Energy Crisis
-Wind Power Market in China

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The thesis was made to explore which price policy is the most suitable for the Chinese wind power market and to recommend one policy.

The research draws attention to the price policies. Two policies affect the Chinese wind power market at the same time, and the situation confuses the companies. Further investigations reveal that the percentage of people who think that the price policy decided by the concession project is bad and positively correlated to the age and education level. The percentage of people who think that the price policy which is based on the local price of coal is good is positively correlated to the age and education level, moreover, the first policy means that the price is fixed for 25 years, and the second policy means that the price changes with the market. These factors appear to be the major causes for choosing the second policy.

The Price policy of the Chinese wind power is the latest wind power policy range put forward by the National Development and Reform Commission. The report evaluates this range and concludes that it would be a policy to satisfy the wind power businesses. According to 76.36% of the 220 subjects tested recently, the second policy is the most suitable for the market.

It’s recommended:
• The second policy is suitable for the market
• It’s better to change the fixed years in the first policy.
Abstract

**Purpose/aim** The aim is to explore which price policy of the Chinese wind power is the most suitable for the market.

**Design/methodology/approach** Data has been collected through questionnaires. The analysis includes the statistical test in form of chi-square. Additionally the whole thesis followed the onion process put forward by Saunders.

**Findings** The analysis showed that the price policy which is based on the local price of coal is more suitable for the market than the price policy decided by concession projects.

**Originality/value** An original idea is given the relationship between ages, education levels and two policies. Further, the empirical data is collected from a comprehensive online-forum, so that the samples are randomly selected. The data shows that the businesses which want to enter the Chinese wind power market should choose the price policy which is based on the local price of coal. This choice should be useful in the real life.

**Key words:** wind power, price policy, concession projects, based on coal price, ages, education level
Acknowledgement

First of all, we would like to extend our sincere gratitude to our supervisor, Christer Nilsson, for his instructive advice and useful suggestions on our thesis. We are deeply grateful of his help in the completion of this thesis. High tribute shall be paid to Carin Hjalmarsson, whose profound knowledge of English triggers our love for this beautiful language and whose earnest attitude tells us how to learn English. We are also deeply indebted to all the other tutors and teachers in Högskolan for their direct and indirect help to us.

Finally, thanks to our group members for helping and discussing with each other.

Thank you.

Kristianstad, 2013

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Ch. 01 Introduction

In this chapter, we will talk about the problem, the problem description, the research purpose, the limitation, the research question and the outline of this research.

1.1. Problem
The problem is that there are two price policies for the Chinese wind power (Wang, Wen, Yang and Huang, 2011), but the government didn't say which policy is the best, and that is the reason why the businesses which want to enter the Chinese wind power market don't know which one to choose.

1.2. Problem description
We want to describe the problem like this: The price policy of the Chinese wind power is divided into two kinds: one is the price policy decided by concession projects, and the other one is the price policy which is based on the local price of coal (Wang, Wen, Yang and Huang, 2011). The price policy decided by concession projects is easy to understand, because the lowest price provider determines the wind-generated electricity price, but the price will be fixed for 25 years. The price policy, which is based on the local price of coal pricing, changes with the market (Wang, Wen, Yang and Huang, 2011). The businesses which want to enter the Chinese wind power market need to consider these two price policies. We will solve this problem in a later chapter.

1.3. Research purpose
The businesses which want to enter the Chinese wind power market want to know which policy is the best. Our final purpose is to solve the problem: which policy should be chosen.

1.4. Limitation
We also know how to limit the theory about the Chinese wind power market. The Chinese wind power market is affected by three main factors: position, products and policy (Lew, 2000), but we just choose the price policy (Wang, Wen, Yang and Huang, 2011), and use the price policy theory, the age
theory (Hervé and Mullet, 2009), and education theory (Baily and Hoskins, 2011). The empirics can be done in many different ways, but we just use the Chi-square test (Agresti and Finlay, 2009) and also the data can be collected in many different ways, but we just use the questionnaire.

1.5. Research question
We also need a research question and it is as follows: Which price policy should the businesses which want to enter the Chinese wind power market choose?

The different price policies for the Chinese wind power is considered as influential on the behavior of the Chinese wind power companies, so we will make hypotheses regarding these policies in a later chapter.

1.6. Outline
Chapter 1: Introduction chapter
Our thesis started with the introduction chapter. In the introduction chapter, the problem, the problem description, the research purpose, the limitation, and the outline were present.

Chapter 2: Background chapter
Then our thesis introduces the background. The history and situation were presented in this chapter.

Chapter 3: Literature review chapter
Then our thesis introduces the literature review chapter. The introduction, the first policy, the second policy and the summary of literature review were present in this chapter.

Chapter 4: Research method chapter
Then our thesis introduces the research method chapter. The sample, the operationalization and measures, the sample description and the method were present in this chapter.

Chapter 5: Empirics chapter
Then our thesis introduces the empirics chapter. The hypothesis of education levels and Policy 1, the hypothesis of ages and Policy 1,
the hypothesis of education levels and Policy 2 and the hypothesis of ages and Policy 2 were present in this chapter.

Chapter 6: Analysis chapter
Then our thesis introduces the analysis chapter. The statistic of ages, education level and the attitude towards policy 1 and policy 2 were present in this chapter.

Chapter 7: Discussion chapter
Then our thesis introduces the discussion chapter. The contributions and the result of hypotheses were present in this chapter.

Chapter 8: Conclusion chapter
The last chapter is the conclusion chapter, which summarized and finished up this thesis and pointed out the future research.
Ch. 02 Background

In the earlier chapter, we introduced the problem and research question. In this chapter, we will talk about the history and situation.

2.1 History
China’s energy resources are abundant, but China has a large population, so the resources per person in China are very low. Energy security and environmental protection have become global issues (Zhao, Yan, Zuo, Tian and Zilante, 2013). The world is seriously affected by energy crisis (Wei, Hui, Xin and Qiang, 2011) and the Chinese CO2 emissions have also become bigger. Chinese CO2 emissions in 1994 were 828 Mt C/yr, about 13.4% of the world total (Marland and Boden, 1997). The non-renewable energy decreases every year, and this has a positive impact on the environment because the use of coal, fuel and oil makes the environment worse. That is why China started to develop wind power many years ago (Lew, 2000).

2.2. Situation
The technique of wind power can already today be used to the full extent (Zhu and Hu, 2013), so China has begun to pay an increasing attention to renewable energy in general and wind power in particular, and has become the leading global investor in this sector (Zhao, Yan, Zuo, Tian and Zilante, 2013). Two main factors affect the Chinese wind power market: one is the price policy (Wang, Wen, Yang and Huang, 2011), another one is the product (Lew, 2000). The theory of the price policy (Wang, Wen, Yang and Huang, 2011) suggests that the price policy of the Chinese wind power can be divided into two kinds: one is the price policy decided by concession projects, and the other one is the price policy which is based on the local price of coal. The theory of the wind power product (Lew, 2000) suggests that products of wind power also can be divided into two parts: one is the large-scale machine, another one is the small-scale machine. The large-scale machine is hard to produce (Zhu and Hu, 2013), so the businesses which want to enter the business need to choose the better price policy. Therefore we just research the price policy of the Chinese wind power.
Ch. 03 Literature review

In chapter two we presented the problem, and now we need to make our hypotheses to test. We also take into consideration what other researches have written about the policies for the Chinese wind power.

3.1. Introduction
The price policy of the Chinese wind power research which was written by Wang, Wen, Yang and Huang didn't give much guidance for developing hypotheses about the age and the education level and their influence on the choice of policy. The researchers just talked about the different kinds of or the influence on the price policies (Wang, Wen, Yang and Huang, 2011; Wang, 2010). The older people consider more things than younger people (Hervé and Mullet, 2009), and people with higher education consider more than the people with lower education (Baily and Hoskins, 2011). In the earlier chapters, we described the theories about the price policies (Wang, Wen, Yang and Huang, 2011), and we will now make the hypotheses about the ages, education level and the price policy.

3.2. First policy
The large-scale wind power has been used directly in the industry since 2005 (Fang, Li and Wang, 2012). This means the businesses can enter the Chinese wind power market, so it is important for the businesses to know the policy (Wang, 2009). As we wrote in the earlier chapter, currently, there exist two pricing systems in China: one is the price policy decided by concession projects, and the other one is the price policy which is based on the local price of coal (Wang, Wen, Yang and Huang, 2011). With the price policy decided by concession project, the lowest price provider determines the price, and the price is fixed for 25 years. In this case we did the hypothesis about the ages, education level and people's attitude towards the policy.

H$_1$: Older people with a higher education think that the price policy decided by concession projects is not suitable for the Chinese wind power market.
3.3. Second policy

In this chapter, we introduced two price policies. The second one is the price policy which is based on the local price of coal (Wang, Wen, Yang and Huang, 2011). This means that the price changes with the market. In this case we followed the age theory (Hervé and Mullet, 2009) and education theory (Baily and Hoskins, 2011) to make this hypothesis.

\[ H_2 : \text{Older people with a higher education think that the price policy which is based on the local price of coal is suitable for the Chinese wind power market.} \]

3.4. Summary of Literature review

In this chapter, we talked about two polices. With the price policy decided by concession projects, the lowest price provider determines the price, and the price is fixed for 25 years. The second one is the price policy which is based on the local price of coal; the price changes with the market (Wang, Wen, Yang and Huang, 2011). We made the hypothesis regarding the price policy, ages and education levels. These are H1 and H2. Based on H1 and H2, we analyzed and made H3.

\[ H_3 : \text{The businesses which want to enter the Chinese wind power market would like to choose the price policy which is based on the local price of coal.} \]

The hypotheses need a method to test them and the whole thesis needs a research method, which we will present in the next chapter.
Ch. 04 Research Method

In the earlier chapters, we talked about the problem and made the hypotheses, but it's not enough, so we found the methods to do the thesis: the onion process put forward by Saunders and the Chi-square test put forward by Agresti and Finlay.

4.1. Method

In an earlier chapter, we explained that we need methods to follow. In our thesis, we research the wind power market in China, so we need methods to analyze our problems. This thesis is based on Saunders’(2003) theory about the research process “Onion”. The figure that follows has different layers which describe the different stages in a research methodology process. The layers of the "Onion" are the following: Research Philosophies, research approaches, research strategies, time horizons, and data collection method.

4.1.1. Research Philosophies

The way one thinks about development of knowledge will affect one's choice of research philosophy. There are three philosophies: positivism, interpretivism and realism (Saunders, 2003). The positivism means that the nature of thesis must have the articles to support, and it needn’t interfering. The interpretivism means that we can’t create a point: we need the problem that leads us to it. The realism means that the view is based on the independent human thoughts and beliefs which together create a reality.
Our thesis is based on the articles, and we also use the problem to lead to the result, and we want to create a reality.

4.1.2. Research approaches
There are two different ways: deductive approach or an inductive approach (Saunders, 2003). These two ways are ordered to give the reader a clear view. The price policy theory, age theory, and education theory are used in our theory.

We used the price policy theory all through the thesis, and the age theory and education theory are used in the empiric, analysis, discussion and conclusion.

4.1.3. Research strategies
Saunders claimed that how we answer the questions we have set was the strategies in 2003.

We used the Chi-square test (Agresti and Finlay, 2009) to test the hypotheses, and in the parts we follow the onion process, step by step (Saunders, 2003). We introduced, set problems, did hypotheses, used method, did empirics, analyzed, discussed and concluded it.

4.1.4. Time horizons
The time horizons mean that when you want to start and when you want to finish (Saunders, 2003). In our case we had three months to finish our thesis.

4.1.5. Data collection method
One of the most important elements in the research project is the data collection method. This method means good preparation and organization of collecting data in order not to face too much information collected. (Saunders, 2003)

We collected data from the questionnaires through a comprehensive online-forum and made the hypotheses to test what is the right situation. Through this we learned which method will be the best one for us to use, so we will use Chi-square test (Agresti and Finlay, 2009) to test the
hypotheses in the later chapter and follow the onion process (Saunders, 2003) in the whole thesis.

4.2. Operationalization and measures
We used the Chi-square test and table C (Agresti and Finlay, 2009) to test it, and two variables were used (ages and educations) to make the result more accurate.

1) One statement has been used for measuring the attitude towards the price policy decided by concession projects among the different education levels.

2) One statement has been used for measuring the attitude towards the price policy decided by concession projects among the different ages.

3) One statement has been used for measuring the attitude towards the price policy which is based on the local price of coal among the education levels.

4) One statement has been used for measuring the attitude towards the price policy which is based on the local price of coal among the different ages.

In a later chapter we will find that the measure included three levels of attitudes: Good, bad and not interested.

4.3. Sample
We presented our hypotheses in chapter three, and we need a method to test them, so we began with sampling. The study’s empirical object is different ages and education levels of people in society. The data was collected by a questionnaire. The questionnaire was put on a comprehensive online-forum, to guarantee a random sampling by this way. 1520 people saw the questionnaire, but just 220 people answered the questions. From these there are 15 people younger than 21 and 91 people are between 21-30 years old. There are 64 people between 31-40 and 50 people between 41-50, but there are 0 people older than 50. 42 of the respondents are Junior high school students in our thesis, 48 are Senior high school students, 80 have a Bachelor degree, and 50 have a Master degree, but 0 have a Doctoral degree. The result is shown in table 4.1 and 4.2.
4.4. Sample description

Before presenting the analysis of the Chi-square (Agresti and Finlay, 2009), the age composition and education level regarding the two price policies will be presented in table 4.1 and 4.2

<table>
<thead>
<tr>
<th>Table 4.1 Statistic of the ages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>Under 21</td>
</tr>
<tr>
<td>21-30</td>
</tr>
<tr>
<td>31-40</td>
</tr>
<tr>
<td>41-50</td>
</tr>
<tr>
<td>Over 50</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

People who are under 21 years old are 6.36 percent of the total number of respondents. People who are between 21-30 years old are 41.37 percent of the total number of respondents. People who are between 31-40 years old are 29.54 percent of the total number of respondents. People who are between 41-50 years old are 22.73 percent of the total number of respondents. People who are over 50 years old are 0 percent of the total number of respondents. (Table 4.1)

<table>
<thead>
<tr>
<th>Table 4.2 Statistic of the education levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>Under JHS</td>
</tr>
<tr>
<td>JHS</td>
</tr>
<tr>
<td>SHS</td>
</tr>
<tr>
<td>Bachelor</td>
</tr>
<tr>
<td>Master</td>
</tr>
<tr>
<td>Doctor</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

People who are under junior high school students are 0 percent of the total number of respondents. People who are junior high school students are 19.09 percent of the total number of respondents. People who are senior high school students are 21.82 percent of the total number of respondents. People who have bachelor degree are 36.36 percent of the total number of respondents. People who have master degree are 22.73 percent of the total number of respondents. (Table 4.2)
Ch. 05 Empirics

We understood to use methods to test the hypotheses in the earlier chapters. In this chapter the hypotheses will be examined. We will use “NI” to replace “Not Interested”, “JHS” to replace “Junior High School” “SHS” to replace “Senior High School” in this chapter.

5.1. Hypothesis of education levels and Policy 1.

$H_0$: There will be no difference depending on people’s education level and their attitude towards the price policy decided by concession projects.

$H_1$: There will be a difference.

Table 5.1 The attitude and education levels for Policy 1

<table>
<thead>
<tr>
<th>Education</th>
<th>JHS</th>
<th>SHS</th>
<th>Bachelor</th>
<th>Master</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>10</td>
<td>12</td>
<td>12</td>
<td>8</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>8.01</td>
<td>9.16</td>
<td>15.27</td>
<td>9.54</td>
<td>42</td>
</tr>
<tr>
<td>Bad</td>
<td>20</td>
<td>28</td>
<td>60</td>
<td>40</td>
<td>148</td>
</tr>
<tr>
<td></td>
<td>28.25</td>
<td>32.29</td>
<td>53.81</td>
<td>33.63</td>
<td>148</td>
</tr>
<tr>
<td>NI</td>
<td>12</td>
<td>8</td>
<td>8</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>5.72</td>
<td>6.54</td>
<td>10.9</td>
<td>6.81</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>48</td>
<td>80</td>
<td>50</td>
<td>220</td>
</tr>
</tbody>
</table>

5.1.1. Null hypothesis.

$H_0$: There will be no difference depending on people’s education level and their attitude towards the price policy decided by concession projects.

$H_1$: There will be a difference depending on people’s education level and their attitude towards the price policy decided by concession projects.

5.1.2. Statistical test.

When there are two categorical variables and they are taken from the independent random sampling, this Chi-square is appropriate.

5.1.3. Significance level.

Let $\alpha = 5\%$ and $N$ is the number of subject who participated in the study $= 220$.

5.1.4. Sampling distribution.

The sampling distribution of the statistic means that how large $\chi^2$ must be. If the size is large, the Chi-square can be tested. We also need the $df = (r - 1)(k - 1) = 6$ and table $C$ to conclude the result.

5.1.5. Rejection region.

The set of value of the statistic for which we reject the null
hypothesis when H0 is true is less than or equal to $\alpha = 5\%$.

5.1.6. Decision:
Table 4.2 (p.14) and 6.1 (p.23) present that the attitude towards the price policy decided by concession projects is correspondent to their education level. The numbers in the bracket indicate the expected number of people when H1 is true. Such as the education level of Senior high school students, the most percent of people who think that the price policy decided by concession projects is good.

When H1 is true we would expect $(42 \times 48)/220 = 9.16$ people to think that the price policy decided by concession projects is good. And the education level of Master, the people who think that the price policy decided by concession projects is bad, when H1 is true we would expect $(148 \times 50)/220 = 33.63$ people to think that the price policy decided by concession projects is bad. Of the 148 total numbers of people in all education levels, most of the people whose education level is master think the price policy decided by concession projects are bad.

$$\chi^2 = \sum \frac{(f_0 - f_e)^2}{f_e}$$
$$\chi^2 = 0.49 + 0.88 + 0.7 + 0.24 + 2.4 + 0.56 + 0.71$$
$$+ 1.2 + 7.91 + 0.32 + 0.77 + 3.39 = 19.57$$

$$df = (r - 1)(k - 1) = 6$$

Figure 5.1 The attitude and education levels for Policy 1

Reference to Appendix table C of Statistic methods (Agresti and Finlay, 2009), P-value $< 1\%$ $=>$ P-value $< 5\%$.

We found that our decision rejected H0.

There are differences depending on people’s education level and their attitude towards the price policy decided by concession projects.
Table 5.2. The attitude and ages for Policy 1

<table>
<thead>
<tr>
<th>Age</th>
<th>Under 21</th>
<th>21-30</th>
<th>31-40</th>
<th>Under 21</th>
<th>21-30</th>
<th>31-40</th>
<th>41-50</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>2</td>
<td>2.62</td>
<td>31</td>
<td>17.37</td>
<td>4</td>
<td>12.4</td>
<td>5</td>
<td>9.54</td>
</tr>
<tr>
<td>Bad</td>
<td>8</td>
<td>9.41</td>
<td>50</td>
<td>61.21</td>
<td>48</td>
<td>43.72</td>
<td>42</td>
<td>33.63</td>
</tr>
<tr>
<td>NI</td>
<td>4</td>
<td>1.9</td>
<td>10</td>
<td>12.4</td>
<td>13</td>
<td>8.86</td>
<td>3</td>
<td>6.81</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>91</td>
<td>65</td>
<td>50</td>
<td>220</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.2. Hypothesis of different ages and Policy 1.

H₀: There will be no difference depending on people’s age and their attitude towards the price policy decided by concession projects.

H₁: There will be a difference.

5.2.1. Null hypothesis.

H₀: There will be no difference depending on people’s ages and their attitude towards the price policy decided by concession projects.

H₁: There will be a difference depending on people’s ages and their attitude towards the price policy decided by concession projects.

5.2.2. Statistical test.

When there are two categorical variables and they are taken from the independent random sampling, this Chi-square is appropriate.

5.2.3. Significance level.

Let α = 5% and N is the number of subject who participated in the study = 220.

5.2.4. Sampling distribution.

The sampling distribution of the statistic means that how large \( \chi^2 \) must be. If the size is large, the Chi-square can be tested. We also need the \( df = (r - 1)(k - 1) = 6 \) and table C to conclude the result.

5.2.5. Rejection region.

The set of value of the statistic for which we reject the null hypothesis when H₀ is true is less than or equal to α = 5%.

5.2.6. Decision:

Table 4.1 (p.14) and 6.1 (p.23) present that the attitude towards the price policy decided by concession projects is correspondent to their ages. The numbers in the bracket indicate the expected number of people when H₁ is true. Such as in the age group from 21 to 30, the most percent of people who think that the price policy decided by concession projects is good.

When H₁ is true we would expect \( (42 \times 91)/220 = 17.37 \) people to think that the price policy decided by concession projects is good. In the age range 41-50, the people who think that the
price policy decided by concession projects is bad. When H1 is true we would expect \((148 \times 65)/220 = 43.72\) people to think that the price policy decided by concession projects is bad. Of the 148 total numbers of people in all age groups, most of the people between ages 41-50 think that the price policy decided by concession projects are bad.

\[
\chi^2 = \sum (f_0 - fe)^2 / fe \\
\chi^2 = 0.14 + 10.69 + 5.6 + 2.16 + 0.21 + 1.93 + 2.05 + 0.41 + 2.08 + 2.32 + 0.46 + 1.93 + 2.13 = 30.81
\]

\[df = (r - 1)(k - 1) = 6\]

Figure 5.2 The attitude and ages for Policy 1

Reference to Appendix table C of Statistic methods (Agresti and Finlay, 2009), P-value<1% => P-value<5%.

We found that our decision rejected H0.

There are differences depending on people’s age and their attitude towards the price policy decided by concession projects.

5.3. Hypothesis of education levels and Policy 2.

H0: There will be no difference depending on people’s education level and their attitude towards the price policy which is based on the local price of coal.

H1: There will be a difference.

Table 5.3 The attitude and education levels for Policy 2

<table>
<thead>
<tr>
<th>Education Level</th>
<th>JHS</th>
<th>SHS</th>
<th>Bachelor</th>
<th>Master</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>25</td>
<td>32.07</td>
<td>31</td>
<td>36.65</td>
<td>68</td>
</tr>
<tr>
<td>Bad</td>
<td>7</td>
<td>5.72</td>
<td>8</td>
<td>6.54</td>
<td>6</td>
</tr>
<tr>
<td>NI</td>
<td>10</td>
<td>4.2</td>
<td>9</td>
<td>4.8</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>48</td>
<td>80</td>
<td>50</td>
<td>220</td>
</tr>
</tbody>
</table>
5.3.1. **Null hypothesis.**

$H_0$: There will be no difference depending on people's education level and their attitude towards the price policy which is based on the local price of coal.

$H_1$: There will be a difference depending on people's education level and their attitude towards the price policy which is based on the local price of coal.

5.3.2. **Statistical test.**

When there are two categorical variables and they are taken from the independent random sampling, this Chi-square is appropriate.

5.3.3. **Significance level.**

Let $\alpha = 5\%$ and $N$ is the number of subject who participated in the study $= 220$.

5.3.4. **Sampling distribution.**

The sampling distribution of the statistic means that how large $\chi^2$ must be. If the size is large, the Chi-square can be tested. We also need the $df = (r - 1)(k - 1) = 6$ and table C to conclude the result.

5.3.5. **Rejection region.**

The set of value of the statistic for which we reject the null hypothesis when $H_0$ is true is less than or equal to $\alpha = 5\%$.

5.3.6. **Decision:**

Table 4.2 (p.14) and 6.2 (p.23) present that the attitude towards the price policy which is based on the local price of coal is correspondent to their education level. The numbers in the bracket indicate the expected number of people when $H_1$ is true. Such as the education level of Master, the most percent of people who think that the price policy which is based on the local price of coal is good.

When $H_1$ is true we would expect $(168 \times 50)/220 = 38.18$ people to think that the price policy which is based on the local price of coal is good. And the education level of Junior high school, the people who think that the price policy which is based on the local price of coal is good, When $H_1$ is true we would expect $(30 \times 42)/220 = 5.72$ people to think that the price policy which is based on the local price of coal is bad. Of the 168 total numbers of people in all education levels, most of the people whose education level is master think the price policy decided by concession projects are bad.

\[
\chi^2 = \frac{(f_0 - f_e)^2}{f_e}
\]

\[
\chi^2 = 1.55 + 0.87 + 0.78 + 0.88 + 1.28 + 0.32 + 2.22 + 1.15 + 8.01 + 3.68 + 0.5 + 1.8 = 23.04
\]

$df = (r - 1)(k - 1) = 6$
Reference to Appendix table C of Statistic methods (Agresti and Finlay, 2009), P-value<1% => P-value<5%.

We found that our decision rejected $H_0$.

There are differences depending on people's education level and their attitude towards the price policy which is based on the local price of coal.

5.4. Hypothesis of different ages and Policy 2.

$H_0$: There will be no difference depending on people’s age and their attitude towards the price policy which is based on the local price of coal.

$H_1$: There will be a difference.

Table 5.4 The attitude and ages for Policy 2

<table>
<thead>
<tr>
<th>Age</th>
<th>Under 21</th>
<th>21-30</th>
<th>31-40</th>
<th>41-50</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>7</td>
<td>70</td>
<td>48</td>
<td>43</td>
<td>168</td>
</tr>
<tr>
<td></td>
<td>10.69</td>
<td>69.49</td>
<td>49.63</td>
<td>38.18</td>
<td></td>
</tr>
<tr>
<td>Bad</td>
<td>6</td>
<td>5</td>
<td>13</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>1.9</td>
<td>12.4</td>
<td>8.86</td>
<td>6.81</td>
<td></td>
</tr>
<tr>
<td>NI</td>
<td>1</td>
<td>16</td>
<td>4</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>1.4</td>
<td>9.1</td>
<td>6.5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>91</td>
<td>65</td>
<td>50</td>
<td>220</td>
</tr>
</tbody>
</table>

5.4.1. Null hypothesis.

$H_0$: There will be no difference depending on people’s ages and their attitude towards the price policy which is based on the local price of coal.

$H_1$: There will be a difference depending on people’s ages and their attitude towards the price policy which is based on the local price of coal.

5.4.2. Statistical test.

When there are two categorical variables and they are taken from the independent random sampling, this Chi-square is appropriate.

5.4.3. Significance level.

Let $\alpha = 5\%$ and $N$ is the number of subject who participated in the study = 220.
5.4.4. Sampling distribution.
The sampling distribution of the statistic means that how large \( \chi^2 \) must be. If the size is large, the Chi-square can be tested. We also need the \( df = (r - 1)(k - 1) = 6 \) and table C to conclude the result.

5.4.5. Rejection region.
The set of value of the statistic for which we reject the null hypothesis when \( H_0 \) is true is less than or equal to \( \alpha = 5\% \).

5.4.6. Decision:
Table 4.1 (p.14) and 6.2 (p.23) present that the attitude towards the price policy which is based on the local price of coal is correspondent to their ages. The numbers in the bracket indicate the expected number of people when \( H_1 \) is true. Such as in the age group from 41 to 50, the most percent of the people who think that the price policy which is based on the local price of coal is good.

When \( H_1 \) is true we would expect \((168 \times 50)/220 = 38.18\) people to think that the price policy which is based on the local price of coal is good. In the age under 21, the people who think that the price policy which is based on the local price of coal is good, When \( H_1 \) is true we would expect \((30 \times 14)/220 = 1.9\) people to think that the price policy which is based on the local price of coal is bad. Of the 30 total numbers of people in all age groups, most of the people under the age of 21 think that the price policy which is based on the local price of coal is bad.

\[
\chi^2 = \frac{\sum (f_0 - f_e)^2}{f_e}
\]

\[
\chi^2 = 1.27 + 0.003 + 0.05 + 0.6 + 7.84 + 4.41 + 1.93
+ 0.09 + 0.01 + 6.9 + 0.96 + 3.2 = 27.263
\]

\[
df = (r - 1)(k - 1) = 6
\]

Figure 5.4 The attitude and ages for Policy 2

Reference to Appendix table C of Statistic methods (Agresti and Finlay, 2009), \( P\)-value < 1\% => \( P\)-value < 5\%.

We found that our decision rejected \( H_0 \).

There are differences depending on people’s age and their attitude towards the price policy which is based on the local price of coal.

We found all the data, but we couldn’t get the final result, so we will analyze this in the next chapter.
Ch. 06 Analysis

The tests we made in an earlier chapter will be analyzed in this chapter. We present the statistic of ages, education level and the attitude towards policy 1 and policy 2 (table 4.1, 4.2, 6.1 and 6.2). The statistics are presented in percent of the ages and education levels about attitude towards policy 1 and 2 are shown in table 6.3, 6.4, 6.5 and 6.6.

Table 6.1 Statistic of the attitude for policy 1

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>42</td>
<td>19.09</td>
</tr>
<tr>
<td>Bad</td>
<td>148</td>
<td>67.27</td>
</tr>
<tr>
<td>Not interested</td>
<td>30</td>
<td>13.64</td>
</tr>
<tr>
<td>Total</td>
<td>220</td>
<td>100</td>
</tr>
</tbody>
</table>

148 of the respondents think the policy 1 is bad; it is 67.27 percent of the total respondents. It means that most people think policy 1 is bad.

Table 6.2 Statistic of the attitude for policy 2

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>168</td>
<td>76.36</td>
</tr>
<tr>
<td>Bad</td>
<td>30</td>
<td>13.64</td>
</tr>
<tr>
<td>Not interested</td>
<td>22</td>
<td>10.00</td>
</tr>
<tr>
<td>Total</td>
<td>220</td>
<td>100</td>
</tr>
</tbody>
</table>

168 of the respondents think the policy 2 is good; it is 76.36 percent of the total respondents. It means that most people think policy 2 is good.

Hypothesis 1

Table 6.3 Statistics of the percentage of education levels for thinking policy 1 is bad

<table>
<thead>
<tr>
<th></th>
<th>JHS</th>
<th>SHS</th>
<th>Bachelor</th>
<th>Master</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bad</td>
<td>20</td>
<td>28</td>
<td>60</td>
<td>40</td>
<td>148</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>48</td>
<td>80</td>
<td>50</td>
<td>220</td>
</tr>
<tr>
<td>Percent</td>
<td>47.61</td>
<td>58.33</td>
<td>75.00</td>
<td>80.00</td>
<td>67.27</td>
</tr>
</tbody>
</table>

Hypothesis 1 has been tested with one chi-square (Agresti and Finlay, 2009). The result is presented in table 6.3. We know that more people with Master degree agree with the price policy decided by concession projects than people who has a different education level. The percentage of people who think that the price policy 1 is bad is positively correlated with the education level.
Hypothesis 2

Table 6.4 Statistics of the percentage of ages for thinking that policy 1 is bad

<table>
<thead>
<tr>
<th></th>
<th>Under 21</th>
<th>21-30</th>
<th>31-40</th>
<th>41-50</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bad</td>
<td>8</td>
<td>50</td>
<td>48</td>
<td>42</td>
<td>148</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>91</td>
<td>65</td>
<td>50</td>
<td>220</td>
</tr>
<tr>
<td>Percent</td>
<td>57.14</td>
<td>54.94</td>
<td>73.84</td>
<td>84.00</td>
<td>67.27</td>
</tr>
</tbody>
</table>

Hypothesis 2 has been tested with one chi-square. The result is presented in table 6.4. We know that more people who are between 41-50 years old agree with the price policy decided by concession projects than people who are under 41 years old. The percentage of people who think that the price policy 1 is bad is almost positively correlated with the ages.

Hypothesis 3

Table 6.5 Statistics of the percentage of education levels for thinking that policy 2 is good

<table>
<thead>
<tr>
<th></th>
<th>JHS</th>
<th>SHS</th>
<th>Bachelor</th>
<th>Master</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>25</td>
<td>31</td>
<td>68</td>
<td>44</td>
<td>168</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>48</td>
<td>80</td>
<td>50</td>
<td>220</td>
</tr>
<tr>
<td>Percent</td>
<td>59.92</td>
<td>64.58</td>
<td>85.00</td>
<td>88.00</td>
<td>76.36</td>
</tr>
</tbody>
</table>

Hypothesis 3 has been tested with one chi-square. The result is presented in table 6.5. We know that more people with Master degree agree that the price policy which is based on the local price of coal is better than people who have a different education level. The percentage of people who think that the price policy 2 is good is positively correlated with the education level.

Hypothesis 4

Table 6.6 Statistics of the percentage of ages for thinking policy 2 is good

<table>
<thead>
<tr>
<th></th>
<th>Under 21</th>
<th>21-30</th>
<th>31-40</th>
<th>41-50</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>7</td>
<td>70</td>
<td>48</td>
<td>43</td>
<td>168</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>91</td>
<td>65</td>
<td>50</td>
<td>220</td>
</tr>
<tr>
<td>Percent</td>
<td>50.00</td>
<td>76.92</td>
<td>73.84</td>
<td>86.00</td>
<td>76.36</td>
</tr>
</tbody>
</table>

Hypothesis 4 has been tested with one chi-square. The result is presented in table 6.6. We know that more people who are between 41-50 years old agree that the price policy which is based on the local price of coal is better
than people who are under 41 years old. The acceptance level of the people between 31-40 is less than the people between 21-30, but the difference is not so big, so the percentage of people who think that the price policy 2 is good is almost positively correlated with the ages. Older people with a higher education think that the price policy decided by concession projects is bad.

Older people with a higher education think that the price policy which is based on the local price of coal is good.

Now we have got the result, but it’s not the final result. This will be discussed in the next chapter.
Ch. 07 Discussion

From all the information reported in the earlier chapters the result is not complete, so we discuss them in this chapter. This thesis makes three contributions:

1) It provides that the price policy which is based on the local price of coal is more suitable for the Chinese wind power market than the price policy decided by concession projects.

2) It provides empirical knowledge to analyze the relationship between the ages and the attitude towards the two price policies of the Chinese wind power.

3) It shows that the most people who have a high education think that the price policy decided by concession projects is bad and the price policy which is based on the local price of coal is good.

The thesis argued at the beginning that the businesses which want to enter the Chinese wind power market don't know which policy to choose. An article said that the price policy decided by concession projects is good for the wind power market (Fang, Li and Wang, 2012), but it didn't show the whole data, so we want to use the result in the empirics to disagree with this view, because we think the price policy which is based on the local price of coal is the most suitable for the market.

We collected the data about different ages, different educations and their attitude towards the two policies and we got a result: Older people with a high education level think the price policy decided by concession projects is bad, and think the price policy which is based on the local price of coal is good.

We also found that the percentage of people who think that the price policy decided by concession projects is bad is positively correlated with the education level.

The percentage of people who think that the price policy decided by concession projects is bad is positively correlated with the ages. The
percentage of people who think that the price policy which is based on the local price of coal is good is positively correlated with the ages. The percentage of people who think that the price policy which is based on the local price of coal is good is positively correlated with the ages.

We focused on the ages and education levels about the two price policies, which we will conclude in the last chapter.
Ch. 08 Conclusion

In the earlier chapters, we presented introduction, background, hypotheses, methods, empirics, analysis and discussion. Now we want to conclude our thesis talking about different aspects.

Reliability
The reliability of our thesis can be said like this: Every view in our thesis is supported by articles. An advantage is the empirical data which we collected from a comprehensive online-forum, to guarantee a random sampling and include almost all the ages and education levels. In the earlier chapters, we made tests followed by chi-square test (Agresti and Finlay, 2009). The views and data are all reliable, and the result of the thesis can be used in the life and therefore is the conclusion.

Validity
The validity of our thesis can be said like this: The methods of our thesis follow the onion process (Saunders, 2003), and the empirics follow the Chi-square test (Agresti and Finlay, 2009), and so the conclusion is that our thesis is valid.

In an earlier chapter, we made 4 Chi-square tests; we got 2 results from these 4 tests. The older people with higher education think that the price policy decided by concession projects is bad.

The older people with higher education think that the price policy which is based on the local price of coal is good. If the price policy decided by concession projects can change the fixed years, the policy will be better.

Finally we can give the businesses which want to enter the Chinese wind power market an advice: the price policy which is based on the local price of coal is the most suitable for the market.

With this policy, the Chinese wind power market will be better. The shortage of energy in China can't be solved completely, but it can make some work.
Future research

Suggestions for the researches in the future are to continue focusing on the policy of the Chinese wind power. The wind power market of China is developing every day, more and more wind power resources are used very well. The policy and product of the Chinese wind power market are worth to research. Wind power is becoming the most popular non-renewable energy. It could be interesting to find out ways to reduce the shortage of energy.
Reference


Appendix

Questionnaire (English)

Energy crisis is an important question of the economy and society. It will seriously affect the social and economic development, so our study's purpose is to understand the situation of energy in China. The following questions are easy to understand, you can fill in it easily.

1. Age
   A. Under 21 years old    B. 21-30 years old
   C. 31- 40 years old      D. 41-50 years old
   E. Over 50 years old

2. Gender
   A. Male    B. Female

3. Education level:
   A. Under junior high school student    B. Junior high school student
   C. senior high school student          D. Bachelor degree
   E. Master                              F. Doctor

4. Do you think the wind power is a good energy source?
   A. Yes    B. No    C. Not good and not bad

5. Do you think the solar power is a good energy source?
   A. Yes    B. No    C. Not good and not bad

6. Do you think the nuclear power is a good energy source?
   A. Yes    B. No    C. Not good and not bad

7. Do you think the water power is a good energy source?
   A. Yes    B. No    C. Not good and not bad

8. Do you think there is a connection between energy and economy?
   A. Yes    B. No
9. To reduce the use of non-renewable energy, do you agree to develop renewable energy?
   A. Agree    B. Not agree    C. Not interested

10. Do you think China should develop the wind energy?
    A. Yes    B. No    C. Not interested

11. What do you think about the price policy which is based on the local price of coal? (The price is based on the market)
    A. Good    B. Bad    C. Not interested

12. What do you think about the price policy decided by concession projects? (The price is fixed for 25 years)
    A. Good    B. Bad    C. Not interested

13. Do you want to use the wind power in the future?
    A. Yes    B. No    C. Don't know

14. Do you try to save energy in your daily life?
    Please grade from 1-6 with a circle. 1= Never, 6= Every day
    1 --- 2 --- 3 --- 4 --- 5 --- 6

15. Is the wind power generation used widely in your city?
    A. Not used
    B. Use, but it isn't used widely.
    C. Yes, it is used widely.
    D. Don't know.
Questionnaire (Mandarin)

能源危机是一个关乎经济和社会的严重问题。这将我们的社会经济发展带来极大影响，所以我们的调查问卷的目的是了解中国能源的情况。接下来的问题很简单，你可以很容易的填写。

1. 年龄
   A. 21 岁以下  B. 21-30 岁
   C. 31-40 岁  D. 41-50 岁
   E. 50 岁以上

2. 性别
   A. 男  B. 女

3. 受教育程度:
   A. 初中以下  B. 初中
   C. 高中生  D. 本科
   E. 硕士  F. 博士

4. 你认为风能好吗?
   A. 好  B. 不好  C. 一般

5. 你认为太阳能好吗?
   A. 好  B. 不好  C. 一般

6. 你认为核能好吗?
   A. 好  B. 不好  C. 一般

7. 你认为水能好吗?
   A. 好  B. 不好  C. 一般

8. 你认为经济和能源之间有关系吗?
   A. 有  B. 没
9. 为了减少不可再生能源的使用，你愿意发展可再生能源吗？
   A. 同意    B. 不同意    C. 不感兴趣

10. 你认为中国应该发展风能吗？
    A. 是        B. 不        C. 不感兴趣

11. 你认为基于当地煤价的政府指导定价政策好吗? [价格跟着市场走]
    A. 好        B. 不好      C. 不感兴趣

12. 你认为特许招标电价好吗? [电价 15 年固定]
    A. 好        B. 不好      C. 不感兴趣

13. 你将来会用风能吗？
    A. 是        B. 不        C. 不知道

14. 平时你节能吗？
    打分 1-6. 1= 从不, 6= 每天
    1 --- 2 --- 3 --- 4 --- 5 --- 6

15. 你城市里面有风力发电吗？
    A. 没
    B. 有，但不多．
    C. 有，很多
    D. 不知道