Analysis of Factors Influencing Carbon Neutrality Payment Intention: Taking Zhaotong City as an Example

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Abstract: In order to understand the influencing factors of Zhaotong residents' willingness to pay for carbon neutrality, and strengthen the idea and behavior of carbon neutrality consumption, this paper uses the method of sampling survey to analyze Zhaotong residents. A total of 522 valid sample data were received in this survey. Through statistical analysis and the establishment of a stepwise regression model, the study found that Zhaotong residents were influenced by environmental protection awareness or people around them, and they were more willing to participate in carbon neutral action. Boys had a higher willingness to pay than girls, which was related to the cognitive and personality characteristics. Age, education, occupation and income have a positive relationship with carbon neutral willingness to pay to a certain extent, that is, the higher the age, education, occupation and income, the stronger the carbon neutral willingness to pay.

Keywords: Carbon Neutrality; Willingness to Pay; Stepwise Regression; Influence Factor

1. Introduction

The Opinion on Fully Implementing the New Development Concept and Doing a Good Job in Carbon Peaking and Carbon Neutrality, issued on October 24, 2021, comprehensively and comprehensively plans and reasonably deploys the two major tasks of carbon dioxide peaking and carbon neutrality. The Action Plan for Carbon Peaking before 2030, issued on October 26, 2021, focuses on achieving the goal of peaking carbon dioxide emissions by 2030, Develop a scientific deployment to promote the peak of carbon dioxide emissions[1].

Starting from the willingness of consumers in Zhaotong City to pay for "carbon neutrality", this article collects the willingness of consumers in Zhaotong City to pay for "carbon neutrality" through a questionnaire survey method, and then obtains the relevant current situation of the willingness of consumers in Zhaotong City to pay for "carbon neutrality". Analyzing the factors that affect the willingness of residents in Zhaotong City to pay for "carbon neutrality" Provides useful basic data and decision-making information for the promotion of carbon neutrality products and related activities in Zhaotong City[2].

2. Analysis of the Current Situation of Consumers' Willingness to Pay for Carbon Neutrality in Zhaotong City

2.1 Sample Survey Questionnaire Design

The research created a survey on the willingness of consumers in Zhaotong to pay for carbon neutrality by using the QuestionStar platform, and distributed the survey through online platforms such as QQ and WeChat.

The survey on consumer willingness to pay for carbon neutrality in Zhaotong City consists of 19 questions and is divided into three parts[2].

A total of 525 questionnaires were distributed and 525 were recovered, of which 522 were valid. There were 256 boys and 266 girls; There were 24 under 18 years old, 174 between 18 and 30 years old, 179 between 30 and 50 years old, and 146 over 50 years old; 45 people at or below primary school, 199 people at junior high school or high school, 223 people at university or college level, and 51 people at master's degree or above; 124 in Zhaoyang District, 22 in Ludian County, 25 in Qiaojia county and 33 in Yongshan County;

Among them, there are 35 in Weixin County, 105 in Zhenxiong County, 30 in Yiliang County, 28 in Daguan County, 33 in Yanjin County, 41 in Shuifu city and 46 in Suijiang County; Heads of state organs, party and mass organizations and institutions 39, workers 54, agricultural workers 91, company employees 175, students 24, others 139; No income of 643000~5000 yuan, 197501~8000 yuan, 1468000 yuan or more 115. The questionnaire recovery rate was 100%, and the questionnaire efficiency was 99.42%.

The first part of the survey covers questions 1-6, which aim to understand the basic information of the respondents, including their age, education level, county of residence, occupation, and monthly income.

The second part is to measure the willingness of consumers in Zhaotong City to pay for "carbon neutrality". Questions 7-16. The indicators involved are shown in Table 1. The score of indicators is shown in Table 2:

Table 1 Relevant Indicators and Their Names

Meaning of indicators	Indicator naming
Consumer willingness to pay for carbon neutrality in Zhaotong City	Y
I will participate in environmental protection with practical actions	X_1
I think people around me are very willing to participate in environmental protection	X_2
I am very interested in carbon neutrality	X_3
I think carbon neutrality is very useful for protecting the environment	X_4
I hope to learn more about carbon neutrality	X_5
People around me will pay the cost for carbon neutrality products	X_6
I will promote and introduce carbon neutrality products to people around me	X_7
If the cost I paid for carbon neutrality products could be involved in the construction of environmental public welfare projects, I would think it would be very worthwhile	X_8
If my name appears in participating in carbon neutrality rankings, I	X_9

would be very happy	
I think carbon neutrality is a matter for the enterprises and celebrities, and it has nothing to do with me	X_{10}

Table 2 Measurement of Related Indicators and Their Scores

Indicator measurement	Score
Very disagree, Disagree, Average, Agree, Very agree	1,2,3,4,5
Very bad, Not very good, Average, Quite good, Very good	1,2,3,4,5
Completely unfamiliar, Not very familiar, Average, Familiar, Very familiar	1,2,3,4,5

The third part consists of items 17-19 to assist in determining the willingness of consumers in Zhaotong City to pay for carbon neutrality. It involves selecting key factors that affect participation in carbon neutrality, annual personal carbon neutrality budget, and how often carbon neutrality is planned, as shown in Table 3.

Table 3 Auxiliary Judgment Question Settings

Key factors affecting participation in carbon neutrality	Annual personal carbon neutral budget	Planning cycle of carbon neutralization
Government publicity efforts	<100	3 months
The publicity efforts of public welfare organizations	100~299	6 months
Carbon neutral product prices	300~499	9 months
Education received	>500	12 months
The influence of family, colleagues, and friends		Other
Education and advocacy in schools		
Other		

2.2 Testing of Sample Data Reliability and Validity

After collecting data, it is necessary to conduct reliability and validity tests to ensure that the collected data is valid and reliable, so that the collected data can be processed and analyzed in the future.

Use the Cronbach coefficient to determine the credibility of this questionnaire. If it is

between 0 and 1, and>0.8, it indicates that the measurement data can withstand repeated testing; Between 0.7 and 0.8, it indicates that the measurement data can withstand repeated testing; If it is within the range of 0.6~0.7, it indicates that the measurement data cannot withstand repeated testing and needs improvement. In short, the closer it is to 1, the higher the credibility of the collected data, which is more conducive to the subsequent data analysis work. The results of using IBM-SPSS Statistical analysis are shown in Table 4[3].

Using KMO value and Bartlett's sphericity test to test the validity of questionnaire measurement data, if the KMO value is higher than 0.8, it indicates that the measurement results can reflect the true characteristics of the measurement object well; If this value is between 0.7 and 0.8, it indicates that the measurement results can better reflect the true characteristics of the measured object; If this value is between 0.6 and 0.7, it indicates that the measurement results can generally reflect the true characteristics of the measured object; If this value is less than 0.6, it indicates that the measurement results can reflect the true characteristics of the measured object poorly. Validity analysis also requires Bartlett's test (corresponding p-value should be less than 0.05). The results of IBM-SPSS Statistical analysis are shown in Table 5.

Table 4 Reliability Statistics

Clone Bart Alpha	Number of items
0.871	10

Table 5 KMO and Bartlett's test

KMO sampling suitability quantity		.975
Bartlett's sphericity test	Approximate chi square	4907.143
	degree of freedom	45
	Significance	.000

According to Table 4, it can be seen that Cronbach α The coefficient is 0.871>0.8, indicating that the reliability of the questionnaire measurement data is highly reliable and can withstand repeated testing. Therefore, it is also highly credible for subsequent analysis and conclusions; According to Table 5, the KMO value is 0.975>0.8, and the P-value Sig is 0.000<0.05, indicating that the questionnaire data can well reflect the true characteristics of the measurement object and fully reflect the

content of the questionnaire to be studied[4].

2.3 Current Situation of Consumers' Willingness to Pay for "Carbon Neutrality" in Zhaotong City

The survey on consumer willingness to pay for "carbon neutrality" in Zhaotong City is basically a scoring question. The higher the total score, the higher the willingness to pay for "carbon neutrality". The highest score is 50 points, with 1-9 points being very dissatisfied, 10-19 points being dissatisfied, 20-30 points being average, 31-40 points being satisfied, and 41-50 points being very satisfied. The data shows that the average score of consumer willingness to pay for "carbon neutrality" in Zhaotong City is 36.62, It indicates that consumers in Zhaotong City still have a willingness to pay for carbon neutrality.

2.4 Valuation System for Consumer "Carbon Neutrality" Payment Intention Index in Zhaotong City

According to Table 6, the statistical description of the evaluation system for the willingness of consumers to pay for "carbon neutrality" in Zhaotong City can be obtained. Except for "I believe that carbon neutrality is a matter of enterprises and celebrities, and has nothing to do with me", the sample mean of all other indicators is higher than 3.0, indicating that consumers in Zhaotong City answer more positively than negatively to various indicators, Consumers have a high willingness to pay for carbon neutrality. Among them, the X_1 score of "I will participate in environmental protection with practical actions" is the highest at 3.92. Most of the surveyed consumers in Zhaotong City hope to participate in environmental protection with their actual actions, followed by the X_6 score of "people around me will pay for carbon neutrality and products" at 3.89, indicating that the carbon neutrality payment willingness of the surveyed consumers in Zhaotong City is influenced by the purchasing behavior of those around them, Again, "I hope to have a better understanding of carbon neutrality" X_5 is 3.84, followed by "I feel that people around me are willing to participate in environmental protection" X_2, "I will promote carbon neutrality products to people around me" X_7, and "If the cost I pay for carbon

neutrality products can participate in environmental protection public welfare projects, I will think it is very worthwhile" X_8 have the same number, with scores of 3.83, followed by "I am very interested in carbon neutrality" X_3 is 3.81, Next is "I think carbon neutrality is very effective in protecting the environment" with a score of 3.80, followed by "I would be very happy if my name appeared in the carbon neutrality ranking" with a score of 3.79. Most respondents had a lower willingness to see their name appear in the carbon neutrality ranking and bring happiness, while the lowest was "I think carbon neutrality is something that the enterprises and celebrities have nothing to do with me" with a score of 2.05, According to the layout and average score set by the options, it can be seen that the majority of respondents believe that carbon neutrality is a matter of the enterprises, and celebrities, and has nothing to do with individuals, indicating that the majority of respondents have a strong willingness to participate in carbon neutrality actions on their own.

Table 6. Statistical Description of Indicator Evaluation System

index	Indicator measurement	mean value	error	variance
X_1	1, 2, 3, 4, 5	3.92	1.237	1.529
X_2	1, 2, 3, 4, 5	3.83	1.072	1.150
X_3	1, 2, 3, 4, 5	3.81	1.011	1.023
X_4	1, 2, 3, 4, 5	3.80	1.120	1.255
X_5	1, 2, 3, 4, 5	3.84	1.078	1.162
X_6	1, 2, 3, 4, 5	3.89	1.071	1.146
X_7	1, 2, 3, 4, 5	3.83	1.057	1.117
X_8	1, 2, 3, 4, 5	3.83	1.051	1.104
X_9	1, 2, 3, 4, 5	3.79	1.064	1.132
X_{10}	1, 2, 3, 4, 5	2.05	1.204	1.449

2.5 Differences in Consumer Willingness to Pay for Carbon Neutrality in Zhaotong City

A cross analysis was conducted on the willingness to pay carbon neutrality based on the gender, age, education level, occupation, income, and carbon neutrality willingness of the respondents.

In terms of gender, women have a higher willingness to pay carbon neutrality than men, and women are more willing to purchase carbon neutrality products and related activities in real life; In terms of age, the willingness to pay for carbon neutrality among young and middle-aged people aged 20 to 50 is higher than that of residents in other age groups. Young and middle-aged people aged 20 to 50 are the main consumer group in our city, which shows that our city has huge potential for carbon neutrality consumption; In terms of education level, the willingness to pay for high school (including vocational schools, vocational schools, and technical schools) and undergraduate education is significantly higher than that of other education levels. This is because a large number of people in China have received high school education (including vocational schools, vocational schools, and technical schools) and undergraduate education. In recent years, the country has vigorously advocated ecological priority, and green development has gradually penetrated people's hearts. This is also true in education, Therefore, the number of people with this education level is high, and they have a strong willingness to pay for carbon neutrality; In terms of profession, the willingness to pay among employees of the company is higher than that of other professions, which may be due to the higher income of company employees who have more funds to purchase carbon neutral products and activities; In terms of income, there is a certain degree of proportional relationship between the level of income and the willingness to pay for carbon neutrality. Among them, those with an income of over 8000 have the strongest willingness to purchase carbon neutral products and activities[5].

3. Analysis of Factors Influencing Consumers' willingness to Pay for Carbon Neutrality in Zhaotong City

3.1 Stepwise Regression Analysis

This time, the stepwise regression analysis in IBM-SPSS Statistical multiple linear regression analysis was used.

The basic idea of stepwise regression is to have inputs and outputs. The specific approach is to introduce variables one by one, and after introducing an independent variable, the selected variables need to be tested one by one. When the original introduced variable becomes no longer significant due to subsequent variables, it needs to be removed.

Introducing a variable or removing a variable from the regression equation is a step in stepwise regression, and an F-test is required for each step, To ensure that the regression equation only contains significant variables before introducing new variables, this process is repeated until neither significant independent variables are selected into the regression equation nor insignificant equations are removed from the regression equation, ensuring that the final regression subset obtained is the optimal regression subset[6].

The issue that needs to be noted in stepwise regression is that the significance level values of introducing and removing independent variables are different. It is required that the significance level of introducing independent variables, entry, is smaller than the significance level of removing independent variables, otherwise a "dead cycle" may occur. That is, when entry is greater than or equal to removal, the significance P value of an independent variable is between entry and removal, and then this independent variable will be introduced, removed, introduced, and removed again, Cycle back and forth to infinity[6].

3.2 Analysis Process
3.2.1 Establishing a model
Establish a multiple regression equation between the various factors that affect consumers' willingness to pay for carbon neutrality in Zhaotong City and their willingness to pay.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots + \beta_{10} X_{10} + \varepsilon \qquad (1)$$

3.2.2 Perform stepwise regression
"I feel that people around me are willing to participate in environmental protection" X_2, "People around me will pay the cost for carbon neutrality products" X_6, "I will promote carbon neutrality products to people around me" X_7, "If the cost I pay for carbon neutrality products can participate in the construction of environmental public welfare projects, I will feel very worthwhile" X_8, "If my name appears in the carbon neutrality ranking, I will be very happy" X_9, "I believe that carbon neutrality is a matter for the enterprises and celebrities, and has nothing to do with me" X_{10}, and using IBM-SPSS Statistics to conduct stepwise regression analysis with consumer willingness to pay for carbon neutrality Y in Zhaotong City as the dependent variable (dependent variable). The stepwise regression results are shown in Tables 7 to 10.

As shown in Table 7, the first independent variable introduced was X_5, followed by X_3, X_4, X_1, X_2, X_6, X_9, X_3, and X_5. Variables X_1, X_3, X4, and X_5 were removed from the model, and the remaining six variables X_3, X_4, X_1, X_2, X_6, X_9, X_3, and X_5 were included in the model.

Table 7 Input/Remove Variables

model	Input variables	Excluded variables	method
1	X2	.	Step by step (condition: probability of F to be input<=. 050, probability of F to be removed>=. 100)
2	X6	.	Step by step (condition: probability of F to be input<=. 050, probability of F to be removed>=. 100)
3	X7	.	Step by step (condition: probability of F to be input<=. 050, probability of F to be removed>=. 100)
4	X8	.	Step by step (condition: probability of F to be input<=. 050, probability of F to be removed>=. 100)
5	X9	.	Step by step (condition: probability of F to be input<=. 050, probability of F to be removed>=. 100)
6	X10	.	Step by step (condition: probability of F to be input<=. 050, probability of F to be removed>=. 100)

Dependent variable: willingness to pay for carbon neutrality

3.2.3 Deriving the model
According to Table 8, the estimated parameters of the model, namely regression coefficients and normalization coefficients, are presented. The optimal model formula is obtained as follows:

$$Y = 0.863 + 0.172X_2 + 0.209X_6 + 0.168X_7 + 0.180X_8 + 0.142X_9 \quad (2)$$
$$-0.123X_{10}$$

Table 8 Model Parameter Estimation and Testing

	Unstandardized coefficient		Standardized Coefficient		
	B	error	Beta	t	significance
(constant)	.863	.337		2.485	.008
X_2	.172	.064	.148	2.672	.000
X_6	.209	.059	.179	3.559	.000
X_7	.168	.061	.143	2.760	.000
X_8	.180	.059	.156	3.067	.002
X_9	.142	.055	.123	2.566	.000
X_{10}	-.123	.051	-.119	-2.425	.000

3.3 Model Validation

3.3.1 Testing the goodness of fit of the model

It represents the proportion of variance explained by multiple independent variables in the total variance of the dependent variable, and measures the goodness of fit of a multiple regression model. In multiple linear regression, increasing the number of independent variables will affect the number of variance explained by the estimated regression equation in the dependent variable. Therefore, increasing the number of independent variables will reduce the prediction error, thereby reducing the sum of squared residuals (SSE). When SSE decreases, the sum of squared residuals (SSR) will increase, As a result, R_2 increases. If an independent variable is added to the model, even if it is not statistically significant, R_2 will still increase. Therefore, to avoid overestimating R_2 due to the increase in independent variables, statisticians propose adjusting R_2 using sample size n and independent variable k, and calculating the adjusted multiple coefficient of determination, denoted as R_{2a}[7].

Among them:

$$R^2 = \frac{SSR}{SST} = 1 - \frac{SSE}{SST} \quad (3)$$

$$R_a^2 = 1 - (1 - R^2) * \frac{n-1}{n-k-1} \quad (4)$$

Table 9 Model Summary

model	R	R^2	Adjusted R^2	Error in standard estimation	Durbin Watson
1	.693[a]	.480	.479	.892	
2	.736[b]	.539	.539	.839	
3	.752[c]	.563	.563	.818	
4	.759[d]	.576	.573	.808	
5	.763[e]	.583	.579	.802	
6	.767[f]	.588	.583	.799	1.900
a. Predictive variables: (constant), X_9					
b. Predictive variables: (constant), X_9, X_7					
c. Predictive variables: (constant), X_9, X_7, X_8					
d. Predictive variables: (constant), X_9, X_7, X_8, X_2					
e. Predictive variables: (constant), X_9, X_7, X_8, X_2, X_6					
f. Predictive variables: (constant), X_9, X_7, X_8, X_2, X_6, X_{10}					
j. Dependent variable: willingness to pay for carbon neutrality Y					

From Table 9, it can be seen that "I feel that people around me are willing to participate in environmental protection" X_2, "People around me will pay the cost for carbon neutrality products" X_6, "I will promote carbon neutrality products to people around me" X_7, "If the cost I pay for carbon neutrality products can participate in environmental public welfare project construction, I will feel very worthwhile" X_8, "If my name appears in the carbon neutrality ranking, I will be very happy" X_9, "I think carbon neutralization is a matter of enterprises and stars, and has nothing to do with me." X_{10}. The regression equation for the six independent variables X_{10} has an adjusted $R^2=0.583$, which is higher than the fitting degree of other models. This means that X_2, X_6, X_7, X_8, X_9, and X_{10} can

explain 58.3% of the change in willingness to pay for carbon neutrality[8].

3.3.2 F-test for significance of equation

Linear relationship test is a test of whether the relationship between the dependent variable Y and k independent variables is significant, also known as overall significance test. The following is an F-test of the optimal model formula derived from the influencing factors of consumers' willingness to pay for carbon neutrality in Zhaotong City[9]:

Propose hypothese: For any parameter β_i（$i = 1,2,3,4,5,6,7,8,9,10$）

$H_0 : \beta_0 = 0, \beta_1 = 0, \beta_2, = 0, ..., \beta_{10}$

$H_1 : \beta_0, \beta_1, \beta_2, ..., \beta_{10}$

Given a significance level of 0.05, calculate the F-test statistic:

$$F = \frac{\sum_{i=1}^{n}\left(Y_i - \hat{Y}\right)^2 / k}{\sum_{i=1}^{n}\left(Y_i - \hat{Y}\right)^2 / (n-k-1)} \quad (5)$$

Table10 Analysis of variance of the model

model	Sum of squares	freedom	mean square	F	significance
regression	468.123	6	78.020	122.316	.000^g
residual	323.489	515	.638		
total	796.621	521			
a. Dependent variable: willingness to pay for carbon neutrality Y					
j. Predictive variables: (constant), X$_2$, X$_6$, X$_7$, X$_8$, X$_9$, X$_{10}$					

Table 10 presents the analysis of variance table for the model, with F=122.316 and p=0.000<0.05, thus rejecting the null hypothesis[10]. This indicates that the willingness to pay for carbon neutrality is related to "I think people around me have strong environmental awareness" X$_2$, "People around me will purchase carbon neutrality products" X$_6$, "I will recommend carbon neutrality products to people around me" X$_7$, "If the funds I use to consume carbon neutrality can help environmental public welfare projects, I will think it is very worthwhile" X$_8$ If my name appeared on the carbon neutrality ranking, I would be very happy. There is a significant linear relationship between X$_9$ and X$_{10}$, indicating that the model is effective.

3.3.3 T-test for variable significance

To determine whether X$_2$, X$_6$, X$_7$, X$_8$, X$_9$, and X$_{10}$ have a significant impact on Y in each model, t-tests need to be performed on the regression β_i coefficients separately:

Propose hypotheses. For any parameter β_i（$i = 2,5,6,7,8,9$）

$H_0 : \beta_i = 0$

$H_1 : \beta_i \neq 0$

Calculate t-test statistics:

$$t = \frac{\hat{\beta}_j - \beta_j}{\sqrt{S_{\hat{\beta}_j}}} \sim t(n-k-1) \quad (6)$$

Given significance level α=0.05,Obtain critical value $t_{2/\alpha}$ *(n-k-1)*, Based on whether t meets:

$$|t| > t_{\frac{\alpha}{2}}(n-k-1)\left(|t| \leq t_{\frac{\alpha}{2}}(n-k-1)\right) \quad (7)$$

To determine whether to reject the original hypothesis.

Multicollinearity test and correlation test

Perform a correlation test on the sample data values using the DW test (Durbin Watson test) When the D-W statistic is between 1.5 and 2.5, it indicates no significant autocorrelation problem, and the closer it is to 2, the better.

$$DW = \frac{\sum_{t=2}^{n}(e_t - e_{t-1})}{\sum_{t=2}^{n} e_t^2} \quad (8)$$

$$e_t = y_t - \hat{y}_t \quad (9)$$

Table 11 Parameter estimation and testing of Model 9

model	Unstandardized coefficient B	Unstandardized coefficient Standard error	Standardized Coefficient Beta	t	significance	tolerance	VIF
(Constant)	.863	.337		2.485	.008		
X$_2$	.172	.064	.148	2.672	.000	.261	3.824
X$_6$	.209	.059	.179	3.559	.000	.318	3.144
X$_7$	.168	.061	.143	2.760	.000	.298	3.356
X$_8$	.180	.059	.156	3.067	.002	.309	3.240
X$_9$	.142	.055	.123	2.566	.000	.351	2.851
X$_{10}$	-.123	.051	-.119	-2.425	.000	.330	3.029

Use tolerance and variance inflation factor (VIF) to identify multicollinearity in the model. The tolerance of an independent variable is equal to 1 minus the decision coefficient of the linear regression model obtained by subtracting the independent variable as the dependent variable and the remaining k-1 independent variables as the predictor variables. That is, the smaller the tolerance, the more severe the multicollinearity. It is generally believed that when the tolerance is less than 0.1, There is severe multicollinearity. The variance amplification factor is equal to the reciprocal of the tolerance.

$$VIF = \frac{1}{1-R_i^2} \qquad (10)$$

The larger the VIF, the more severe the multicollinearity. Generally, strict VIF values greater than 5 indicate the presence of severe multicollinearity.

Finally, based on the analysis of Tables 9 and 11, it can be concluded that the D-W value in Table 9 is equal to 1.900 near the number 2, indicating that the model does not have autocorrelation and there is no correlation between the sample data. To test the multicollinearity of the model, if the tolerance in Table 11 is greater than 0.1 and the VIF value is less than 5, it indicates that there is no multicollinearity; so this model does not have the problem of multicollinearity.

4. Suggestions for Countermeasures

4.1 Policy Guidance

When formulating the "carbon emission reduction" policy, we should take into account the promotion of carbon neutral products and activities, advocate the development idea of "ecological priority and green development", and actively guide local enterprises and residents to participate in carbon neutral activities. According to the survey data, more than 90% of Zhaotong residents are willing to pay for carbon neutrality, indicating that most Zhaotong residents are willing to pay for "carbon emission reduction and carbon neutrality". Therefore, we can see that, In Zhaotong City, there is a public opinion basis for carbon neutralization market and carbon neutralization. Based on this, policies and measures with emission reduction efficiency,

operability and acceptability can play an effective, pragmatic, step-by-step and normalized role in guiding residents to prefer "carbon neutral" product consumption, and even pay the corresponding cost.

4.2 Enterprise Level

Based on the varying willingness of residents of different age groups to pay for carbon neutrality, targeted development and design of carbon neutrality products suitable for each age group. Among them, middle-aged and young people aged 20-50 have a greater willingness to pay for carbon neutrality compared to residents of other age groups. In addition, this age group is the main consumer group in our city, so relevant enterprises can focus on this age group, based on the demand for carbon neutral products among this age group, develop distinctive carbon neutral products according to their preferences to meet purchasing intentions, increase consumption desire, and increase consumption potential.

For residents with different levels of education, there is a positive relationship between education level and willingness to pay for carbon neutrality. Considering the current situation where the proportion of residents with higher education in our city is large but small, we should vigorously guide low educated students to continuously improve their education levels, expand the number of high educated students, and thus increase the consumption base of carbon neutrality products to expand their sales. At the same time, through learning, we should continuously improve our own understanding, In order to enhance the willingness to pay for carbon neutrality products, different levels of environmental protection knowledge are developed for promotion based on different academic backgrounds. Residents with different educational backgrounds have different perceptions of carbon neutrality and develop different practical, meaningful, and cost-effective carbon neutrality products to meet their awareness and needs for different carbon neutrality products. Therefore, to a certain extent, their consumption potential is stimulated, Thereby increasing their willingness to pay.

According to the observation and analysis of data collection, it can be seen that the monthly

income of residents has a positive impact on their willingness to pay for carbon neutrality, that is, there is a positive correlation between monthly income and willingness to pay for carbon neutrality. Therefore, based on the difference in monthly income of surveyed consumers, it is necessary to clearly recognize that a large part of the population in our city is the middle and low-end income group. Enterprises can provide targeted subsidies and rewards for employees who purchase carbon neutrality products, Increase employee willingness to purchase carbon neutral products; According to different monthly income levels, different consumption levels are formulated, and corresponding price ranges of carbon neutral products are designed to meet the requirements of different consumption levels. On the other hand, by increasing the monthly income of middle and low consumers, their income can be increased, thereby expanding the number of monthly income of middle and high consumers, expanding the carbon neutral consumption market, and ultimately improving the overall willingness of consumers to pay.

5. Conclusion

From the various indicators that affect consumers' willingness to pay for "carbon neutral" in Zhaotong, boys have a higher willingness to pay than girls, which is related to the cognitive and personality characteristics of boys and girls To some extent, age, education, occupation and income have a positive relationship with willingness to pay for carbon neutrality, that is, the higher the age, education, occupation and income, the stronger the willingness to pay for carbon neutrality. The regression results show that, "I think people around me have a strong awareness of environmental protection" X_2, "people around me will buy carbon neutral products" X_6, "I will recommend carbon neutral products to people around me" X_7 "If the money I spend on carbon neutralization can help environmental protection public welfare projects, I will feel very worthwhile." X_8. "If my name appears in the carbon neutralization ranking, I will be very happy." the regression coefficient is greater than 0, indicating that Zhaotong residents are more

willing to participate in carbon neutralization due to the impact of environmental protection awareness or people around them. While "I think carbon neutralization is a matter of enterprises and stars, and has nothing to do with me." X_{10} regression coefficient is negative, which reflects that we should deepen residents' awareness of carbon neutral payment through policy guidance and publicity.

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