

Chinese Youth's Understanding and Practice of "Carbon Peak" and "Carbon Neutral"

Xiaofei Lai¹, Bin Zou^{2*}

¹ Research Center for Marxism and Social Development, Huaqiao University, Xiamen, Fujian, China

² Business School, Minnan Normal University, Zhangzhou, Fujian, China

*Corresponding Author.

Abstract:

Climate change is a common challenge facing the global community. At the two sessions in 2021, "carbon peak" and "carbon neutral" were written into the Work report of the Chinese government for the first time. This shows that the Chinese government has placed the construction of ecological civilization high on the national development plan. And firmly pursue the purpose of harmonious coexistence between man and nature. The research group compiled a questionnaire "Chinese Youth Energy Conservation and Emission Reduction Questionnaire", distributed 1000 questionnaires, and received 939 valid questionnaires. It is found that most Chinese youth have a certain understanding of "carbon peak" and "carbon neutral" knowledge; In terms of the ideology of energy conservation and emission reduction, 56.7 percent of Chinese youth regard "conservation awareness", "environmental protection awareness" and "ecological awareness" as "very important", "important" and "somewhat important". It shows that Chinese youth have a general consciousness of energy conservation and environmental protection. In terms of energy conservation and environmental protection, the most common behavior adopted by Chinese youth is "saving water", followed by "giving priority to using transportation", "giving priority to using new energy transportation", "timely turning off electricity to reduce electricity consumption" and "saving meals". Research shows that Chinese youth are taking action to realize the concept of energy conservation and environmental protection.

Keywords: Carbon Peak, Carbon Neutral, Understanding and Practice.

I. INTRODUCTION

Climate change is a common challenge facing the global community. [1] At the two sessions in 2021, "carbon peak" and "carbon neutral" were written into the Work report of the Chinese government for the first time. This shows that the Chinese government has placed the construction of ecological civilization high on the national development plan. And firmly pursue the purpose of harmonious coexistence between man and nature.

"Peak carbon" refers to the Chinese government's commitment to stop increasing carbon dioxide emissions until 2030 and gradually reduce them after that. "Carbon neutral" refers to the total amount of greenhouse gas emissions directly or indirectly produced by Chinese enterprises, organizations and

individuals within a certain period of time, and the offset of their own carbon dioxide emissions through afforestation, energy conservation and emission reduction, etc., so as to achieve zero carbon dioxide emissions. [2] At present, the world's major developed countries have reached the peak of carbon emissions, carbon emissions peak began to fall. [3] According to the U.S. Energy Information Administration (EIA), [4] U.S. carbon emissions peaked in 2007. According to world Bank statistics, [5] carbon emissions in the EU peaked in 1979 and have since fallen back. Since carbon emissions have peaked in most developed countries, most "peak carbon" and "carbon neutral" research has focused on developing countries. Of these, China is the most studied country. [6]

The TABLE I below shows the data and timing of carbon peaks in the United States, Japan, The United Kingdom, France, Canada, Spain and Australia. [7]

TABLE I. Data and timing of "carbon peak" in major developed countries.

Country	IN 1960			"Carbon Peak" Index			"Carbon Peak" Year
	Urbanization	Carbon Intensity (Tons/dollar)	Total Carbon Emission (One Hundred Million Tons)	Urbanization	Carbon Intensity (Tons/dollar)	Total Carbon Emission (One Hundred Million Tons)	
USA	70	0.91	28.91	80.27	0.39	57.89	2007
Japan	63.27	0.29	2.33	91.23	0.21	12.60	2013
UK	78.44	0.80	5.84	77.03	0.64	6.60	1971
France	61.88	0.46	2.71	73.21	0.36	5.29	1979
Canada	69.06	0.47	1.93	80.21	0.38	5.72	2006
Spain	56.57	0.22	0.49	77.74	0.24	3.55	2007
Australia	81.53	0.44	0.88	85.06	0.35	3.95	2009

According to statistics, [8] China's per capita GDP in 2020 will be about US \$10,504, still lagging behind that of medium-sized developed countries. At the same time, China's per capita carbon emissions in 2020 were about 6.98 tons, far lower than the average level of developed countries when carbon peaked. In general, China can and should have some room for carbon emission growth before carbon peak. [9]

The Chinese government attaches great importance to "carbon peak" and "carbon neutral". It has formulated a series of policies on energy conservation and emission reduction and introduced many specific

measures. At the same time, the Chinese government also attaches great importance to the publicity and education of ecological civilization, which has exerted a wide influence among young people.

The Chinese government points out that first of all, man and nature should coexist in harmony. Man and nature are a community of life. We must adhere to the principle of giving priority to conservation, protection and natural restoration. We should protect the ecological environment like we protect our eyes and treat it like we treat our lives. Secondly, lucid waters and lush mountains are invaluable assets. This shows that protecting the ecological environment means protecting productive forces, and improving the ecological environment means developing productive forces. Third, environment means people's livelihood, green mountains mean beauty and blue skies mean happiness. Developing the economy is for people's wellbeing, so is protecting the ecological environment. Ecological civilization is a cause shared by all the people. We need to translate the building of a beautiful China into voluntary action by all our people, so that everyone can protect, contribute to, and benefit from the environment. Fourth, we need to protect the environment with the strictest possible rules and regulations. Environmental protection must rely on institutions and the rule of law. Fifth, we need to work together to build a global ecological civilization. [10] The construction of ecological civilization is related to the future of mankind. Building a green home is the common dream of mankind. Protecting the ecological environment and tackling climate change require the joint efforts of all countries in the world. No country can stay aloof or immune.

From the above, we can see that the Chinese government attaches great importance to the protection of ecological environment. Then, what is the cognition level of "carbon peak" and "carbon neutral" among contemporary Chinese youth? By compiling a Questionnaire on Energy conservation and Emission reduction for Chinese youth, the research group analyzed the awareness and practice of "carbon peak" and "carbon neutral" among Chinese youth.

II. RESEARCH DESIGN

The research adopts the method of self-compiled questionnaire to compile "Chinese Youth Energy Conservation and Emission Reduction Questionnaire". Firstly, five universities are selected as sampling boxes according to the needs of samples. The specific method of sampling is to randomly select two to four classes in each school (the distribution of majors and grades of arts and science should be balanced as far as possible), and select two to four group leaders in each class to be responsible for issuing questionnaires. In order to compare the role of education, five hundred questionnaires were distributed to workers with less than college education in two factories, and a total of one thousand questionnaires were distributed.

The results of questionnaire recovery are shown in TABLE II below:

TABLE II. Sample description

Name	number (person)	Per Cent (%)
Factory Female	113	11.3
Factory Male	387	38.7

College female	282	28.2
College Male	218	21.8
Valid questionnaires	939	93.9
Missing	61	0.61
Total	1000	100

According to the research design, the measurement indexes in the questionnaire are shown in TABLE III below:

TABLE III. Measurement Indexes

The degree of Chinese youth's awareness of "carbon peak" and "carbon neutral"	Do you know what the following options mean? 1: What is "peak carbon"? 2: What is "carbon neutral"? 3. What is "peak carbon" and "carbon neutral"? (The options are likert scale: very well know, well know, a little know, a little don't know, don't know, very don't know)
Chinese youth consciousness of energy conservation and environmental protection	How important do you think the following concepts are: 1."Conservation awareness" 2. "environmental awareness" 3."ecological awareness ". (Likert Scale: Very important, important, somewhat important, somewhat unimportant, not important, very unimportant)
Chinese youth energy conservation and environmental protection behavior	In daily life, whether you have the following behavior: 1."Give priority to public transport" 2. "Give priority to new energy vehicles" 3. "Turn off electricity timely to reduce electricity consumption" 4. "saving water" 5. "Save meals" 6. "Waste Disposal & Recycling"

2.1 The Degree of Chinese Youth's Awareness of "Carbon Peak" and "Carbon Neutral"

The degree of Chinese youth's awareness of "carbon peak" and "carbon neutral" are shown in TABLE IV below:

TABLE IV. The degree of Chinese youth's awareness of "carbon peak" and "carbon neutral"

	What is "peak carbon"?		What is "carbon neutral"?		What is "peak carbon" and "carbon neutral"?	
	number of people	percent	number of people	percent	number of people	percent
very don't know	131	13.8	101	10.8	180	19.2
a little don't know	128	13.6	237	25.2	141	15.1
don't know, a little know	139	14.8	109	11.6	212	22.5
well know	282	30.0	231	24.6	230	24.4
very well know	102	10.9	122	13.0	103	11.0
very well know	157	16.8	139	14.8	73	7.8
Total	939	100	939	100	939	100

2.2 The Chinese Youth Consciousness of Energy Conservation and Environmental Protection

Chinese youth consciousness of energy conservation and environmental protection are shown in TABLE V below:

TABLE V. Chinese youth consciousness of energy conservation and environmental protection

	"Conservation awareness"		"environmental awareness"		" ecological " awareness	
	number of people	percent	number of people	percent	number of people	percent
very unimportant	131	13.8	151	16.1	80	8.5
somewhat unimportant	228	24.3	172	18.3	141	15.1
not important	139	14.8	109	11.6	212	22.5
somewhat important	182	19.4	256	27.3	230	24.4
important	102	10.9	122	13.0	103	11.0
very important	157	16.8	139	14.8	173	18.4
Total	939	100	939	100	939	100

2.3 The Chinese Youth Energy Conservation and Environmental Protection Behavior

Chinese youth energy conservation and environmental protection behavior are shown in TABLE VI below:

TABLE VI. Chinese youth energy conservation and environmental protection behavior

	"Give priority to public transport"	"Give priority to new energy vehicles"	"Turn off electricity timely to reduce electricity consumption"	"saving water"	"Save meals"	"Waste Disposal & Recycling"
number of people	785	633	642	893	598	532
percent	83.6	67.4	68.4	95.1	63.7	56.7

2.4 A Comparative Study Between College Students and Factory Youth

In order to study whether education improves the cognition of "carbon peak" and "carbon neutral" among Chinese youth, we use the data obtained from the questionnaire to compare whether there is a significant difference in the cognition of "carbon peak" and "carbon neutral" between college students and factory youth. We established the following research hypothesis:

Hypothesis: There is no significant difference in the cognition of "carbon peak" and "carbon neutral" between college students and factory youth.

For the hypothesis, we take two population mean tests and compare them through the independent sample T-test. Specifically, we extracted three questions from the questionnaire: A. What is "carbon peak"? B. What is "carbon neutral"? C. What is "peak carbon" and "carbon neutral"? To study whether there is a significant difference in the cognition degree of "carbon peak" and "carbon neutral" between college students and factory youth. The questionnaire used a six-level Likert scale, with options ranging from 1 to 6 being "very well know", "well know", "A little know", "A little don't know", "Don't know", and "very don't know". The analysis results are shown in TABLE VII below:

TABLE VII. Comparison of means

	Mean A	Mean B	Mean C
College students	1.59	1.68	2.06
Factory youth	2.18	2.39	3.16
T	-.432	-.397	-.507
Sig(two-tailed test)	.01		
Number of people	939		

From above, we can see that the mean values of A.B.C of college students are 1.59, 1.68 and 2.06 respectively, which are all smaller than those of factory youth. At the P level of .05 and .01, respectively. Therefore, there are significant differences between college students and factory youth in the recognition of "carbon peak" and "carbon neutral", and the recognition of "carbon peak" and "carbon neutral". The research hypothesis is rejected.

III. DISCUSSION

Through the above research, we find that, first of all the total proportion of Chinese youth on "carbon peak", "basic understanding", "relatively understanding" and "very understanding" accounted for 57.7 percent. The total proportion of "carbon neutral", "basic understanding", "relatively understanding" and "very understanding" reached 52.4 percent. Accounting for more than half. The total proportion of "basic understanding", "relatively understanding" and "very understanding" of the knowledge of "carbon peak" and "carbon neutral" reached 42.2 percent, nearly 50 percent.

Secondly, in terms of ideology, 57.1 percent of Chinese youth regard "very important", "important", and "somewhat important" as "saving consciousness". In terms of "environmental awareness", 55.1 percent said it was "very important", "important" and "somewhat important". In terms of "ecological awareness", 53.8 percent of the respondents said it was "very important", "important" and "somewhat important". The average value is 56.7 percent, indicating that Chinese youth have a general awareness of energy conservation and environmental protection.

Thirdly, in terms of energy conservation and environmental protection, the most common behavior adopted by Chinese youth is "saving water", accounting for 95.1 percent, followed by "giving priority to the use of transportation", accounting for 83.6 percent, "giving priority to the use of new energy transportation", "timely turning off electricity to reduce electricity consumption" and "saving meals", accounting for 67.4 percent, 68.4 percent and 63.7 percent respectively. "Waste Disposal & Recycling" accounted for more than 50 percent, reaching 56.7 percent. As shown in the figure 1 below:

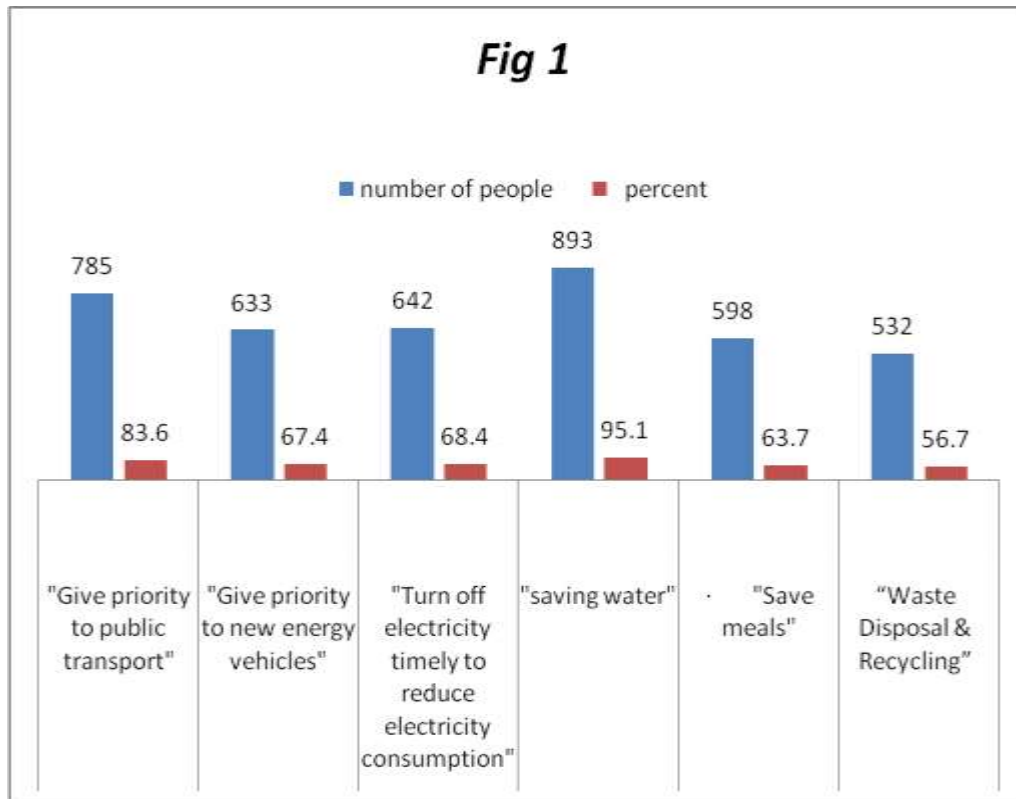


Fig 1. Energy conservation and environmental protection behavior analysis of Chinese youth

From the comparative study results of college student youth and factory youth, there are significant differences between college students and factory youth in the recognition of "carbon peak" and "carbon neutral", and the recognition of "carbon peak" and "carbon neutral". The cognition of college students is higher than that of factory youth. This suggests that education plays a significant role. This is related to the Chinese government's efforts to strengthen ecological civilization education among young people in universities in recent years.

The research shows that the ecological civilization thought has deeply influenced the contemporary Chinese youth. This is reflected in Chinese youth's high awareness of "carbon peak" and "carbon neutral" knowledge. In terms of ideology, the majority of Chinese youth have "saving consciousness", "environmental protection consciousness" and "ecological consciousness". In terms of energy conservation and environmental protection, a green and healthy lifestyle is influencing the behavior of Chinese youth. Chinese youth are using their actions to realize the concept of energy conservation and environmental protection, which shows that the Chinese government has achieved great results in the publicity and education of ecological civilization.

Finally, it should be pointed out that due to the limitation of funds and time, there are still areas to be improved in the sample number and sampling of this study. For example, we selected only two factories that were in industries that limited the educational attainment of youth in the factories. If high-tech

enterprises are selected for comparative analysis among enterprises, the results will be more convincing. In future studies, we will make more stratification of young people, so that the results of the study will cover young people of different occupational and educational levels.

VI. CONCLUSION

At present, the world is undergoing dramatic changes that have not occurred in more than a century, and the emergence of COVID-19 has exacerbated these changes. In this context, the world's youth face new social characteristics and historical challenges. For the youth of China, the rapid growth of national economy over the years not only greatly improves their quality of life, but also has a huge impact on their value identity, cultural identity and social identity in terms of ideology and psychology. How will they respond to these challenges? How do they view the common problems facing humanity, such as climate change and the COVID-19 pandemic? To answer these questions, we need to understand more about the psychology of youth in developing countries. Despite the impact of the COVID-19 pandemic, the economies of China have maintained strong growth until 2021, with Vietnam's 2020 growth rate of 2.91 percent, nearly 3 percent, and China's 2.31 percent. As emerging economies and developing countries take an ever larger share of the world economy, the collective rise of a large number of developing countries has become an important force influencing the international political and economic landscape. The representation and voice of developing countries in international affairs is expanding, and more attention should be paid to the youth of developing countries. We should do more empirical research, and make these empirical studies have more and more detailed stratified research. For example, stratified studies based on age, gender, education, income, value identity, etc., are an effective supplement to the current theoretical research from a grand perspective and are conducive to our understanding of the psychology of youth in developing countries. Although the developing countries selected in this study are representative to some extent, it is necessary to select more developing countries and conduct more detailed stratified studies in the future.

ACKNOWLEDGEMENTS

This research was supported by *the Special research project of Huaqiao University* (Grant No. TZYB-202001).

REFERENCES

- [1] IPCC. Climate change and land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial
- [2] The Energy and Climate Intelligence Unit. Net Zero Emissions Race. <https://eciu.net/netzerotracker>.
- [3] "World Urbanization Prospects" released by the Population Division of the United Nations Economic and Social Affairs Office.
- [4] United States Energy Information Administration. U. S. energy-related carbon dioxide emissions. Washington DC: United States Energy Information Administration, (2021-10-26). <https://www.eia.gov/totalenergy/data/monthly/#environme>
- [5] World Bank Databank.CO2 emissions: European. Union. Washington DC: World Bank, (2021-10-28).

- [6] IEC. The IEC and the Sustainable Development Goals. <https://www.iec.ch/sdgs>.
- [7] Shi Yulong, Guo Wei, International experience of promoting China's urbanization and carbon peak with high quality, *Ecological Economy*, Vol. 38, No. 4 (April 2022).
- [8] "China Statistical Yearbook 2020"
- [9] Ding Shuang etc. Development and Strategy of Standardization on Peak Carbon Dioxide Emission and Carbon Neutrality in China. *Academic Discussion*, Vol. 598, No.1 (Jan 2022)
- [10] Excerpts of Xi's Treatise on the Construction of Socialist Ecological Civilization. China Central Literature Publishing House, 2017