy storage. It is worth pointing out China's abundance of solar and wind energy resources. New government projects of ultra-high voltage transmission systems that address the uneven spatial distribution of resources. The introduction of energy storage to address uncertainty in the timing of energy creation, and grid-connected generation has improved the efficiency of electricity usage. Related decision-making needs depend highly on government policies, subsidies, and project scale.

There are certainly challenges to consider: the installation of many facilities is delayed due to pandemics, which has significantly impacted the supply chain of wind power, further reflecting the lack of capacity and offshore wind power supply in China. Profitability of PV and wind power generation projects is highly dependent on government subsidy and the cost of projects decrease while installation capacity increases, other clean energy resources do not have the same correlation. This paper also offers some innovative approaches to individual and small companies. At the end, the importance of innovation and technology have been emphasised.

Using interviews to find investment and employment opportunities, three experts in the field of carbon neutrality answered questions about practical and feasible paths for people wanting to take advantage of the trend. The content analysis for the interview points out people could do some research on each sector and combine sustainability transformation with the field they are familiar with and find opportunities in their daily life and pay more attention to the policy. The field is currently in its initial stage, so the

infrastructure building relies heavily on input investment then having profit. They can also invest themselves to acquire more knowledge to help them familiar with the future trends transforming from traditional environmental disruption to a new environmental and ecological friendly. Using surveys with descriptive analysis to find out people's initiative, most people noticed that the carbon neutral industry creates more possibilities in combination with their current careers, and they have a strong wellness to make the transition to both career and life sides.

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II. Introduction

In 2020, Sep.22, in the 75th United Nations General Assembly (IAC & RMI, 2020), the President of China announced that the Chinese government will increase its national contribution, adopt stricter policies and measurements that achieve carbon peaking by 2030, and achieve carbon neutrality by 2060. Even though the last three decades China has had a very rapid economic development, heavy reliance on fossil fuels has resulted in irreversible damage to the environment. (Reinventing Energy Group, 2016). It is such a great relief for the Chinese government to become aware of the subject matter and its ambitious carbon-neutral goal. And in China, there are huge potentials to be explored in renewable energy resources and finding effective and practical alternatives for fossil fuels (ETC & RMI, 2019). To achieve carbon neutrality, Supply and consumption patterns of energy will cause major changes. An energy system with a lower total volume and a more optimised structure will usher in (IAC & RMI, 2020).

Thanks to undergraduate study at the Tecnocampus (UPF) has endowed the author with a solid understanding of business essentials related to company's structure, strategies, and the decision-making process. Besides the academic side, personal values such as social responsibility for everyone in society have been strongly noticed by the author in the living environment. Lastly, in a fast-changing business environment, A competent businessperson should learn more about trends in time horizons to achieve better personal value and help others in the society to have a better life. In addition, as an international student studying in the Catalonia region, Extensive exposure to different cultures through daily interactions with faculty members allowed the author to understand the diversity of each local community when approaching environmental protection in different cultural contexts. Thus, each innovation approach took advantage of local conditions and individual preferences in this project.

The post-pandemic crisis is happening in China. To minimise the risk of Covid-19 spreading, the government has restrictions on the logistics industry between China and the rest of the world, affecting the transportation and manufacturing industries. More than 18 million small and medium-sized enterprises, which account for nearly 80% of jobs and 50% of private-sector exports, faced suspended production, too much unsold inventories due to the reduced purchasing power of people… They could not pay their employees and the cost of running the

company. Many companies went bankrupt, and many people lost their jobs (Vasiev, M. et al., 2020). So, they are eager to find ways to transform their businesses, and opportunities to work.

This project argues for individuals or small companies to help them get through the financial crisis by providing ways to keep various transformation approaches and some basic reference to evaluate projects. The conclusion of this paper is an excellent way to get started for those who don't have any previous experience in the carbon neutrality field but want to seize the opportunity to make change.

In this paper, Qualitative(interviews) and quantitative(survey) methodology will collect, analyse, and present the breakthrough, trend, and core drive of the carbon-neutral areas. Using interviews as methods to find more precise insights, Three experts in the carbon-neutral field answered questions regarding interpretation of economic work conferences, views on new policies, speculation on areas worth to work or investing, optimization fund portfolios… Based on the links between each person's answers and the literature review to determine if it is the right solution for people and small companies, and at the end to conclude with recommendations and implementation options. And a survey to conclude people's initiative toward the low-carbon transformation and lifestyle and find connections between the literature and experts' opinion.

III. Key Words

Green energy, electricity grid, energy storage.

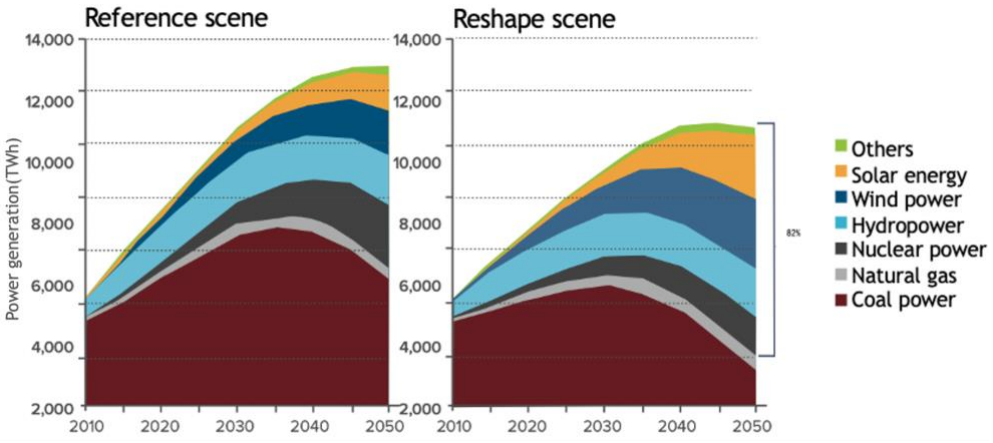
investment; sustainable development

IV. Literature Review

This paper focuses on relevant studies focusing on opportunities and possible challenges regarding low-carbon transactions with the evaluation of policies and some possible innovative approaches and research on decision-making processes to review the energy sector for further development.

A. Opportunities

A large and growing body of literature (Reinventing Energy Group, 2016) has investigated the forecasting of main paths to reshape energy. The electrification level will continue to increase in China, with per capita electricity demand reaching 7,900 kWh/year. The electrification rate will be 41% in 2050. The development of renewable power is accelerating, becoming 68% of the country's total power generation, and non-fossil management will contribute to 82% of the country's entire power generation (Graph1)(Reinventing Energy Group, 2016). IAC&RMI (2020) has established a clear view of a vast investment market in seven areas. By 2050, the market size will accumulate nearly 15 trillion yuan. Photovoltaic and wind power projects will become 70% of the total installed capacity in infrastructure investment, including many installations on the power generation side. Cross-regional transmission channels with continuous growth in capacity, which are 22 times the 2016 figure, are investment fields necessary for investors to pay attention to.

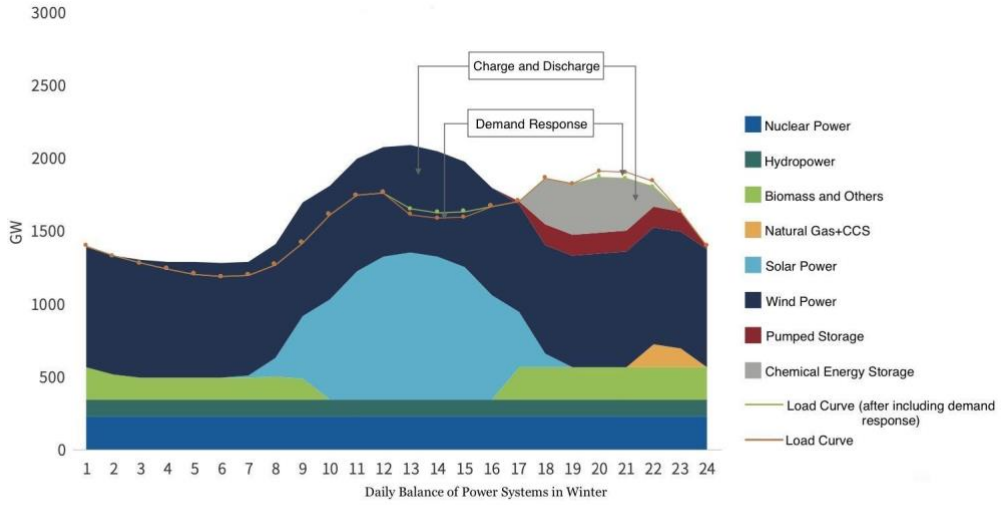


Graph 1. Reference and Reshape Scenario of Power Generation Structure

The 7th chapter of the Energy Transition Commission (ETC &RMI, 2019) gives solid support to previous literature by providing evidence. For two-thirds of the national land area, the annual solar radiation exceeds 5000 MJ/m2 and with a yearly sunshine time of more than 2200 hours. Because of the huge potential solar resources, it is possible to increase the installed capacity of solar photovoltaic power plants from 174 GW to the required 2,500 GW by 2050, and to install more and obtain more solar-generated electricity on a per-installation basis. For wind power, in areas of China where wind resources exceed 300W/m2, the total available onshore wind energy reserves at 100 metres height are about 3400GW. In the sea area with a depth of water of 5-50 metres, the total amount of offshore wind energy resources at the height of 100 metres has reached 500 GW. Enough to support the growth of installed wind power plants from 184GW today to 2400GW in 2050.

However, what remains unpredictable is solar energy and wind energy have intermittent characteristics, and their available resources during the day and night are greatly affected by the weather and uncertainties. To make better use of energy supply, supported by a report from ETC &RMI (2019), It introduces the concept of renewed energy integrated into the grid system. This process must combine energy storage with high flexibility to resolve the contradiction between peak power demand and power supply shortage during this use period. (Graph 2) The contribution of Xie Liu L. et al. (2021) shows the impact of Ultra-high voltage transmission systems on energy integration. This gives us a good explanation of the series of guidelines proposed by the State Grid for ultra-high-voltage projects (State Grid Corporation of China,2021). The project has been proposed to illustrate the total investment in grid connection and transmission projects for new energy

sources, meeting the demand of 1,161 centralised and 420,000 distributed new energy generation projects to be connected to the grid to generate 310 million kilowatts of new energy.



Graph 2. Daily balance of power system in winter

B. Challenge forecasting

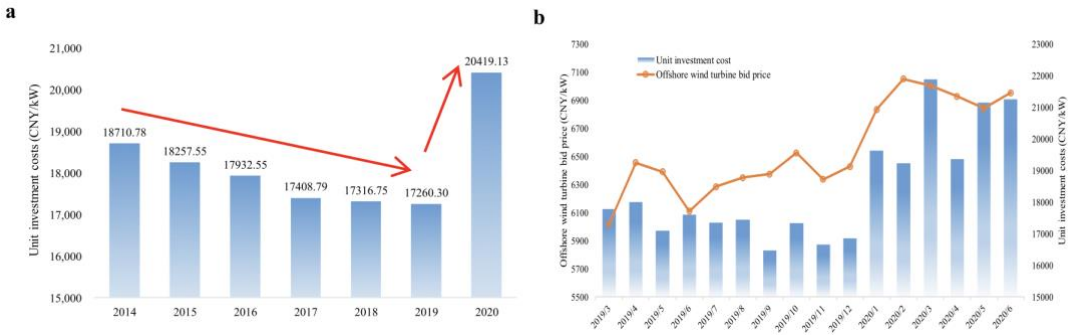
Pandemic blockades have severely hindered the use of renewable energy sources worldwide. Disruptions of the supply chain and non-essential shutdowns of power generation activities have led to delays in implementing renewable energy projects. By 2020, solar and wind power generation is forecast to decline by 8% and 12%, respectively, and large power plants are expected to close. Thus, energy companies will have to redirect their activities, cancel new investment projects, cut budgets, and review project prioritisation and implementation. In addition to the supply chain delays, the connection of new renewable energy projects to the grid is delayed as distribution system operators postpone non-critical works (Yao, Y. et al., 2021).

Tu, Q. et al (2019) investigates profitability of solar PV and onshore wind project by using the concepts of LCOE (Levelized Cost of electricity) and FIT (feed-in tariff) which is a new energy subsidy policy by the government to encourage investment in new energy sectors and the subsidy capital will be reduced gradually to push companies to make innovation. The LCOE for the projects under observation is counted based on actual grid-connected generation with a baseline FIT level of USD 8/kWh. As the result shows, The LCOE of PV projects is higher than the same figure for onshore wind projects, which

shows that PV projects could have potentially reduced costs in the long term; It also shows that the rate of return for onshore wind projects is 95.43% and for PV projects 80.43% which means it is enough to cover the generation costs of most onshore wind and PV projects undercurrent baseline figure. If the baseline FIT level is reduced to a low point, onshore wind investments will become unprofitable; in the case of PV, about 26.81% of projects will still be profitable.

This paper also has analyses on various new energy sources. Onshore PV and wind projects will drop in cost during the long term with cumulative installed capacity. However, other new energy sources, such as hydro and bioenergy, capacity growth will not be viewed favourably because costs have not fallen significantly, and they are lagging learning trends. From 2010 to 2018, the LCOE increased rather than decreased.

On the other hand, things, such as limited land for construction, and lack of flexibility become disadvantages of onshore wind power. Offshore wind power has benefits due to its significant advantage on distance from land and proximity to energy supply centres. The scale of economic and technological advances has vastly reduced the cost of investment. But due to covid, in late 2019, It affected the wind power industry chain, delayed the construction of offshore wind projects because quarantine policy restricts the free movement of workers and uncertainty about future cash flows, demand, and budgets. Those factors further reflect the lack of supply and capacity of offshore wind in China. (Graph3) (Zhang, D. et al., 2017).



Graph3. The investment costs of offshore wind power from 2014 to 2020

The previous study shows the profitability may deteriorate further in the near term. Tu, Q et al. (2021) give a more perceived view on the influence by investigating the LCOE of

offshore wind projects, In 2019, 20 projects have production costs below the FIT (0.75 $/kWh), which means that most projects are profitable, but when the COVID-19 pandemic began in 2020, Of the 19 projects implemented, three expect to have production costs below the FIT, which means only 16% still have benefits.

C. Some innovative approaches to investing

This section will describe how individuals and small businesses can participate in green energy investments. Community shared renewable energy projects are a novel investment model (Zheng R. et al., 2015). The solar power generated by a solar farm is not consumed by the owner. The electricity will be sold to the electric company and then returned money to the owner based on the amount he contributes to electric generation. The conclusion of this literature is based on a game theory analysis that through crowdfunding, the average cost is lower than the overall sales price. As a result, power companies also save on procurement costs.

Another way to invest (Ottinger, R., & Bowie, J.,2014) is to invest in community distribution infrastructure and mini grid planning expansions, such as renewable energy projects for hospitals, military facilities, schools, villages councils, and community centres. The benefit of this program is that an expanding community is likely to consume more energy due to population changes. Renewable energy sources drive grid technologies development to balance the energy supply. Energy storage mechanisms constitute a significant research and development focus within this project which is worth developing.

Contracted roofs and leased roofs to build photovoltaic power plant models are in this literature (Hayat, M. A., 2018). The higher the price of electricity in the region, the higher the benefits of photovoltaic power generation. Photovoltaic power generation can offset the high cost of electricity expenditure. The power station owner can be sold at a slightly lower price than the market price to nearby users of electricity to obtain revenue. Of course, the non-exhaustible electricity can also be sold to the grid under the guide price. To sum up, controlling the cost and increasing the proportion of commercial self-use can improve the investor's profit.

Andoni, M. et al. (2020) provide a realistic case of grid investment in the UK where private investors have installed transmission lines between sustainable energy generators and demand sites to pursue their interests and provide paid access to generators. The literature uses a two-level Stackelberg-Cournot game to study the strategic investment decisions that investors need to make to maximise profits in renewable energy generation, energy storage, and grid improvements. Like this example is the UK grid reinforcement project (Andoni, M., & Robu, V.,2016) played the same personal roles to determine output generation capacity and profits. The literature can conclude that introducing energy storage with grid improvement can reduce restrictions on renewables and allow for more integration, with investors receiving more revenue from warehouses and local power producers from trading surplus energy. Energy storage can increase the deployment of renewable generation and enable greater penetration of renewable generation by increasing generation capacity and reducing the demand for other energy sources in the grid.

The stock market is also a good way of funding renewable energy projects. Investors who invest can show their social responsibility while also receiving stable and solid returns. Renewable energy companies raise funds through public trading, and transparent listing principles allow investors to receive adequate financial information on prices, market capitalization, shares, and securities issued. Also, green companies could have a bigger capacity to finance special projects to expand their markets. (Ottinger, R. et al., 2014)

The following papers (He, L. et al., 2019) focuses on green credit. Banks offer them financial services to encourage borrowers to achieve sustainable development and make green investments. It’s a good way for companies to finance with green credit, leading to significant risk reduction in the preliminary stage, operation process, and controlling. It has also encouraged the development of wind and solar energy—analysis of the threshold effect on economic growth in relation to firm size. The study found that renewable energy investments by large firms contribute less to green economic development than investments by medium-sized, small, and micro firms. Because small and medium-sized enterprises are more competitive and seek to increase their size and market share. As a result, they pursue more aggressive business strategies than larger

firms and rely on high-risk investment vehicles investments to improve their economic performance.

D. Decision-making on investments

In a challenging environment, green investment is becoming increasingly important to support and accelerate environmental improvements (He, L., 2019) to identify the drivers of green investment, and this literature uses mixed analysis. However, in terms of provinces scales, the government has gradually expanded its authority in setting and monitoring environmental regulations. The secondary impact of policy factors is more pronounced than the direct impact.

Using micro-level data, Du, H. S. et al. (2019) found a positive relationship between firm performance and green investments. The financial performance of the firm improved significantly in the third year due to investments in energy efficiency and emission reduction. In addition, green taxes, government subsidies, and technological innovation had varying degrees of optimising impact on the financial performance of green investments, with the most substantial impact on long-term performance. The results suggest that companies should consider environmental investments as a long-term strategy.

After literature review, the fact that a vast potential market of solar and wind energy is illustrated. The concept of energy storage and Ultra-high voltage projects has been introduced to show the problem of unevenness in time and region of electricity generated. At the same time, some challenges should be considered while selecting a project. On the one hand, impacted by the pandemic, some projects can’t function normally due to disruptions of the supply chain and the shutdown of the non-essential projects. Offshore wind power especially got considerable affection. On the other hand, the Profitability of PV and wind power generation projects is highly dependent on government subsidies. The cost of PV and wind power generation projects decreases while installation capacity increases. Some Innovation Approach has been illustrated such as individuals in a community could cooperate to build solar farm to generate profit by selling electricity to electricity companies; Investment regard to new energy infrastructure in bigger communities; Contracted roofs, leased roofs to build PV power plants; Construction of transmission lines between energy demand sites and energy

generators while providing their paid access; Stock Market; Green credit for the small or micro company to fund capital. Lastly, Strong relation between green investment and performance. The important role of green taxes, government subsidies, authority, and technological innovation had a positive impact on the long-term financial performance.

The present of this paper argues for individuals or small companies. As they don't have much knowledge and experience in the energy sector, this paper should provide them step by step instruction, in a straightforward and compressive way, to show how they can start their investment.

V. Research Questions

What practical ways for an individual or small company to invest in the new energy industry?

Hypothesis:

1. It's not applicable for individuals to build transmission lines between energy demand sites and energy generators or cooperate with solar farm owners to generate profit by selling electricity to companies since the state mainly controls the electricity sector.
2. Stock Market, Green credit for small or micro-companies to fund capital and Invest infrastructure in more prominent communities could work as a feasible way to approach. It will be better to choose projects with long-term benefits.

VI. Methodology

The previous literature research provides support for a large amount of data in the carbon-neutral field. For individuals or small businesses, how to obtain and analyse professional information, and choosing the suitable business model are practical issues to be discussed. The most direct way to solve these problems is to consult professionals-some experts in the field of new energy.

To gain a better insight into the possibilities for investment in practical terms, semi-structured interviews were conducted with 3 influencers in the Little Red Book (a social media and e-commerce platform). It has been described as "China's answer to Instagram". An influencer is defined as someone who is dedicated in the field of carbon neutrality or environmental related subject for more than 10 years and serialised more than 30 videos or texts in its primary social media. The main serial content (over 70%) is carbon neutrality and its news. Interviews were conducted via the zoom and lasted approximately 30 minutes each. Answers were recorded by audios.

This paper will fulfil the gap by conducting interviews of three experts in the new energy field regarding:

1. Interpretation of economic work conferences, views on new policies
2. Speculation on areas concluded from literature review
3. Employment approach in real practice in China.
4. Steps to follow when invest company or build business
5. Information to pay attention to while analysing the company’s situation
6. Optimization fund portfolios for small companies

Interviews were transcribed, and analysis was conducted to let people avoid unnecessary effort and time risk based on the experience of relevant practitioners. And pay attention to the report in the document worthy of study and be able to determine the direction of the investor and the appropriate business model.

Semi-structured interviews often produce uncertain results outside the scope of the objective. So, it’s vital to design targeted questions and filter non-related answers. This interview provides a deeper understanding of participants’ perceptions of motions related to carbon neutrality. The author reviewed each answer to understand the

participants' perceptions and provided information, such as if it is valuable and applicable for individual and small companies.

Designed Questions:

1. **Could you have a brief introduction of yourself?**
    - *Name*
    - *Gender*
    - *Position*
2. **Could you talk about the current company you are dedicating to? or any of the companies you think it's worth mentioning?**
3. **What's your definition of carbon neutrality?**
4. **Which fields are worth investing in?**
    - *By giving the results of literature review (new energy (Photovoltaics, Wind power)), electricity grid(Ultra high voltage power transmission, infrastructure) and energy storage)*
5. **Do you suggest individuals and small businesses to invest?**
    - *If the answer is Yes < jump to question 6*
    - *If the answer is No < ask for reasons*
6. **What advice would you give to people who want to invest in this field?**
    - *How and where to find information?*
    - *How to analyse*
    - *Figures to pay attention*
7. **For small businesses, how do you get funds related to green energy?**
    - *To check the green credit is a good idea or not.*
8. **What do you think about the relationship between government policies and subsidies and a company's performance?**
    - Check the impact of environmental taxes, government subsidies, and authority on long-term financial performance.

The author should observe the result to check if their answer is equal or different, if they have other answers, another person should be interviewed to validate results.

After having the result of the interview, to have a more comprehensive result, the point of view of the normal people should be considered. Therefore, the authors need to collect a survey to obtain the tendency of people's attitudes towards the field of carbon neutrality. The purpose of this survey is twofold. (**Appendix A)**

1. To obtain the level of recognition of individual investment opportunities in the carbon neutrality field.
2. To obtain information on people's perceptions of low-carbon lifestyles in food, clothing, housing, and transportation.

This survey will be published in WeChat.

VII. Empirical Work

A. Interviews Conclusion and Analysis

This paper used qualitative and quantitative research methods, by combining interviews with three experts from the carbon neutrality field and a well conducting survey and 73 of the results were successfully recalled.

For the interview section, this paper will use a content analysis method, categorise, and analyse the interview content. At the end, a conclusion will be conducted.

To find three experts in the field of carbon neutrality and to ask them to agree to an interview, the author searched for carbon neutral topics and found four new media bloggers who are in the growth stage. Three of them finally agreed to the author's interview invitation. Their names are Jia Hu, Haowen Chen, and Sunche Cao. They have 2.300, 1.064 and 11.2k followers in red book respectively, and by studying the content of their channels, the author learned that their research and knowledge in the field of carbon neutrality has a different focus. Therefore, the interview questions were changed slightly to make it easier for the interviewees to understand the entry point of the question. The following is a description of the three interviewees and their background.

Jia Hu has been working in the energy industry for more than 15 years and is now doing strategic consulting work for the largest energy group in New Zealand. (Hu, J. Personal communication, May 4, 2022) (Appendix B) Their business is mainly about oil and gas extraction, power station construction, energy retailing, and some other branches which offer investment services. In New Zealand, the government is very concerned about carbon emission reduction and has introduced many related mechanisms, including carbon emission price and carbon trading market, to promote some high carbon emission companies to transform or reduce their carbon emission. Their company's economic activities release a large amount of carbon dioxide, which is the government's No. 1 watch list. He has abundant knowledge as his company must consider all government requirements which are tied to the operation and profitability of the company, including the use of the world's most advanced carbon storage

technologies, energy-saving and emission reduction technologies… Therefore, the author will focus the interview on investing in energy systems.

The interview with Hao Wen Chen will focus on the employment opportunities of individuals. (Chen, H. Personal communication, May 7, 2022) (Appendix C) She is an alumnus of Department of Environmental Science and Engineering, Fudan University (Shanghai) and MBA programme of KEDGE Business School (Paris). She is the Director of Sustainability Consulting at Guangzhou Bay Area Carbon Neutral Management Consulting Co. She is also an independent consultant and contributor. She is a deep-rooted carbon practitioner in the agricultural sector, so she has a lot of knowledge about the industry chain of agricultural carbon neutrality. Her current work is mainly about carbon neutral training for companies, carbon-neutral related education for individuals, and personal career development planning. Recently, she has been receiving a lot of requests for career planning from college students who will be graduating within two years.

Sunche Cao studied economics at Beijing Jiao tong University and George Mason University in the United States and environmental economics at Duke University as a graduate student. (Cao, S. personal communication, May 10, 2022) (Appendix D) After that, she came back to Beijing to work in the research institute of a state-owned enterprise doing energy saving and environmental protection related research. Her work is mainly about providing the government with research data to make decisions and is related to carbon peaking and carbon neutrality. Corresponding planning and research, she helps the government to settle the way to promote this industry, the measures, the goals, the key tasks as well as some supporting research and project studies... So, her interview will be more on policy summary, job search channels, data support in the field of carbon neutral investment.

First written in front, all three experts agreed on this in China, and in the world. Government carbon policies have a huge impact on the carbon neutral sector. The Western countries are very forward-looking in terms of carbon emissions and carbon trading markets, and some high carbon emitting companies receive a large degree of restraint. China has been criticised for its environmental problems for a long time, and in the past decade, there were so few people who were willing to take the first step because the various sectors were constrained by each other. In recent years, the Chinese government has proposed carbon neutral targets and programs. Unlike the

Western countries, where the changes of different regimes and parties result in the application of policies with too many variables, Chinese style of policies always result in a more consistent, permanent, and certain implementation. Fewer variables are good for investors or job seekers, reducing the possibility of wasting time and money. So, for the next five to ten years, the field of carbon neutrality will grow.

The summary of the interview will be divided into three parts, the first is employment opportunities for individuals, the second is the investment opportunities for individual investors and small companies, and the third is how to participate in carbon neutrality to achieve personal and corporate transformation.

Employment opportunities for individual

The three experts recognized the investment opportunities and job opportunities presented by the new clean energy industry in the literature review section. However, for individuals, they all suggested that they could combine carbon neutrality with the field they are more familiar with to find viable growth in their career. Sunzhe gave an example in Legal professionals. In addition to the traditional civil service, law firms. People can also work on government environmental and climate legislation, environmental public interest litigation, carbon neutral legal news and media dissemination…As well as people in the field of architecture can also be engaged in, for example, landscape architects, building energy efficiency engineers, or green building materials research and development engineers…

In the interview with Jia, he talked about enterprises' transformation which directly have consequences on employment. The green transformation of small and medium-sized enterprises will penetrate people's daily life in clothing, food, housing, and transportation. The production of new products will generate new job opportunities. Especially in the manufacturing industry. For example, more environmentally friendly and low-carbon packaging design, organic and low-carbon generated food material, and the carbon reduction of buildings, the tendency to choose electric cars can bring more demand…

The three experts all emphasised the key role of the new energy industry in the field of employment, with new energy as the most important alternative to the energy structure and a grip for energy efficiency improvement. As Hao Wen, she emphasises that traditional coal power generation companies will have fewer and fewer jobs, and talent

and personnel will move to new energy sources because of the benefit of efficiency improvements and reduction of carbon emission. China is the largest market for greenhouse gas trading in electricity, which will later be extended to other areas as well.

In addition, Haowen emphasised the employment opportunities in the field of education, such as corporate training (the improving knowledge in the field of carbon neutrality), training of talents in universities related to carbon neutrality and carbon peaking and construction of teaching systems.

Investment opportunities for individual investors

In the interview with Hu Jia, he gave a very step by step instruction that in China, if an investor wants to invest in the carbon- neutral sector, he should first understand the macro environment and the worldwide trend. Secondly, the trend in China, so that investors know the general favourable direction in the future. Because the Chinese style of polices is always consistent in its support for some areas. The first place to start is with government planning, such as the 12th Five-Year Plan… Investors can get information on which areas of emission reduction or transformation the government will make investments. The investor should select the industry, choose the area he is familiar with, and then get some ideas based on his background knowledge or through online banking, friends who work in the investment field, or get the analysis report of the securities company. To learn about which companies and enterprises in the industry can be studied from or acquired. Then, based on these analyses, people can decide about whether to invest directly or buy in stocks, which company to choose, or whether to invest in a business by themselves.

In this section, Sun Zhe mentions that individuals can participate in carbon neutral investments by participating in the carbon trading market. She said that investors in the carbon trading market need to understand national policies, energy prices, background of carbon trading in different industries, etc., which requires a high comprehensive ability of investors. As the national carbon market incorporates more trading industries, the future direction of the local carbon market is very uncertain, and the policies and regulations will have a greater impact, so investors are advised to operate with caution.

In the interview with hao wen she also suggested that in the current situation is not a very appropriate time for individual investors. She suggested that individuals can get more points by participating in The Carbon Generalised System of Preferences (GSP)(an incentive mechanism for citizens to value their energy conservation and carbon reduction), starting from themselves, using green transportation, such as riding shared bikes or taking more subways and driving less private cars, and then it is possible to convert their points into personal carbon credits.

Investment opportunities for small companies

For companies, said by Jia, investment fields where they can get carbon products will be of great interest. Because of the impact of the carbon tax (China is in the experimental stage and only a few regions have implemented the carbon tax), the cost of operation will increase, and some companies change their business to maintain profitability, for example, from oil extraction to clean energy. Another alternative is to deduce the impact of carbon emission, for example, tree planting to get the amount of CO2 emissions quotas by the age and size of the tree. The lower cost gives companies an incentive to start reforestation. There are now afforestation funds that make direct investments in forestry companies, while third parties can charge management fees.

The government will have funds to support large entrepreneurial competitions every year, for example, a project from a team, who come up with a proposal and a plan to find investment. If they win, they will get a prize and start-up capital. It is especially suitable for college students, and some people make their business by teaching how to write business plans and how to make it more attractive to investors.

Talking about how to fund the company, Hu Jia said finding equity investment opportunities for small companies is greatly dependent on their familiarity with the capital markets. He also gave very specific instructions for companies in different stages. In the case of companies without capital generally need to find angel investors, venture capitalists as the first round of financing objects; when the company reaches a certain scale, they have a certain number of profits. They can acquire investment funds by conveying some private investors to invest. When the company reaches a large scale, it can cooperate with relatively large private equity or investment personnel. He added, Financing is a business of the capital market. Investors are different from the government which will support people because they are willing to innovate and make

change. Investors must see the profitability of the business they want to invest in before they are willing to invest. If the business is not profitable, it will be hard to get invested.

Hao Wen gave her answer regarding Green Credit that nowadays, it is easier to get capital for digital companies and those who have core technology advantages in emission reduction technology with a professional team. In the context of achieving carbon peaking by 2030 and carbon neutrality by 2060, there is not much time for Chinese companies to achieve the transition. Therefore, the Chinese government supports the development and application of new technologies for individuals or institutions and awards them with patents. This includes the use of new materials in the bioeconomy, as stated in the 14th Five-Year Plan of the NDRC, which emphasises the degradation of plastics and the use of alternatives to plastics. Under this policy, we can already see that some new enterprises have made relevant developments.

China's policy-led approach to carbon neutrality will continue for many years. Said Hao Wen, the cost of energy transition or emission reduction for enterprises is huge. The market system that is building in response to the policy, and the training of talents need the resources provided by the state. With the further development of China's carbon trading market, it will also bring positive assets to companies. But most of them are enterprises with the technology to reduce emissions, or those that can create emissions reduction benefits. The fact that the state has not yet adopted an official carbon price is left to the market some time, whether it is a research institution or an individual to innovate regarding this industry.

In terms of international cooperation, in the field of carbon product trading, there have been some examples of Sino-foreign cooperation. The carbon product market is more mature in Western countries. But China's carbon market has a large volume of transactions, which will bring a lot of capital and opportunities.

How people can participate in carbon neutrality to achieve personal and corporate transformation

Hao Wen said people should be given more options for product information regarding the carbon footprint of the entire production chain and life cycle of the product, so that they can choose more environmentally friendly products when they consume them. She believes this method will help the ecological environment a lot. For example,

Mengniu's (agricultural products), their beverages and milk are certified as carbon neutral…

She also suggests that individuals can improve their knowledge in the field of carbon neutrality by doing some training and reading books.

1. Fudan University's Dual Carbon and Sustainable Development training (universal training) Many professors are invited to share policy trends and expert insight. From perspectives, such as chemical, water, sustainable development, human resource development and talent development…

2. Carbon Emissions Trader Training at the Environmental Energy Exchange. Training for individuals in related fields, such as consulting or professional services in the financial, emission reduction, and technology industries… Participants will learn some practical, macro, and financial basics knowledge. (The definition of carbon neutrality, the logic of carbon trading, the process, the methodologies needed, the way to engage and to trade in the carbon market.)

3. Training in supply chain or strategic positions within the company. This training course is designed for people who work as an executive or professional manager within the company, which can help the company to set carbon neutral goals and a path map to achieve them. She recommends the BCG course (based on the baseline inventory, scopes 1-3), where participants learn how to specify goals and how to work together between departments to achieve the transformation within the company.

Books

1. Wang Jun's The Age of Carbon Neutrality (introductory level)

2. Bill Gates' How to avoid a climate disaster (introductory level)

3. BSG's General Guide to Carbon Neutrality in China, with 7 key sectors (a practical tool for corporate practitioners or consulting practitioners at the strategic level)

4. CSR Theory and Practice by Guo Peiyuan, General Manager of Business Road. For those who are engaged in corporate sustainability and ESG-related work.

She also recommends that professional managers with many years of experience in the workplace, or those working in the consulting or financial sector, could participate in

the online program in a prestigious foreign program. They need not only a basic understanding, but they also need advanced knowledge in sustainability.

The last question in the interview with Sun Zhe was about the attitude of Chinese people living in China towards being green. She said the current situation is quite divisive. Some people, especially young people, are very much in favour of doing something to protect the environment. At the same time, there are some people who, because of the current bad economic situation, do not have their basic needs met. They are completely out of ideas about protecting the environment. She believes that the cost of environmental protection should come down. For individuals, they do not need too much consideration, or spend too much money, and then people can help with environmental protection. If the green premium is too high, people will feel very reluctant. To provide low-cost environmentally friendly products, companies need to innovate.

Jia said in the interview that most followers and viewers of his social media are young people, while in his understanding, it is the middle-aged who need to pay more attention to corporate transformation. This is because they will be more able to be affected by the layoff's crisis during the transition of a business.

Using blockchain technology in the carbon neutrality field, said by Jia, due to decentralisation, the owner of the data is no longer a company, but individuals, individuals can also sell excess data to other users, rather than sell to enterprises. This creates a brand-new market; this market is still extremely elementary. In the future, while more development in the metaverse and other digital products, more usage and opportunities will be developed.

B. Survey Analysis

This paper will use descriptive analysis for the 74 surveys regarding to People's investment and employment tendencies in environmental protection industries.

SECTION 1 Level of recognition of individual investment opportunities in the carbon neutrality field

To investigate the first purpose for obtaining the level of recognition of individual investment opportunities in the carbon neutrality field. In this paper, age (2) in the basic information section is used as variables to compare with the answers to 3 questions (6.8.10) in the second section of the survey.

According to the survey, 28.4% of the participants in this survey were students, and 81.8% of them are not working, only 3 of them are working. Thus, annual income will not be used as a variable.

By taking a cross-sectional analysis, the age of the participants in the interviews was divided into two parts, 18-30 years old younger age group and 30-51 years old and above older age group.

There is a strong association between **age and knowledge of carbon neutral related carbon reduction industries and related policies**. Among the younger group, 18 people answered that they had some general knowledge, 18 people knew a little, and 10 people did not know at all, accounting for 39.1%, 39.1%, and 21.7% of the group, respectively. In the older group, 10 respondents had some general knowledge, 18 respondents had some knowledge, and no respondents had no knowledge, accounting for 35.7%, 64.3%, and 0% of the group, respectively.

N.people/ %	Very well understood	Have a general understanding	Know a little	Don't know at all
Younger age group	0	18 people (39.1%)	18 people (39.1%)	10 people (21.7%)
Older age group	0	10 people (35.7%)	18 people (39.1%)	0

This result indicates that the older group has more knowledge about the basics of the carbon neutral industry.

There is a relationship between th**e interviewees' age and their willingness to buy shares of more environmentally friendly companies**.19 people in the younger group

answered yes, and six people felt indifferent, accounting for 41.3% and 13% of people who invest in stock in the age group, respectively. In the older group, 13 people answered yes and 5 people felt indifferent, accounting for 46.4% and 17.8% of the group, respectively.

N.people/ %	I don't invest in stocks market	Yes	It doesn't matter to me
Younger age group	21 (45.7%)	19 people (41.3%)	6 people (13%)
Older age group	10 people (35.8%)	13 people (46.4%)	5 people (17.8%)

This result indicates that the older group is slightly more involved in the stock market and has a slightly higher propensity to invest in more environmentally friendly companies.

The results are striking in terms of **age and willingness to enter the carbon neutral industry at this stage**. In the younger group, 19 people answered I would like to, 22 people said they would like to consider it in the future, and 5 people said I would not consider it, accounting for 41.3%, 47.8%, and 10.9% of the group, respectively. In contrast, 18 of the older group answered I would like to, 7 would consider in the future, and 3 would not consider, accounting for 64.3%, 25%, and 10.7% of the group, respectively.

N.people/ %	I am willing to	I will consider in the future	I am not considering
Younger age group	19 people (41.3%)	22 people (47.8%)	5 people (10.9%)

Older age group	18 people (64.3%)	7 people (25%)	3 people (10.7%)

The authors' original hypothesis was that the younger group would be more interested in working in the carbon neutral field because it is a relatively new industry. Surprisingly, the older group was more certain about working in the carbon-neutral field, probably because they thought it would be a better fit with their own field.

SECTION 2 Comparison between participants career fields and carbon neutrality fields and inclination of carbon neutrality field

Then those career fields except students will be compared with question (7) to find out **possible connections between the field of carbon neutrality with their current field**.

In this survey, the largest number of participants were 11 from the education industry, 7 from the information technology industry, and 7 from entrepreneurs. In terms of the total number of participants, 45 people (60.8%) believe that low carbon and sustainable development has brought many opportunities for personal and business transformation. The number of people who believe that the implementation of carbon reduction projects has reduced the profitability of companies and that many jobs have been greatly impacted is 22 (7%). The number of people who think it may be possible in the future but do not see it yet is 27 (36.5%). This result proves that the majority of people who combine their profession with the carbon neutral field have a positive impact, while a few have a negative impact. Because of the small sample size of this survey, it is not possible to draw a relationship between specific industries and the impact of the carbon neutrality process.

Among the opportunities in the field of carbon neutrality, the inclination of the participants can be seen in the green finance that 31 of people accounted for 41.9%, work in new energy related companies have 21 people accounted for 28.4% and helping companies to achieve a green transformation to get better investments have 16 people accounted for 21.6%. Here it can be seen that these three fields are most

favoured by them. And it is worth noting that except for the field of research on carbon reduction technologies, where only 6 people accounted for 8.1%, all other fields had about 15% or more of the selected number. From this, the authors infer that the investable areas of the options are implementable, which in turn confirms the experts' speculation about investment and employment opportunities in those areas.

SECTION 3 Information on people's perceptions of low-carbon lifestyles in food, clothing, housing, and transportation

For investigate the first purpose for obtaining information on people's perceptions of low-carbon lifestyles in food, clothing, housing and transportation. In this paper, gender(1), age (2) in the basic information section are used as variables to compare with the answers to 3 questions (11.12.13) in the last section of the survey.

With variable gender

To analyse the relationship between **gender and the preference of using more green modes of daily travel**, the authors divided the main modes of travel into self-driving and cab, and others. Five males, or 24% of that gender, used self-driving cars and cabs as their main mode of transportation. While 6 females, or 11.3% of that gender. The results show that males prefer to travel via self-driving cars and cabs than females.

To analyse the relationship between **gender and the willingness to buy more expensive green products**. The number of men who answered yes was 15, or 71.4% of that gender, while the number of women was 49, or 92.5% of that gender. This result shows that women are more willing to spend a little more money to buy green products.

To analyse the relationship between **gender and whether to buy willing to choose to buy a new energy vehicle because it is more friendly to the environment**. The number of men who answered that they could consider it, which is a consideration when they choose a car, was 13, or 62% of that gender, while the number of women was 39, or 73.6% of that gender. The number of men who answered that they would not is 4 or 19%, and the number of women who answered that they would not is 3 or 5.6%. The number of men who are not currently considering buying a car is 4, or 19%, while 11 women are 20.8%.

N.people/ %	Yes, this is one of the factors I would consider when shopping	No	Not currently considering buying a car
Men	13 people (62%)	4 people (19%)	4 people (19%)
Woman	39 people (73.6%)	3 people (5.6 %)	11 people (20.8%)

From this cross-tabulation analysis, women will consider environmental factors more than men when purchasing vehicles.

With variable age

By taking a cross-sectional analysis, the age of the participants in the interviews was divided into two parts, 18-30 years old younger age group and 30-51 years old and above older age group.

To analyse the relationship between **age and the preference of using more green modes of daily travel**, the authors divided the main modes of travel into self-driving and cab, and others. 10 people, or 22.2% of the young age group, used self-driving cars and cabs as their main mode of transportation. While 12 people, or 46.2% of the older group. The results show that the older people prefer to travel via self-driving cars and cabs than the younger people.

To examine the relationship between **age and willingness to purchase slightly more expensive environmentally friendly goods**, 38 young people, or 86% of that age group, were willing to purchase green products, while 26 older people, or 92.9% of that age group, were willing to do so. Therefore, it can be concluded that people are generally willing to spend a little more money to support the purchase of greener foods, while the older group will be more supportive.

Age group/ Answers	Yes	No
The younger age group	38 (86%)	8 (14%)
The older age group	26 (92.9%)	2 (7.1%)

In order to examine the relationship between **age and whether new energy vehicles are purchased because they are friendlier to the environment.**

Age group/ Answers	Yes, this is one of the factors I would consider when shopping	No	Not currently considering buying a car
The younger age group(46)	31 people (67.4%)	4 people (8.7%)	11 people (23.9%)
The older age group(28)	21people (75%)	3 people (10.7%)	4 people (14.3%)

Therefore, it can be concluded that older people have a greater need to buy cars. And they are more likely to pay attention to and consider environmentally friendly factors

VIII. Results

It is clear from the interviews with the three experts: because of the high cost of transition for companies, at this stage, the field of carbon neutrality in China is predominantly policy oriented. Experts suggest individuals and companies to transform by combining with the carbon neutral field based on their own familiar fields. Carbon-neutral technology and innovation is very well-supported and has the good potential to generate profits.

The profitability and employment opportunities in traditional high-polluting industries will diminish and talent will shift to more efficient and cleaner fields. Although the transition process can be difficult for society and companies for the huge input at the initial stage, the process can be helped by applying for subsidies such as green credit and investment from the state… For different stages of a company, experts recommend going through different sources of funding. In addition to corporate transformation, traditional high-emitting companies can also maintain profitability by reducing the impact of carbon emissions, such as planting trees to increase carbon products which get the amount of allowable emissions at a lower cost. Companies can also participate in competitions by improving their innovation and technological capabilities and receive appropriate funding and state subsidies.

For individuals, they can improve themselves and better participate in this field by participating in some carbon-neutral related courses or reading some related books. Individuals who have deep research on this industry can also participate in carbon neutral investments by participating in the carbon trading market. Everyone should start with themselves and help society transition to a more low-carbon and environmentally friendly direction through their own behaviour. Based on the large volume of the carbon trading market in China, international collaboration is also a good direction for the carbon trading market. Technologies such as blockchain are not particularly mature now, but there is also a great prospect for development afterwards.

From the individual survey, we can see that older people generally have better basic knowledge of the carbon neutral sector than younger people and prefer investing in the stock market and green companies and are more committed to a future career in the carbon neutral sector than younger people.

Most of them think that the carbon neutral field can be combined with their current career field, which can make them better developed. Green finance, the new energy industry, and the company transformation process are the most preferred fields in the carbon neutral field survey. Most job opportunities in new energy fields have a selection rate of more than about 15%. Thus, also validating the conclusions of the experts and the literature review.

In terms of daily life, the tendency is that men are more likely than women to use cars or cabs, which are less clean means of transportation. Women, on the other hand, are more likely to spend a little more money on green food and to buy environmentally friendly cars. When age was used as a variable, the authors found that older people were more likely to use cars or cabs as less clean means of transportation. But they would be willing to spend a little more money on greener food and on more environmentally friendly cars.

IX. Discussion

As stated in the literature review by Reinventing Energy Group (2016), ETC & RMI (2019), the electrification of the Chinese market will increase significantly in the future and the share of electricity generated by new energy sources will increase. This will be accompanied by the construction of a large amount of solar and wind power generation infrastructure. Also, China is very rich in solar and wind energy resources. The three experts confirmed that China has great potential for new energy sources and energy storage and promising the prospects for employment and investment. However, the UHV project described in the article by Xie Liu L. et al. (2021) was not mentioned by the experts, because the UHV project is a state-built project, which is difficult for ordinary people or companies to participate in.

Because of Covid-19, China's economy has taken some hits, and industrial transformation requires a lot of economic support. From Jia's interview, it is confirmed in the literature review challenge section (Yao, Y. et al., 2021) that some new energy-related projects were greatly affected due to the restriction of Covid-19. For example, workers are not able to travel easily, and a lack of supply and capacity finally causes systemic risk in the financial markets which affect related projects a lot. Tu, Q. et al (2019) also prove that after the pandemic most of the projects lost their profitability. In the interview, Jia also mentioned that not only the new energy sector, but also the Chinese economy has been greatly affected after the epidemic, but now there are many Sino-foreign collaborative projects, and because of the large size of the Chinese carbon trading related market, there are still opportunities and potential for developing. This point is also recognized by Haowen.

From the result of the interview, we can see the urgent need for China to achieve a carbon neutrality goal and limit carbon emission which needs help from the government. Tu, Q. et al (2019) state the relationship between the profitability of solar power and wind power projects and government subsidies. The three experts conclude that the current general environment for carbon neutral companies depends largely on the policies of the Chinese government. As the expert Hao-Wen stated that at this stage for the relevant companies is more input than revenue, the infrastructure building phase is quite difficult for the companies, as well as Hu Jia, he stated that the state

subsidies for the projects are conducive to promoting innovation, but at this early stage, the relevant projects are still very dependent on government subsidies, and it is difficult to maintain high profitability in the absence of government subsidies.

This is consistent with the literature review in which the government has gradually expanded its power to make and monitor environmental regulations and environmental taxes (He, L., 2019). And government subsidies had a positive impact on the financial performance stronger in the long term performance (Du, H. S. et al. ,2019) , the experts predict that the energy sector will be well-developed in the long term. Research in the field of technology and carbon reduction technology innovation is promising as mentioned by Tu, Q. et al (2019) and worthwhile for individuals and small companies to pay more attention.

In addition, there are several possible ways for individual and small companies to participate. Zheng R. et al., (2015) ,Hayat, M. A., (2018), Andoni, M. et al. (2020) and Andoni, M., & Robu, V.(,2016), which were mentioned in the literature review, and the investment approach of building their own grids and solar plants and partnering with power-related companies, as well as the investment approach of establishing community grids and energy storage by Ottinger, R. et al., (2014), were not mentioned by experts, This may be due to the fact that many power grids in China are built with government investment, and what works in other countries may not be a good approach in China, while experts suggest that it would be better to start from an area that is familiar to them.

The purchase of related stocks by individuals (Ottinger, R. et al., 2014) and the participation of small companies in green credit (He, L. et al., 2019) were confirmed by Jia that green credit financing can help reduce the risks in the operation of companies and help the development of the new energy sector. He states that investment in this area is largely determined by the investor's knowledge of the financial sector and that it is important to choose a familiar field while being well informed. Jia adds some information to the literature that companies of different sizes and profitability can choose different methods to raise funds based on the He, L. et al., (2019) investigated that small and medium-sized companies are more competitive in green project investments compared to large companies. Because of the smaller size, they utilise riskier investment instruments and strategies to increase their market quota.

The result is corresponding to the hypothesis to the first previous research question since interviewees think it's easy and more promising based on people' s familiar field, but not completely correspondingly with the second hypothesis since companies at different sizes and stages need to use different sources of financing and in the current process of business transformation, in the short term, companies will pay a lot of costs to help transform their businesses, especially in the manufacturing sector. As in literature review, Strong relation between green investment and performance of the company specially in the long term to achieve energy efficiency and emissions reduction. This is also confirmed by experts.

Therefore, companies should focus more on the long-term benefits and focus on capital investment in the present. As described in the literature review, there is a need to optimise the supply and demand pattern and the total structure of the energy system.

The literature review also mentions the importance of increasing social awareness of everyone in the society. As experts illustrates Individuals should be more concerned with the sustainability of the products or services they buy or use in their daily lives. For example, more sustainable food production processes, packaging with more sustainable fabrics, more sustainable building materials, etc.

From the result of the survey, the number of participants in this survey was small and the sample of men and older people was low. To some extent, this study loses some of its accuracy and informativeness. But it is clear from the data available that the opportunities for individuals listed in the survey to potentially practice in the field of carbon neutrality are very viable. This is because, except for the over-specialization of carbon reduction technology inquiry, each of the employable fields has a selection rate of about 15% or more, and most people are willing to incorporate the concept of sustainability into their current studies and work. Surprisingly, in the survey, older people are more likely than younger people to have the intention of committing to carbon neutral and related fields at this stage or with their original career. But Jia said in his interview. The main audience of his channel on spreading knowledge about carbon neutrality is young people, and there is a lack of middle-aged viewers, whose careers are most affected by the carbon neutrality process. Therefore, they should pay more attention to and learn more information about carbon neutrality to help them in their future career development.

X. Conclusion

The paper begins with a list of issues, including the subsidies and policies that the Chinese government has put in place to optimise the current energy system to achieve peak carbon and carbon neutrality, and the need for a greater sense of social responsibility for everyone. With the problem stated many people lost their jobs because of the bad economy and the epidemic.

This paper first focuses on finding the new energy sector to be the most promising of all carbon neutral related fields. This includes solar power, wind power, storage technologies for electricity, etc. The impact of the embargo on the supply chain due to the lockdown of the countries and the profitability of solar and wind projects are also outlined. Finally, some ways to invest in the new energy sector are listed and the role of government policies and subsidies is emphasised. As well as strong relation in the long term between green investment and performance of the company specially in energy efficiency and emission reduction. Through the advice of experts, and policy-oriented background, the viable approach to new energy, such as placing solar panels on rooftops, or building and connecting the grid… may not be as good and profitable as combining it with people's own expertise. Individuals can get better development opportunities by combining their expertise fields with low carbon fields. They could also choose in the following areas. As those areas have been mentioned by experts and agree with people who participated in the survey.

- Optimise the production and manufacturing processes of products and buildings, considering low carbon, energy reduction and efficiency factors
- Selling green products (environmentally friendly products)
- Investing in the stocks of low carbon and environmentally friendly companies
- Researching carbon reduction technologies
- Green finance (financial services provided for project investment and financing, project operation, and risk management in the fields of environmental protection, energy conservation, clean energy, green transportation, green buildings, etc.)
- Electric vehicles, raw materials for electric vehicles
- Carbon Asset Management

To obtain better employment opportunities, individuals can participate in learning about carbon neutral areas, such as managing carbon assets, green production chains or related emission reduction technologies… to help companies innovate and transform. Individuals can also find employment opportunities in the field of education, such as corporate training, training of talents in universities related to carbon neutrality and carbon peaking and construction of teaching systems.

Individuals should choose their investments wisely and carefully, considering their knowledge of the industry and professional analysis. It is very valuable for the society to build an ecosystem for environmental protection in which both products and services can be greener and respect the environment and people can start with themself and choose to purchase more environmentally friendly products and services.

Small businesses could focus on technological innovation and research on carbon reduction technologies, which will increase the probability of getting investors and making profits. At the same time, people can also innovate in product development to provide the market with low-cost environmentally friendly products. For raising funds, Companies can look for different sources of financing at different stages of the company and focus more on the long-term benefits and on capital investment in the present. Finally, it is important for everyone to pay attention to the government's policy direction.

This article contributes some guidelines to help people get a job and how to choose investments or start a company. It also gives some learning paths that people can take if they want to grow in the field of carbon neutrality. And it summarises that at this stage, having innovation and technology will be more advantageous, and reminds investors and individuals, before investing or practising for either financial markets or employment options, that it is best to have good theoretical and practical knowledge which to understand the big picture, to understand clearly how to exactly operate before making a final decision.

For the limitation of this paper, because the interview time was relatively short, it was not possible to provide in-depth interpretation and hands-on knowledge of each promising carbon neutral field. In addition, the number of participants in the survey was not large enough to derive the individual impact of combining the carbon neutral field with the traditional employment field, which provides a basis and pavement for

subsequent research on this topic. In the future, people can start from each feasible carbon neutral area, search for information and ask the relevant experts in the field to develop a more suitable transition plan for people at different stages and in different positions. And for different companies, the areas can bring economic value while also generating good environmental benefits.

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XIII. Appendix

Appendix A: Survey Questions

01*(Required) May I ask your gender?

- Male
- Female
- Other

02*(Required)Your age?

- 0 years old - 18 years old
- 18 years old - 30 years old
- 31 years old - 40 years old
- 41 years old - 50 years old
- 51 years of age or older

03* (Required) Your annual income is approximately? (In CNY)

- Not currently working
- Less than 30,000
- 30,000-80,000
- 80,000-150,000
- 150,000-300,000
- 300K or more

04*(Required) for your current career field? (Checkboxes)

- Student
- Retail
- Education Industry
- Information Technology
- Media & Communications
- Health Care
- Transportation
- Entrepreneurs

- Other

05*(Required) education level?

- High School and below
- Specialty
- Undergraduate degree
- Master's degree
- Doctorate and above

This second section is followed by some questions about the carbon neutral sector to find out how participants understand the topic and whether they want to invest or work in the sector.

06*(Required) Do you understand the carbon reduction industry and related policies related to carbon neutrality?

Carbon neutrality means that the total amount of carbon dioxide or greenhouse gas emissions generated directly or indirectly by a country, enterprise, product, activity or individual within a certain period can be offset by afforestation, energy conservation and emission reduction to achieve positive and negative offsetting and achieve relative "zero emissions".

- Very well understood
- Have a general understanding
- Know a little
- Don't know at all

07* (Required) Do you think the field of carbon neutrality can be combined with your current field to create more possibilities?

- Yes, low carbon and sustainable development brings many opportunities for personal and business transformation
- No, the implementation of carbon reduction projects has reduced the profitability of companies and many jobs have been hit hard.
- Perhaps the future is possible, but not yet seen

08*(Required) Would you invest in stocks of more environmentally friendly companies with similar profit margins?

- I don't invest in stocks market

- Yes
- It doesn't matter to me

09*(Required) Which of the following opportunities in the carbon neutral field would you prefer? Checkboxes

- To work for a new energy related company
- Helping companies make the green transition to get better investment
- Optimise the production and manufacturing processes of products and buildings, considering low carbon, energy reduction and efficiency factors
- Selling green products (environmentally friendly products)
- Investing in the stocks of low carbon and environmentally friendly companies
- Researching carbon reduction technologies
- Green finance (financial services provided for project investment and financing, project operation, and risk management in the fields of environmental protection, energy conservation, clean energy, green transportation, green buildings, etc.)
- Electric vehicles, raw materials for electric vehicles
- Carbon Asset Management

10* (Required) The low-carbon industry is currently a new industry with great potential for development, but it has not yet formed a scale and needs more people to participate in it. Are you willing to enter this industry at this stage?

- I am willing to
- I will consider in the future
- I am not considering

The last three questions test whether the interviewer's lifestyle tends to be more energy-efficient and emission-reducing.

11* (Required) What is your main mode of daily travel?

- Walking
- Bicycle
- Self-driving
- Taxi
- Bus
- Subway

- Train
- Other

12* (Required) If a green product (more sustainable and environmentally friendly) is currently sold at a slightly higher price than similar products, would you consider buying a green product?

- Yes
- No
- Acceptable if only a little higher

13*(Required) New energy vehicles are an important initiative to reduce carbon emissions in the automotive industry. Would you choose to buy a new energy car because you think it is more friendly to the environment?

- Yes, this is one of the factors I would consider when shopping
- No
- Not currently considering buying a car

Appendix B: Transcript of Interview with Jia Hu

Interviewer: Wang Wenyi
Respondent: Hu Jia
Interview time: 04.05.2022 7:00 a.m.
Interview location: Online
Duration: 43:44 mins

START AUDIO

Interviewer: The first question is your name, can I put your name in my paper?

Respondent: You can.

Interviewer: Great, and then the second question is, could you talk about the current company or sector you are dedicating to?

Respondent: I work for one of the largest integrated energy groups in New Zealand. We have upstream oil and gas extraction, downstream power station construction, and retail energy. In addition to that, we have several other branches, including some investment institutions. I have been in the energy industry for over 15 years. In the energy sector, carbon neutrality is a very important entry point. Because we are a company whose main business is oil extraction. Our main business is a process that releases a lot of CO2s, so our company is actually one of the top companies on the government list, one of the industries that releases the most CO2. The government is also very strict in regulating us. New Zealand, like Europe, is very advanced in terms of carbon emissions and carbon trading. I would see Cambridge University as very advanced in terms of theory. The countries in continental Europe have always taken a route of energy saving and emission reduction, and green environmental protection. The United States was the opposite of other countries until last year. New Zealand, in fact, and Europe are similar, also after 2000, when the establishment of the ETS scheme (Emission Trading Scheme). Recently there is more avocation to carbon emission reduction, the introduction of a lot of carbon emission mechanisms, including that is the price of this carbon emissions, carbon emission market quotas, etc., to prompt some high carbon emission enterprises to transition, or to find ways to reduce carbon emissions. Our company should think the same as the government. We are on the N. 1 watchlist. All the points that the government considers, we must think and try to have all the world's most leading technology, including carbon storage, including some energy-saving emission reduction technology which is very related to the actual operation and profitability of our company. So, I will especially have a deep understanding of this part of carbon emission reduction.

Interviewer: Yeah, that's great, you have a lot of practical experience in how to shed carbon emissions in this area. I hear these experiences of yours, and I think they fit the main theme of the paper very well. I have a PowerPoint presentation of exactly what I wrote in that paper, and then I'll share it with you.

Respondent: Sure!

Interviewer: First, it's the title of my paper. I investigated the process of carbon neutrality within China. That is, our government is trying very hard to reach the goal of achieving carbon neutrality in 2060. And then the second one is supply and consumption and the whole social system needs to be optimized, the whole energy system needs to be changed, and social responsibility for individuals is also needed to improve.

The main theme of my dissertation is to help people who have lost their jobs or have difficulty in finding employment, or individuals or small companies, how to take advantage of the process. My literature review found that China is very rich in solar and wind power resources, and natural resources. And a lot of emphasis by the government on infrastructure development, grid construction, and ultra-high voltage projects in China. Because the epidemic has largely affected the wind power supply chain, especially offshore wind power has been affected heavily. And the cost of solar and wind projects, as the number of facilities increase, the cost goes down. I also give some examples on possible investment way for investors, for example, investment in solar panels, stocks, building mini-grids in communities, some of the more traditional ways, and green credit for the role of small business financing, and finally the huge role of the Chinese government in achieving carbon neutrality, and the importance of innovation and technology, and finally this is my mythology. These are the specific proposals that I must ask you, and I have incorporated them into your questions, which is one of the things that I basically have written in my thesis. Just now we talked about your practice in the oil company, which has a lot of advanced methods, which methods do you think are more suitable for some small enterprises or individuals in China, and which areas are more suitable for investment?

Respondent: This is what it looks like. First, the Chinese government's carbon neutral policy is a commitment made at the United Nations General Assembly in the summer of 2020 - a commitment at the government level. In fact, in all countries around the world, the goal of carbon neutrality is a government commitment, because the government has a commitment, so the government will mobilize market resources to make this commitment happen, and enterprises are often passive to accept and change. For example, we have a carbon price in New Zealand, the market price, the government is in fact the main body to set the market price, the government raised the price, the cost of operation of enterprises will increase, for example, companies like us, the higher the price of carbon, the higher the cost we pay, when the cost is high to a certain extent, the company will no longer have the incentive to do this oil exploration, may go to do others things. For example, we now have a lot of peers who have

switched to solar power development, which is also a rather interesting phenomenon. In addition to solar power generation, all fields that can obtain carbon products are of interest to companies like us. For example, if you invest in afforestation, in fact, in the UK, Europe, New Zealand and Australia, they are the same. The government can come and calculate your tree planting. Because your tree can absorb carbon dioxide. Each tree has a standard, for example, how many years the tree grows, its whole size. Then it will have a standard formula that says, then the tree can be given how much carbon dioxide quota, or carbon product.

This is one of the more popular ways to invest in the Western countries. Why? Because under the current form of carbon pricing by the government, the price is bound to be higher and higher, and it will be so high that companies can't afford it. At this time, enterprises choose to plant trees, one of the simplest reasons is that the cost of planting trees, the cost of obtaining the carbon quota is relatively low, and may even say only half of the current market carbon price, enterprises will have such an incentive to plant trees, even if I am not a planting enterprise, but now there is a planting fund like this, this fund it will bring together all the large enterprises that may need carbon emission allowances, and then they will contact the reforestation companies and make direct investments. In this way, they can earn a management fee in the middle, and at the same time, when the forest is completed, the forest will be forwarded to the fund of the investment. This is also a popular way.

As you mentioned earlier, small and medium-sized enterprises, in fact, in every aspect of our clothing, food, housing and transportation, it will soon involve low-carbon emission reduction, especially in China, I cite an example, many of the products, its packaging, you will see more and more of them become a very low-carbon packaging, such as a paper packaging, including that everyone is now driving an electric car, right? Now the gasoline car is less and less, because driving an electric car in larger cities such as Shanghai, because I am a Shanghai resident, in Shanghai, if you do not drive an electric car, you do not have a licence plate to buy a new car, you need to wait for it, the licence plate is very difficult to get, if you buy an electric car, the licence plate is given to you. So, the government, through some administrative intervention and some policy support, slowly led everyone to green travel in such areas.

Including food. Now more and more people hope to use organic low-carbon green food, especially in New Zealand, a country which exported a huge amount of this category to China every year and exported to the world. There are a lot of food, plants, including some health products that follow the current trend, then from housing, that, a lot of housing, in the United States, are getting greener with carbon emission reduction. As one of the main criteria for building commercial property, If the house does not meet the government's emission reduction standards, the house will not be approved for completion. In the future, there will be many similar things in China. For example, if a company builds a commercial building or a residential building, it must consider the CO2 emissions of the process. So, when all the industries of food, clothing, housing and transportation are moving closer to this energy saving and emission reduction,

there will be a lot of new practices. In some of my previous videos, I also mentioned that in the emerging economy, many people will lose their jobs, but there are many new professions that will emerge. Or even the small grocery stores. Although many people in the traditional industry may not have jobs or may lose their jobs. But then, in the field of new energy, such as wind power, such as solar power, electric vehicles, will also create a lot of opportunities, a lot of job opportunities, I believe the whole transformation is not completed overnight. But I believe it is very, very fast, because in the first half of 2021 I did a video about carbon neutrality, which did not attract a lot of attention at that time, but by the second half of 2021, more and more a capital, choose to enter this field in China, and now in the first half of 2022, so far, almost I can hear a lot of funds in China, and capital, basically are moving towards this track, previously never involved in the energy sector, never do the so-called energy saving and emission reduction fund ideas, all began to allocate a certain amount of capital to enter this field, because this and the government policy is a certain correlation with a long-term consistency. Then as an investor, the most important thing is the policy support, including the continuity. You will see a lot of capital will enter this field, you will see a lot of innovation, including China's electric car, a lot of China's capital investment to establish such institutions, although China's electric car still have distance compared with Tesla, I believe that China will have more and more electric car brands in the future, the same factory manufacturing will also create a lot of jobs, in fact, our country is now the most lack of development of the manufacturing industry, the most needed is the basic function, manufacturing industry can absorb a lot of employment, this is actually a great direction.

Interviewer: So, what would you recommend, is that individuals can go into manufacturing jobs?

Respondent: Yes, because many people have asked me the same question, including I have many friends who do industrial design. What do we do to be able to have a chance on this track? And I said when you do design, you can consider the low carbon factors. Then for small businesses, people can try to discover things through daily life. Start by paying attention, for example, opening a grocery store, for example, I am doing Taobao, I can sell some green products, right? Because now a lot of young people, I am very interested to find out that now a lot of young people are supporting environmental protection and being green, unlike our generation, just commenting but without any action. Now a lot of young people think that being green is very important. They are hoping to do something to change the world, to make a difference, which is an opportunity for many companies. For example, if you make clothes, then you can choose low-carbon materials, right? You can be non-polluting, all aspects of well, you can start from that supply chain to find you can also develop from the product itself.

Interviewer: It makes sense, so that the European market will also be more welcoming to these products, and to a certain extent will increase exports, after all, China is a world factory. Optimise our own industrial processes, optimize our various machines,

and make things more environmentally friendly. You make a good point. The other thing is that the Chinese policy is also very important. We need to pay attention often and see which area will get more promotion, try to go to that area, for example, electric cars, you just said there are some factories, like talent, technology, product design. We just talked, which areas are very suitable for investment, which areas are suitable for small company to invest, will you give these people some which advice, is how to go, for example, we want to go to invest in the field of electric vehicles, how do we want to be able to find some relevant information, how to analyse this market?

Respondent: I think this is a relatively large subject. First of all, in China, especially in the field of carbon neutral, it is the policy support, first of all, from the government planning, last year, it will have a 15 plan, 25 plans and so on this kind of planning, you can see what areas the government will develop, which energy saving and emission reduction area worthwhile for investment or input, and then you can look for your own more familiar field. After this selection, you may need to ask a bank online, may need to go to some investment institution, some friends, including some brokerage analysis report, will give you some more or less insight. For example, it is good to ride an electric car, or we produce small packaging, this packaging can be a very energy-saving and environmentally friendly green packaging, which is also a very good idea. I think from top to bottom, first from one is to understand our entire macro environment, where the world's trends are. the second is China's trend in what fields, the future control of a general direction, the strength of policy support and policy consistency, looking the different industries inside to see which industries are more familiar, then do some industry analysis, which companies in the industry are good to learn from, or just can be acquired, and then according to the analysis of these industry companies, and then make their own more sensible judgement. People also can invest in speculative stocks, to invest in or buy company's stock, or that people can invest in a business themselves.

Interviewer: In addition to some macroscopic research, it is recommended that individuals be able to combine their own practice with energy conservation and emission reduction, which can also play to their strengths, because he is already an expert in this area, he just needs to add in the environmental factors, he has a lot of room for development. I have a question about how to get capital. If a small company wants to engage in this sector, for example, wants to optimize their own products, how to get capital?

Respondent: When it comes to the capital market, the investment market, they are more mobile. For example, in the United States, in China there are many venture capitalists and angel investors. If you start without capital, these people are your first round of financing, then if your business reaches a certain scale, for example, your business is profitable, or has sales, you may choose some funds, from some private equity investors, to invest in you. If you get bigger, like some of the larger private equity or investment personnel to choose, it all depends on your own personal familiarity with

the capital market. In addition to this, you can also try some national government subsidies to develop yourself, then it may be said that there are some areas in which it will give a certain amount of money, which does not mean that every field every person can do, which is generally related to scientific research, in addition to this, the financing itself is a capital market thing, this is my personal view. It is not quite the same as academics. Investors must see the business is having profit. Then he is willing to invest in your business, if your business is not profitable, he is not optimistic. It will not be the same as the government that always has rebates, because people are willing to do this thing, then they encourage them. There are some governments that will have some of this support fund, for example, like some governments, such as every year. it will have somewhat Competition, like entrepreneurial competition, especially suitable for such as you college students, for example, I now have a project, I have a team, that I now take a proposal, I have a plan for investment, and then go to a competition, it is also possible to get a prize after also can this have this start-up capital, I once went to try to participate in the competition, now China has a lot of such large Competition, there are also many people to teach you how to write this business plan, how to get that investor's money, which is very mature, not that it is a particularly new thing.

Interviewer: Then I'm basically done with the questions. By the way, do you think there will be more developments in the carbon neutral sector after blockchain and other technologies?

Respondent: Blockchain is decentralised, involving the owner of the data will become an individual, not a company, not a business, and then you may be able to sell the excess to other users, not to businesses, and this creates a whole new market. This market is still very, very elementary now and may not have taken shape yet. In the future, after this meta-universe that is used in all aspects, in retrospect, it will be more mature to see the development related to new energy.

Interviewer: This answer is really good, we still have a lot of room for progress afterwards, about this new energy field, I think my question is finished , you answers are very well, give me a lot of inspiration, I really like you, is the little red book, I do not know if you still have in other platforms to publish our video, do you have YouTube channel ?

Respondent: No, I was like this, it was in February of this year, the middle of February, suddenly I wanted to say to do this thing, because my team and I have been working together for many years. I started to do online education in 2016, doing some business courses. We put the video on Xiaohongshu, Toutiao, Kuaishou Douyinand Bilibili. The result is very interesting. NowDouyin , Kuaishou has very few people watching, I don't know why, but Toutiao basically has no one watching, Xiaohongshu is the most, Bilibili is the second. For the age group in our channel, the largest is the young who have a more knowledgeable and cultured background. But not many middle-aged uncles. I'm very happy to see that now many young people are very interested in this topic, but on the contrary middle-aged people are less interested in this topic. In fact, it is possible

that this topic, this thing itself, for those middle-aged people, their job search, their future career development may have the greatest impact, many of them may be because of this thing to lose their jobs. But they are instead the least interested in the Toutiao. They are basically looking middle-aged and above, no one looks at it, no one cares at all, instead, the little red book will be more, and then Bilibili also has a lot of people watching.

Respondent: I think the channel will update continuously about those hotspots, news... Once our followers reach a certain amount, we can be a spokesman or do some advertising. Then those will be able to help me. Some domestic investors in the professional fields, in fact, there is some cooperation, then there are a lot of domestic funds, some funds may be the size of 11 to 21, they will go to invest in some related projects. I hope to be able to be an expert or a knowledgeable and educated person in this field of being. Because I am in the investment business myself, I am responsible for the strategy of the whole group, that is, the global strategic investment strategy. For me, there are more means to cash in, for example, I can take advertising, I can also talk with core investors, if we have some projects, I can also act as an angel investor to invest in some projects, at present. For carbon neutrality, at least we are at the forefront of the times, the world is now basically everyone's starting point is the same. The European side start it earlier, but the European capital amount is not as good as the U.S., the U.S. is now catching up fast, China is even faster, everyone is desperately learning, China's speed is very amazing, the infrastructure construction only need a few months from zero to a large scale, which is completely no way to compare with Europe, so there will be some explosive opportunities in this, and then I want to be able to keep up with the times.

Interviewer: It makes sense, but I think China, China also has certain constraints by Europe and the United States, for example, those companies in Northern Europe have done very mature, the product is also very environmentally friendly, to a large extent, investors may want to invest in those companies, China’s companies also constraints by the emission control Policies, to a certain extent, the development will still have some slowdown.

Respondent: We now see a lot of funds that go abroad regarding carbon product trading, there are also already a lot of foreign funds to carry out with Chinese cooperation. According to my knowledge there have been several because they are seen as a mature thing in the Western countries. Because this volume of carbon trading in China is too big, China is the second largest Marie the first is the United States. its entire market volume is very large, and then in this case, there will be a lot of capital and people have a lot of opportunities. How to say it? I think it is still quite hopeful, even if the Chinese economy today may not be good overall, but in some areas, then there is still a relatively promising, I think the carbon neutrality more promising.

Interviewer: Yes, especially in the following five to ten years, this field will certainly develop more and more.

Respondent: Because it has a policy of support, in the past, China's environmental problems have not been solved for the reason that various departments it is mutual constraints, no one is willing to take the first step, now this President first said, the countries have to do today to complete this goal, it said like that and the government will provide support, this is no way, for western countries can reach the efficiency of making change compared with China. the West's its different regimes of alternation, different parties, sometimes its policy will be different, but in China it is consistent. Once the countries want to accomplish this goal, it is sure to complete it. For investors, they want to spend money to go in. First, I cannot have uncertainty, because in this industry sector I must have certainty. There is a policy to support long-term consistency, I am willing to do it, otherwise, we will waste time.

Interviewer: Okay, thank you very much for the interview today, I'm done with my questions, and I'll terminate the recording here

END AUDIO

Appendix C: Transcript of Interview with Haowen Chen

Interviewer: Wang Wenyi
Respondent: Chen Haowen (Vivian)
Interview time: 07.05.2022 10:30a.m.
Interview location: Online
Duration: 35:58 mins

START AUDIO

Interviewer: Let's start the official part of the interview. Could you mind giving a brief introduction of yourself?

Respondent: That uh, my current situation, is that I am, in fact, at the beginning of this year officially back and joining in the double carbon track (The job related to the process of achieving carbon peaking and carbon neutrality). Many people may think that I am switching-Changing careers, in fact, not, in fact, I did my undergraduate degree in environmental engineering. It's my first choice when I was applying to universities. And at the time when I graduated, the job prospects were not so clear, as well as not many job options with good income. So, at that time I went to be a consultant, then work in the first party. Nowadays, the opportunities for people who studied environmental related majors, such as environmental engineering, clean energy and other related industries, are booming personal employment opportunities and some related business opportunities… Then I indeed also verified this point.

Interviewer: Yes.

Respondent: Ah, talking about the consulting company I am working at, in fact, we don't have many tasks recently regarding the environmental industry and now mainly doing some corporate training related to carbon neutrality. At the same time, I received quite a lot of demand about individual career development plans, especially for college students who will soon graduate within two years. This part of the demand is quite a lot. And then if you have noticed, two days ago the Ministry of Education of China had posted an article about strengthening the construction of carbon neutrality and carbon peaking related majors and the cultivation of talents in universities. This is actually an obvious signal, um, includes the future form of employment. I believe by the time you graduate, there would be more clear instruction toward this industry. Well, yes, if it's uh in Europe, there are a lot of opportunities. But if you go back to your home country, China already has the largest market for greenhouse gas emissions trading in the world. Well, although it's only about electricity. In the future it will gradually expand to some other industry. So ah, the clean energy that you are talking about is very important, as an alternative to optimise energy structure, including energy efficiency…

ah, that I listened to a hydrogen energy industry meeting this afternoon. People nowadays really pay a lot of attention to this.

Interviewer: unh.

Respondent: So, tell me what part of your main concern is. I'll do some more answers to your questions.

Interviewer: So, since you're more focused on the employment aspect, we'll focus mainly on it.

Respondent: Okay.

Interviewer: Because I was looking for a total of three experts in this area. And the first one is a man who works for one of the largest oil companies in New Zealand, and he's doing some strategic planning for the business. And then he was probably more focused on the areas that would be more worthwhile to invest. Uh, first, can I mention your name in my paper?

Respondent: Yes, you can. Yes.

Interviewer: Yeah. Because I'm going to briefly talk about what I wrote in my thesis. First, I mentioned that many people have lost their jobs because of the epidemic. Well, first, many companies have shuttled down, and many people have lost their jobs. And then, I just want to help them find some worthwhile investment opportunities or job opportunities and help them get through this.

Respondent: Well.

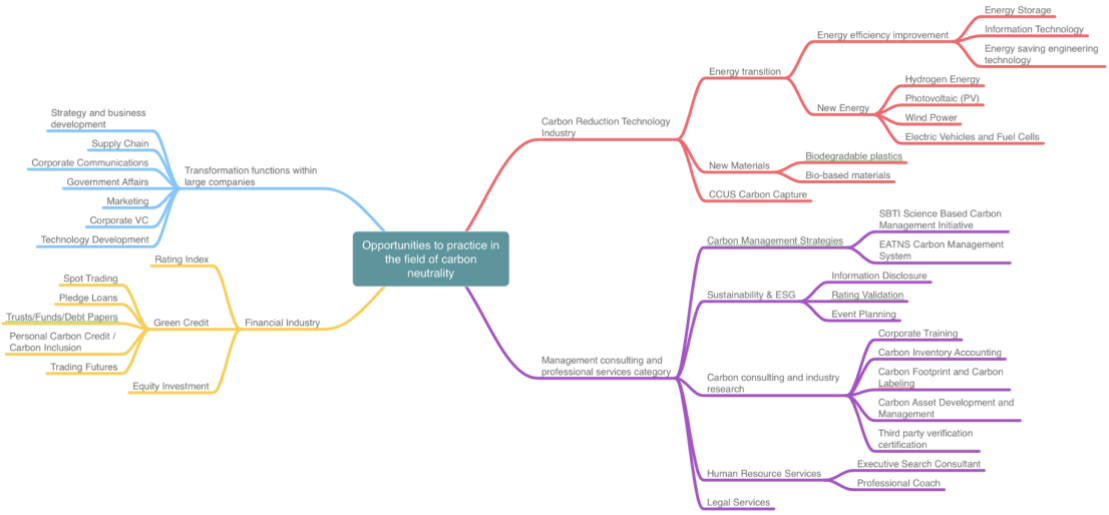
Interviewer: Then I mainly looked for some information, and I found that there are many good resources of solar energy, wind power, power grids, and carbon storage, in our country. There are a lot of policies and subsidies to those. Then generally speaking, the carbon integrated project in our country has very clear objectives. State funding has a lot to do with the profitability of the company. Yeah, and then my thesis is basically exploring that question and then getting some professionals to answer it afterwards. Well, in your understanding of the current situation, what areas do you think are worthy of investment by small investors?

Respondent: Uh-huh. Uh, I would start talking about this industry, so as you just said that this policy-oriented domestic background is going to exist for many years. I believe there will be even until 2030. Because, now, companies make lots of effort and cost on energy transition and reduce emission with not much revenue. Well, of course, with the further construction of the carbon trading market in China, it will also bring a positive asset. But most of these companies will benefit from the carbon trading market because they have the technology to reduce emissions, or they can create the benefits

of reducing emissions. Most of the enterprises that have the pressure to reduce emissions. They invest a lot, rather than gain an additional income.

In this case, if you refer to the development path of new energy in China as well as photovoltaic. Their early stage needed vigorous support from the state. Uh, whether from the policy point of view, from the construction of this market system or from the training of talent or above, these are of very high relevance. It's inevitable that they need a lot of resources to support the development. In any place, it is like this. I believe that Europe, which has developed over the years, can also be seen, initially also as such a path over.

So, the government now uh did not take any administrative means or through the carbon tax. The state encourages innovation in the market for technology and it can support large enterprises that do not have some access to it. Then if there are some research institutions or individuals, they already have such technology, or have some patents… We see that in this picture I gave you, in fact, these several related paths we can find, can go to investment prospects. Then this means for individuals that one aspect is that we can personally plan for our career development and can go as close as possible to these areas.



Ah, for example, Employment opportunities in traditional power generation industries, such as coal, are decreasing, right? So, these people or talents in which sector to flow? Must be to the new energy industry, must be to the sector to energy efficiency. Given an example of the Real estate industry, the overall situation in the past two years is not optimistic because of the impact of the bad economy. Then the real estate industry could change their strategy to green building and improvement of the comprehensive energy consumption. So, in the future, no matter what industry you are in, if you have such cross-field knowledge and understanding of the policies and orientation of the dual carbon industry, you will have a good understanding of the future career selection. This is the new era, or in the dual carbon era, a demand for talent.

When it comes to personal investment, I personally think that in the current situation in China, we have not yet reached the point of personal investment. But now how can individuals participate in the dual carbon, uh, we can see that some regions in China like Shenzhen and Guangzhou are already proposed as this personal carbon inclusive. In Tencent, these companies cooperate with the local ecological environment bureau. So, individuals can accumulate some carbon points to participate in. For example, like green travel (Using green transportation, public transportation), such as riding a shared bike or taking the subway. Uh, uh by not driving a private car this way, you can get more points, and then the points can be converted into personal carbon credit. Ah, this has gone through the path. In the Yangtze River Delta and the Pearl River Delta, our own partners in Yangtze River Delta, we have also been discussing whether we can issue a kind of transportation card, so that when Shanghai citizens take the subway or ride a shared bike, they can record the points, and then this becomes a way for us to get carbon credits. Then this is the most direct way for individuals to invest in carbon finance.

In addition, for individuals, many consumer goods companies such as food, clothing, or household goods companies, are promoting greener production. And calculate the whole production chain of this product, the whole life cycle, a carbon footprint. Apple has been an early mover in the world to record its carbon footprint, and it's marked on the top of its products. In China, I see a few good examples, like Yili, Mengniu, their agricultural products, beverages, and milk. They have obtained some carbon neutral certification. Then there are some OATLY, Starbucks, IKEA, and other corresponding cases. If consumer goods are also doing well, it's a way to participate if individuals are buying products that are more environmentally friendly.

Interviewer: Well, all the way that you said are very useful, that is, to do some environmentally friendly actions from the food, clothing, housing, and transportation of each of us. I think that's very important. Because everyone is a part of society, and then Europe is probably more environmentally conscious than some cities in China. Part of it is also due to the many years of awareness and education.

Respondent: Well, yes, that makes sense.

Interviewer: Okay, next question is about the content of your channel, for example, if you want to work in the field of carbon neutrality, what are the certificates that are worth taking for individuals. Because I'd like to get some certificates myself. It would be very useful for employment.

Well, this question has been asked many times, and I always answer that: what kind of certificate you want to take, or what kind of qualification you want to get, is most directly related to your personal career plan. I would like to reiterate this point here. Of course, many people may still want to say that at this time I first get some necessary knowledge, to do a primer, I can judge whether I am suitable to practice in this field, this can also be. Then we have some pretty good entry-level training in China. Whether

it's fee-based or free, it's quite good and accessible. I'll give you an example, this weekend, we started a new seminar on dual carbon and sustainable development at Fudan university. This is ideal for people who don't know what dual carbon all is about, and don't know what kind of relevance it has to their business or personal development. This kind of introductory and general training is very suitable for this kind of person. We will not only invite many professors to speak to you. In addition to sharing policies, trends, and insights, we will also have our environmental faculty and students, including myself. We will share our views and opinions from the perspective of the industry, from the chemical industry, from the water industry, from the perspective of sustainable development, and even from the perspective of human resources and talent development. The cost is not too high for beginners. Then some other relatively speaking will be more professional. For example, we do the certification of CPER and Carbon Emission Trader of the Environmental Energy Exchange. These certifications are more suitable for practitioners in the field, for example, in finance, in executives, in the emission reduction and technology enterprises, or those engaged in these consulting or more professional services to get a refresher course. Because this is more to help you understand more comprehensively what carbon trading all is about, and how to do it. The whole logic and process, what kind of methodology it requires, where it is involved, how to do the trade. These are very practical and macro financial knowledge. In addition, there are some internal companies, usually in the supply chain, or in the strategic position of the company. We are most concerned about how to set its carbon targets, how to complete its path map. For managers or professional managers, I recommend BCG's online, free training, which helps people to do a baseline inventory based on the baseline inventory, scope 1-3. Then how to set goals and how to accomplish this synergy of different departments to accomplish our internal transformation. Such an online training with case studies and practical exercises.

At the same time, I would recommend several specialised books. I recommend that you read both introductory and specialised books. These include Wang Jun's Carbon Neutral Times and Bill Gates' Climate Economy and the Future of Humanity, both of which are relatively introductory. In addition, BCG (China Centre for Climate and Sustainable Development) has published a general guide to carbon neutrality in China, which is more professional. It is divided into seven key industries, as well as the strategic level of corporate practitioners or consulting practitioners, like a practical guide of tools. In addition, if you are engaged in the work related to corporate sustainability and ESG, then the book on CSR theory and practice by Dr. Guo Peiyuan, the general manager of Business Road Vertical, is very suitable.

Respondent: Yes, it's so useful. I'll get them all out and read them afterwards. I just heard you say that BCG's is how to do some strategy on the environmental issue for companies, and then how to plan the flow chart afterwards, and I would love to do this kind of stuff afterwards.

Interviewer: OK Well, as you said that there are a lot of good projects abroad now. Because the object of my service also for students who wants to go abroad ah or want

to further study. Well, yes, and then there are also some people who got into some foreign graduate schools, but want to return to China in the future, to work in this area. So why I recently started doing these programs like the Spanish- French program, uh, including the fact that we can see that Harvard has an online technical college program that is also very good. It is because nowadays, various people, different age groups, and their career development needs are not the same. People is currently engaged in a different job, in fact, his needs will also be very different. Then, according to the needs of different people, I will have to customise to recommend some more suitable path for you, and some suitable projects. For example, if you have been working for a long time, if you are a professional manager in a company, or if you are working in the consulting field, or even in the financial industry. Then actually this kind of online foreign program is very suitable for them. Because they are not purely a basic knowledge of understanding, they need a more advanced knowledge of sustainable development. There are some foreign programs that are tied to internships, and with the support of the Ministry of Foreign Affairs or the embassy, you can even get local residency conditions, as is the case in Spain. So, in this case, it is more suitable to make a little more investment. To get this master's degree. The online master's degree is also possible. Now, based on the situation in China, I still recommend that it's more flexible to get access to foreign universities. At present In China because in this field, the corresponding master's system has not been fully established. The current masters are more specialised: for example, engineering, architecture, but not across fields. For example, green buildings. So, a friend of mine went to the University of Pennsylvania to get a degree in green building or environmental architecture, and it was a very, very good choice for him.

You have a clear position for yourself, which is the route of management. In the future, whether you are looking for an internship or a job, you may prefer to go within the company. So, this depends on your personal suitability and your future choice. What is your direction? In fact, there is no such thing as right or better. What is suitable is the best.

Interviewer: You make a lot of sense! I am inspired by many of them. I have one last question about how small companies can get funding. The concept of green credit is very hot lately, and then do you think it's hard for small companies to apply for it?

Respondent: It depends on what kind of small company it is, now it is easier to get support for digital companies, doing SaaS, but the threshold is lower. There is another kind of company that has the core technology advantage and team that is more likely to be favoured by capital, as I just said in terms of emission reduction technology. This is roughly the case in China now.

Interviewer: Good. I've heard that in some countries, they have a lot of technology because they've been reducing emissions for many years. It's only logical that companies with better technology will get more investment. And then for developing

countries like us, we have a lot of manufacture industry. China are the world's factory, which means that we have a lot of carbon emissions, but the technology to reduce them is always a challenge.

Respondent: For us, it's not exactly. Now China is in such a big context of 2030, 2060, in fact, the pressure to reduce emissions is still quite big. So, it is actually quite encouraging the development of some of these, some of the new technology applications ah, the development of ah is more encouraged. Okay, and I know there is. Well, for example, two days ago, China's Development and Reform Commission issued a biological economy of the 14th Five-Year Plan. About the bioeconomy, how to apply, such as the application of new materials, to do the degradation of plastic, or to do plastic alternative products. In fact, there are some very good new enterprises in China that can already be seen.

Interviewer: Okay, thank you very much for joining me for the paper interview, and I'll put some of this on the record afterwards.

Respondent: Thank you, and I'll be back if you have any questions.

Interviewer: Bye bye.

END AUDIO

Appendix D: Transcript of Interview with Sunzhe Cao

Interviewer: Wang Wenyi
Respondent: Cao Sun Zhe
Interview time: 10.05.2022 11:00 a.m.
Interview location: Online
Duration: 27:19 mins

START AUDIO

Interviewer: right, um, okay. Well, I'll call you Gigi.

Respondent: That's fine.

Interviewer: I've read the questions that I wanted to ask, and then they're actually very detailed in your channel, and then, okay, the first question is can I mention your name in the paper?

Respondent: Well, yes, no problem.

Interviewer: Well, okay, because I'm in Spain, and my university is Pompeu Fabra University, and I don't know if I can get this paper published. I'm not sure if I can get this paper published, but the European side wants to know about the situation in China, right? And can you tell us a little bit about yourself? Like where are you working now or something like that.

Respondent: Well, okay, well, my full name is Cao Sunzhe. And I'm working in Beijing. I'm working in a central research institution, and I'm mainly doing some work related to energy conservation and environmental protection. Some of the things we've been doing recently are mostly related to double carbon, that is, carbon peaking and carbon neutrality. Because we are a research institution under a state-owned enterprise, so most of the work we do is for the government. So, we have to do some, relatively speaking, planning type of work. For example, in the future, maybe until 2030 or 2060. And then what are the goals, what are the measures, and key tasks. Secondly, there may be some supporting research, project research and so on.

Interviewer: Well, ok then, you are, if the government wants to publish policy ah or such things, and then you will provide technical support in the back. Is there something like that?

Respondent: Yeah, yeah, that's it.

Interviewer: white papers and stuff, you're in the back support. Wow, that's awesome, right? Investigate a topic and then write some reports. So you were, as I read your profile, studying abroad, did you start as an undergraduate? or did you go to graduate school?

Respondent: I was an undergraduate at Beijing Jiao tong University. Then we had a two-year exchange program, and I went to the U.S. after joining that program, which was equivalent to a dual degree - George Mason University and Beijing Jiao tong University. Then I applied to graduate school and went to Duke where there is a major in environmental economics under environmental management.

Interviewer: Oh, that's right. And your undergraduate degree is also about the environment?

Respondent: No, for undergraduate, I just studied economics. The undergraduate course is not so detailed. There is a branch of environmental economics. It is a kind of environmental economics course. Then the main thing is to study economics.

Interviewer: How do you feel about coming back to work after studying abroad? When you came back from abroad, how did you think about finding a job or something like that, and how did you plan yourself?

Respondent: Oh, at that time, when I first came back to China, it was because of my supervisor of my master's degree. He was doing a project in China, about household electricity, that is, a project related to electricity. Then I came back with him, and I was helping him to do some research or something. Then I didn't go back and started looking for a job in China. At first it was an international organisation. Called edf, I do not know if you have heard of it.

Interviewer: Seems to have not heard of, will check later.

Respondent: It is not the legal one EDF. I have worked for an international organisation in the United States. I spent a period there, then I felt that the general environment does have a kind of support to this industry. The whole country's point of direction, indeed, will start to pay more and more attention to this environmental field. However, as a person working in an international environmental organisation, I felt that the situation might not be the same in China as in foreign countries. In fact, I think there are more constraints. They must deal with the government and state-owned enterprises. A lot of dealings. The independence of the company is not very strong. Then I jumped out from there and came to this business now. And now the company will pay more attention to the project that can be landed. We will have products, and then services, and then really make energy saving and emission reduction become a reality, rather than always chanting slogans this way.

Interviewer: Oh, I see, now the work is specific: do some products, do some projects, and then those things really will be released. This is right, right, really quite good. What industries do you think Carbon-Neutral will mainly involve?

Respondent: The core areas of carbon neutrality are energy, heavy industry, transportation, construction, and agriculture, while the supporting areas, such as international cooperation, education, finance, law, consumption, uh and individuals can all be involved in the process of carbon neutrality. In terms of personal career development, I would recommend that individuals combine their original field with low carbon environmental protection, for example, traditional legal professionals can be involved in such areas as government environmental and climate legislation, corporate climate investment and financing legal risks, environmental technology litigation, carbon neutral legal news and media dissemination or regulatory consulting services. People in the field of architecture can also be engaged in, for example, landscape architects, building energy efficiency engineers, or green building materials research and development engineers…

Individuals can also participate in carbon neutral investments by participating in the carbon trading market. To invest in the carbon trading market, one needs to understand national policies, energy prices, background of carbon trading in different industries, etc., which requires a high comprehensive ability of investors. As the national carbon market incorporates more trading industries, the future direction of the local carbon market is very uncertain, and the policies and regulations will have a greater impact, so investors are advised to operate with caution.

You're a graduate student, right?

Interviewer: Oh, I forgot to introduce myself. Well, I came to Spain in... I came to Spain at 17 years old. And then I'm now twenty-two years old.

Respondent: That's young.

Interviewer: But there's still a lot to go. Then, I'm applying for graduate school, and now I'm in my senior year, and I'm writing this essay, and I have a month to turn it in. And then graduate school, I am…

Respondent: Are you now studying which major?

Interviewer: in my undergraduate, I am biased towards management and so on. Well, my undergraduate studies are innovative company management, and then my graduate studies were basically applying to sustainable management. Because I grew up, how do I put it? I grew up in Xi'an, and then I went to Shanghai in high school, so I have a lot of experience in this area. Because Xi'an is a heavy industrial city in the north, and since I was a child, the air is not particularly good, there is basically a lot of haze ah. If I rode a bike, there was a black substance in my nose. Then I wanted to change the current situation in China. Then and now uh I wrote a paper about uh on

the study of a lot of literature ah. Then I found that China's new energy industry, for example, photovoltaic, wind power, and energy storage, and power grid, and then ultra-high voltage. those projects, now under the state's policy support. The profitability is very good, but once there is less state support, then the profitability will immediately go down. And then that's very interesting. uh, and then I just think about studying it, is in this process, in this two-carbon double carbon process ah, is there any employment and investment opportunities for individuals. Basically, it's quite like your channel content.

Respondent: Well, so your thesis is about individual investment opportunities and employment directions or something basically that's it. Because a lot of people lost their jobs because of the epidemic, right, because a lot of companies went out of business.

Interviewer: I didn't really think about it that way at the beginning, but I wanted to do a survey on carbon neutral investment opportunities. And then I had to write about why I wanted to do this survey, and then I just basically came up with this idea.

Respondent: Well, it's still pretty good.

Interviewer: And then I will be a graduate student, I'm basically in the category of sustainable management from the current application statute. And then I might still study in Spain afterwards, and then I might also go to France afterwards. And I have an interview with a French school. Then it is a French business school called ESSEC, which is ranked second or third in France this way. And then that major is new this year.

Respondent: Well, yes. After all, there is still at least forty years of a development direction well. So, I think for you guys, it's a good opportunity. There are a lot of environment-related projects, and I see a lot of environment-related projects going on, not only in China, but also in China, which is a little bit behind. There are not too many environmental related courses at the undergraduate level in China, well, maybe environmental engineering and environmental science will have some courses. But there are very few schools like management and economics related. Because although we said domestic situations. How do you say it? This industry is still quite new. I think you just happen to be starting at the right time, just what policy now, no matter what, is very good.

Interviewer: Well, my thesis is to interview three people, and then the first one is in New Zealand. Well, he is in New Zealand's largest oil company. He is doing strategy planning from a management perspective. Then the second interviewee, she is a Fudan alumni, but almost twenty years ago. Then she was studying environmental engineering and so on. But at that time, the country did not have these policies of support, nobody cared about this environmental protection thing, and then she went to be a consultant. Now she regards it as at the right time, and she is ready to switch her

job to the field of carbon-neutral, and then do some help with employment issues. So we're really fortunate. And we should take this opportunity.

Respondent: Well, it is, indeed this just happens at an opportune time. And then it just so happens that the state has come up with it.

Interviewer: Hey, uh, I don't have any question. Uh, I think you've done very well on that channel, then how about talking about it. For example, you are a person who has lived abroad for a while, and then you feel because I am also quite curious, that is, after going back to China ah, including. For example, the Chinese people's awareness, awareness of environmental protection, do you think there is anything to help them achieve a more optimal point? Because some western countries have been taking measure for many years, like publicity and education, and then people can, for example, know the garbage classification ah, know the way to use more environmentally friendly products ah. Those things have been popular for many years, but what I know about China now is that it is relatively new. Do you have any thoughts on this? Is there anything that can be done to help the process, because it's important that it starts with everyone's daily life.

Respondent: Yes, well, yes, I think there are two extremes in terms of what people think about the environment. There is a group of people who feel that environmental protection is very, very important. Especially for the relatively young generation, they think we should do something to protect the environment and the earth, right? Then on the other hand, there is another group of people who may think, "I can't even afford to eat. Then come to do environmental protection. it may be a very noble thing for them. It's a little bit more of a reluctance. So, if we really do environmental protection, first of all, The cost of doing environmental protection should come down. I don't have to think too much, or spend too much money, and I can do the environmental protection thing. Well, then this may require some innovation in this area from the enterprise. And then there are some products that come out, and then everyone can, I'm willing to spend the money, and then I'm willing to pay that uh for the environmental protection things. But not too much. Because if your green premium is too high, people are very reluctant to feel that way. Yes, and now the country is uh also in some of the relevant ways to encourage it. Like uh they will have these kinds of policies as a goal. That is, if you do this kind of low-carbon travel, or you can go to recycle these wastes, then you can get some carbon credits. Then you can use these carbon credits to exchange for some goods or coupons. This will encourage you to do this kind of thing, like low carbon travel, low carbon environmental protection or uh some behaviour.

Well, I think this may still be uh relatively good, but this may be a relatively big problem. That is, this funding from where. it may still need to be from the government side, and then cooperate with the enterprise, and then let the enterprise be able to use their force to help everyone to optimise his behaviour. To the enterprise he actively assists the government with these projects. Maybe the company will also get some points ah uh

some carbon emission allowance ah what, these are all can intermingle a little bit. It is quite good that…

Interviewer: Because I want to study this sustainable development, there is also an aspect that Europe, or Europe and the United States in this area is really doing quite well. Then, you can get some experience. And then if you are working here and you have experience, and then if you return home, it will be more convenient to help domestic enterprises. And then to achieve, for example, the transformation of ESG ah, what investment ah this aspect of I think this this professional is still very promising.

END AUDIO