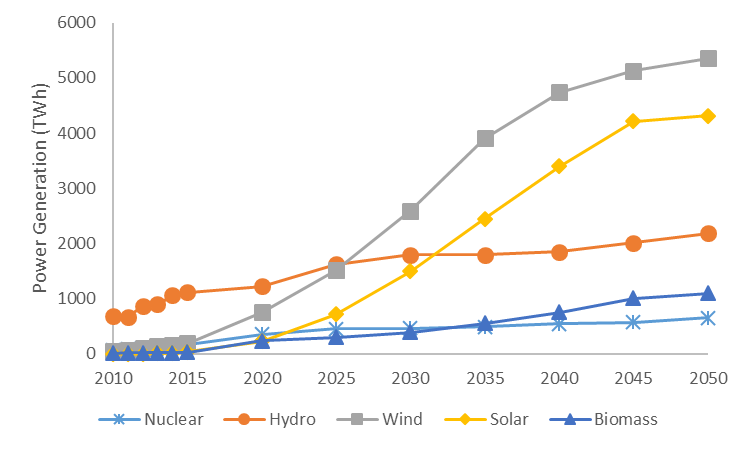
**Employment impacts of large-scale renewable energy expansion in China: A CGE based analysis**

**(Proposal 02/22/2017)**

#### Background

The development of renewable energy has featured prominently in China’s policy portfolio to deal with the climate challenges. The total installed capacity of renewable power in China saw booming development in the period of 12th Five-Year Plan (2010-2015), which increased from 249 GW in 2010 to approximately 499 GW in 2015. As pledged in the Intended Nationally Determined Contributions (INDC), the share of non-fossil energy in primary energy consumption will increase to approximately 15% and 20%, respectively, by 2020 and 2030. In parallel with those objectives, China’s powerful instruments such as Feed-in-Tariff (FIT) and Emission Trading Scheme (ETS) will lead to large-scale renewable power expansion in the coming decade. According to the research the National Development and Reform Commission of China (NDRC) [1], the renewable power is estimated to account for as much as 85.8% of the total power generation in 2050 (**Fig. 1**).



**Fig. 1: Historical and projected trends of non-fossil power generation in China**

Although policy makers tend to regard renewable energy as a panacea to cure more socio-economic problems than just climate change and a large numbers of studies have been working on supporting evidences for the existence of “Green Jobs” or “double dividend”, there are still deep concerns on the job destructing risks caused by the renewable policies. The concerns are supported by the standard economic theory [2], which warrants caution that stimulation on renewable energy will increase the overall energy costs and wrap the efficiency from in the whole economy. China’s practice of renewable policies also affirmed the increase of energy costs since there is an additional fee for each units of consumed electricity which is used to build a specific funding to cover the subsidies to renewable electricity generation. The additional renewable fee was set 0.001 Yuan/Kwh in 2006 and gradually increased to 0.019 Yuan/Kwh in 2016, which is up to 4% of the sale price of electricity. As a result, the risks of job destructing should not be ignored in the process of decision-making related to renewable policies. The employment effects should be clearly identified in order to avoid unexpected social costs, especially in the context that China’s facing challenges from both climate change and unprecedented economic downturn.

In this study, we attempt to build a comprehensive method based on Computable General Equilibrium (CGE) model that incorporates detailed renewable power technologies and considers the imperfection in labor markets. We quantify the impacts on employment in the China due to the large-scale expansion of renewable power in electricity sector. We focus on answering the following questions: 1) whether China will be a net gainer or loser in terms of employment change to deploy the renewable policies; and 2) how to expand the positive or to remove the negative employment impacts through suitable design on renewable policy instruments. The remainder of the paper is organized as follows. Section 2 gives a comprehensive review of the existing studies on the employment impacts of renewable impacts. Section 3 describes the model, database, and key assumptions used in the study. Section 4 provides a description of the INDC policy scenarios. Section 5 presents the main results. Section 6 provides a detailed discussion of the results, limitations of the study, and conclusions.

#### Literatures review

Due to the huge divergences on the whether employment impacts of renewables are positive or negative, we focus on exploring the reasons and sources for the opposite conclusions from existing studies in this section.

**Table 1** contains a list of studies reviewed, which touched on the employment impacts of renewable policies. Currently, there are mainly three approaches to study the employment impacts of renewable policies: 1) Input-output (IO) methods; 2) Analytical methods; and 3) Computable general equilibrium (CGE) methods. The advantages and disadvantages of each methodology has been well summarized in previous studies [3][4], but less attentions are paid to internal relations between the specific modeling characteristics with their conclusions on employment impacts. In fact, some assumptions in parallel with the methodologies may mislead the final conclusions, which is the major reason why there are researchers being still cautious while most studies tend to believe that the renewable policies can lead to positive impacts on the employment.

**Table 1: Review of the existing literatures**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year | Authors | Region | Method | Employment impacts |
| 2007 | Kuster et al.[5] | Global | CGE | Negative |
| 2008 | Allan et al.[6] | Scotland | CGE/IO | Positive |
| 2012 | Boehringer et al. [7] | Ontario, Canada | CGE | Negative |
| 2013 | Boehringer et al. [2] | German | Theoretical model/CGE | Positive or Negative |
| 2013 | Cansino et al. [8] | Andalusia, (southern Spain) | CGE | Positive |
| 2013 | Hoefnagels et al. [9] | Netherlands | CGE | Positive |
| 2013 | Rivers et al. [10] | US | CGE/analytical | Positive or Negative |
| 2014 | Allan et al. [11] | Scotland | CGE/IO | Positive |
| 2014 | Cansino et al. [12] | Spain | CGE | Positive |
| 2015 | Liu et al. [13] | China | CGE | Positive |
| 2015 | Ma et al. [14] | China | CGE | Positive |
| 2008 | Lehr et al. [15] | Germany | IO | Positive |
| 2008 | Neuwahl et al. [16] | EU | IO | Neutral |
| 2009 | Caldes et al. [17] | Spain | IO | Positive |
| 2011 | Cai et al.[18] | China | IO | Positive |
| 2011 | Tourkolias et al.[19] | Greece | IO | Positive |
| 2013 | Oliveira et al.[20] | Portugal | IO | Positive |
| 2013 | Wang et al.[21] | China | IO | Positive |
| 2014 | Cai et al.[22] | China | IO | Positive |
| 2016 | Behrens et al.[23] | Portugal | IO | Positive |
| 2016 | Guenther-Luebbers et al. [24] | Germany | IO | Positive |
| 2016 | Markandya et al. [25] | EU | IO | Positive |
| 2008 | Moreno et al. [26] | spain | Analytical | Positive |
| 2010 | Llera et al. [27] | spain | Analytical | Positive |
| 2010 | Wei et al. [28] | US | Analytical | Positive |
| 2012 | Grossmann et al. [29] | Global | Analytical | Positive |
| 2013 | Llera et al. [30] | Spanish/German | Analytical | Positive |
| 2015 | Ortega et al. [31] | EU | Analytical | Positive |
| 2015 | Sooriyaarachchi et al. [32] | Germany, Spain, the United States and the Middle Eastern region | Analytical | Positive |

On the one hand, the ways that employment impacts are measured can lead to the overly optimistic impression. For example, some analytical studies [15][27][28], which focus on the local and single sector issues, CGE studies [6][11] and IO studies[17][19], which focus on the regional and multi-sectors issues, measure the employment impacts using the gross effects (the total jobs being generated) versus the indirect effect (jobs created in one sector minus those destroyed in other sectors). Since the gross effects only include positive impacts and ignore the potential negative impacts, it is not surprise to draw a conclusion that more employment will be created along with the development of renewables.

On the other hand, there is a widespread “No-bounds” problem in the existing studies, especially in the IO based studies which commonly assume that supply is supposedly infinite and perfectly elastic. In this context, there are no bounds for the capacity of production so that the development of renewable technologies can be realized without any “opportunity costs”. As a result, the development of renewable energy can better stimulate the economic growth and finally create more employment since each unit electric power generation from renewable source need more inputs from value chain due to their relative higher production costs than fossil electric technologies. Here comes a fantastic logic that the more expensive is a technology, the more jobs it will create. That’s why Lesser [33] criticized that the ignorance of additional costs resulting from renewable supporting measures is ‘‘free-lunch economics’’.

Apart from the specific characters in parallel with methodologies, there are a few other factors that can influence the final judgements on employment impacts. The first one is the labor intensities of renewables, which are closely linked to the evaluation of direct employment impacts (jobs changes within the electricity sector). Most studies believe the renewable technologies have much higher labor intensities which means the renewable technologies need more workers to generate a unit of electric power compared with the conventional thermal power technologies. However, the data from Cai et al [18] show that the labor intensities of renewable power sectors are actually less than the coal-fired technology sector. The possible reason is most coal-fired power companies are state-own and are suffering from a lower efficiency compared with the newly-built renewable programs. Based on this set of data, Cai et al[18], Wang et al[21] and Cai et al[22] conclude with the negative direct employment impacts through the indirect employment impacts (jobs changes within the whole economy) are still positive. Secondly, the gap of skill requirements has also attracted increasing interests from researchers[5][15] [22][30][31][32], which emphasizes the risks of structural unemployment. If the labor market cannot support the personal qualities requirements by the deployment of renewables, the possibility of “Green Jobs” will be much lower than the expectation. Thirdly, the technical process is also a key factor affecting the employment impact. Some researchers [3] believe the improvement of energy efficiency and the learning effects of renewable technologies will help to promote the economic prosperity and consequently create new job opportunities, while the others [32] regard technical process as a threat to jobs since it leads the production towards automation. Finally, the rigidity of labor market becomes an important source for the theoretically possibility of positive employment impacts. As Boehringer et al [2] analyzed through a theoretical general equilibrium model, there will be double dividend only when there are initial labor market rigidities and suitable design on the level of subsidy rates and the financing mechanism. Even through, the employment impacts are most likely to be negative since the renewable policies increase the production costs and warp the economy away from the optimal status.

Considering both the specific characters of methodologies and other factors, the CGE models can provide a more comprehensive method to assess both direct and indirect employment impacts. CGE models, on the one hand, can hold the advantages of IO models by capturing the universal input-output relations between renewable sectors and other sectors, while, on the other hand, enable the subtle factor substitution in the production process and income effects in the consumption process caused by the policy shocks. As a result, it’s easy for CGE models to incorporate both the positive and negative impacts of renewable policies and present a more comprehensive picture for the policy makers.

Based on the above analysis, this study makes effort to cover several gaps in the existing literatures related to quantifying the employment impact of China’s renewable policies.

Firstly, our study will contribute to the modeling of China CGE models through incorporating labor rigidity and involuntary unemployment. It’s hard to evaluate the employment impacts using the standard CGE models, which are built with the neoclassical closure assuming a perfect labor market and no involuntary unemployment in the economy. Under this assumption, policy shocks would not cause any impacts on the overall employment but change the allocation of labor factors among sectors.

Secondly, our analysis highlights the importance of alternative policy instruments, which are ignored in most studies, to stimulate the expansion of renewable energy. Through improving the modeling of renewable electricity technologies and policy instruments, different policy-relevant options, including feed-in-tariffs and emission trading scheme, will be analyzed in our study. In this way, the resolutions of analysis will be largely improved than just focusing on the renewable targets.

Finally, our study helps to overcome major challenge banning CGE models from high-resolution assessment on employment impacts by establishing a set of data on the sectoral employment and wage in China, which incorporates both the statistical data from a national-scale demographic census and the survey data from an independent demographic research. This study, as well as other further researches, can be well supported by our dataset.

#### Methodology

The employment impacts of China’s renewable policies are analyzed here using the static version of China Hybrid Energy and Economic Research model (hereafter CHEER). CHEER model is a multi-sector CGE model calibrated to the Chinese economy and is developed as an extension of the Technology-Oriented Dynamic Computable General Equilibrium model for China (TDGE\_CHN) developed in Wang et al. [34]. Compared with other Chinese CGE model, there are more detailed exposition of the production structure, greater technological detail in the electricity sector, greater details regarding the labor market and richer options on the policy instruments. 18 production sectors (**Table 2**) are aggregated from 139 original sectors in Chinese input-output table. All those adjustments make the CHEER model a good tool to quantify the employment impacts of a variety of renewable policies.

**Table 2: Sectors in CHEER model**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No.** | **Sectors** | **Abbr.** | **No.** | **Sectors** | **Abbr.** |
| **1** | Electricity | Elec | **10** | Chemical industry | Chem |
| **2** | Coal and coking | Coal | **11** | Construction Materials | CM |
| **3** | Crude oil | Oil | **12** | Iron and Steel | IST |
| **4** | Petrochemical industry | Roil | **13** | Non-Ferrous Metals | NFM |
| **5** | Natural gas | Gas | **14** | Other Energy intensive industries | EII |
| **6** | Agriculture | Agri | **15** | Other manufacturing | OM |
| **7** | Other mining | Mine | **16** | Air Transport | Air |
| **8** | Food | Food | **17** | Other Transport | Tran |
| **9** | Paper industry | Paper | **18** | Services | Serv |

###### 3.1 Model structure

The CHEER model features a detailed production structure, which is captured by nested constant elasticity of the substitution (CES) production functions. Each sector is assumed to operate under constant returns to scale and cost optimization. The essential inputs of sectoral production include material inputs that generate the input/output table, as well as factor inputs representing value added. The possibilities of substitution among different inputs are controlled by sector-specific elasticities of substitution (σ).

Production of commodities, other than electricity, is shown in **Fig. 2**. Fixed factors, such as land and natural resources, are only required in the agriculture, coal, gas, oil and mining sectors, are treated as substitutes for other inputs to control short-term sectoral production at the top level of nested CES structure. At the lower two level, the energy factors are first combined with capital-labor aggregation, and then combined with intermediate inputs. The right-angle connections in the figure represents the fixed proportion input-output relationship, which is a special case of the CES function when σ=0.



**Fig. 2: Nested CES production structure of non-electricity sectors**

Given the paramount role of electricity sector for the employment impacts assessment of renewable policies, the representation of power production is by means of a more complex nested CES production structure (**Fig. 3**). The top nest of electricity production is a Leontief combination of power generation and power transmission and distribution. The production in power transmission and distribution is assumed to follow a fixed proportion of labor, capital and intermediate inputs. The production of power generation is competed by eight discrete technologies. Wind and solar PV are imperfect substitutes of baseload generation, due to intermittency. Baseload generation consists of power from conventional fossil fuels, nuclear energy, hydro energy, and biomass with perfect substitution. In the lower nest, each technology has a similar production structure as non-electricity sectors while only non-fossil power technologies need fixed factors as essential inputs.



**Fig. 3:** Nested CES production structure of the electricity sector

Consumption in the CHEER model assumes a single representative consumer incorporating household and government. All income, including labor compensation, capital remuneration, and tax revenue, is assumed to be distributed to the representative consumer. Disposable income is then allocated between consumption of goods/services and investment. Consumption is modeled using a nested CES consumption function (**Fig. 4)**. The top level assumes a Cobb-Douglas functional form for the tradeoff between consumption goods and investment goods. This assumption is based on the Solow–Swan theory, in which saving accounts for a constant share of total income. At the second level, income is allocated to specific consumption and investment commodities assuming constant elasticities of σC and σI, respectively. At the third level a further distinction is made between consumption of non-energy and energy commodities. This is intended to represent the idea that substitution between energy commodities is different than substitution between other consumption goods.

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**Fig. 4:** Nested CES structure of final demand

The treatment of international trade in the CHEER model follows the commonly used Armington assumption, which allows for import and export differentiation between domestic and international markets [35]. Domestic firms allocate domestic production to domestic and international markets using a constant elasticity of transformation (CET) function. Imports are substitutable with domestic goods using a CES function. Export demands and import supplies are set exogenously following the method of Wang et al. [34].

In order to take the labor rigidity into consideration, the CHEER model features a wage curve (**Equation 1**), which is used to describe the relationship between the unemployment rate and real wages in this model. and represent the unemployment rate after and before shock, respectively, while and represent the real wage. β is the core parameter in this equation and reflects the unemployment elasticity of the real wage. According to Blanchflower and Oswald (1995) [36], β is approximately -0.1 for any region or country. With the wage curve, the labor market may exhibit frictions with initial unemployment. The CHEER model further considers the inter-sectoral wage differentials and labor’s imperfect movement across sectors. constant elasticity of transformation (CET) functions are used to allocate the total labor supply among sectors. The equilibrium wage rate is determined by the labor market clearing condition equating labor supply and demand.

 **(1)**

Assumptions on factors other than labor are more straightforward. Both fixed factor and capital are modeled to be perfectly mobile across sectors and are controlled by supply functions with constant elasticity.

###### Chinese sectoral employment dataset

In order to match with data structure of CGE model, the objective of this section is to establish a dataset on the sectoral employment and wage. The available data sources include: 1) Chinese 6th population census [37], which is made in 2010 and provides the quantity of employment of different labor types in each sector; 2) Chinese Household Income Project (CHIP) [38], which is a household survey hold by Beijing Normal University with 26527 samples and provides the average wage for each labor type; and 3) Chinese 2012 Input-output table [39], which provides the total value of labor compensation in each sector. Based on the above data sources, up to 28 labor types by gender (male/female), by region (urban/rural), and by educational level (unlettered, elementary school, middle school, high school, junior college, regular college, postgraduate) can be identified. The wage data is shown in **Table 3**.

**Table 3:** Average wage for different labor types in China

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Gender** | **Region** | **Education** | **Wage**  **(Yuan)** | **No.** | Gender | **Region** | **Education** | **Wage (Yuan)** |
| L1 | Male | Urban | unlettered | 23431 | L15 | Female | Urban | unlettered | 14356 |
| L2 | elementary school | 26275 | L16 | elementary school | 18451 |
| L3 | middle school | 34098 | L17 | middle school | 23097 |
| L4 | high school | 39976 | L18 | high school | 31570 |
| L5 | junior college | 47648 | L19 | junior college | 36160 |
| L6 | regular college | 57187 | L20 | regular college | 46625 |
| L7 | postgraduate | 93353 | L21 | postgraduate | 68316 |
| L8 | Rural | unlettered | 17891 | L22 | Rural | unlettered | 12910 |
| L9 | elementary school | 21849 | L23 | elementary school | 16950 |
| L10 | middle school | 28150 | L24 | middle school | 20751 |
| L11 | high school | 30022 | L25 | high school | 23483 |
| L12 | junior college | 35971 | L26 | junior college | 29295 |
| L13 | regular college | 38878 | L27 | regular college | 33715 |
| L14 | postgraduate | 47189 | L28 | postgraduate | 28733 |

Theoretically, the relationship between labor compensation and employment quantity is shown as **Equation 2**. represents the compensation for labor *l* in sector *i*; represents the average wage for labor *l* in sector *i*; represents the quantity of labor *l* in sector *i*.

 **(2)**

The current database can only support the data required for . As a results, further works are needed to estimate the sectoral wage, , and sectoral labor compensation . Following the method used in Perter (2016) [41] for electricity data, we define a targeted matrix，X={}, where represents the targeted compensation for labor *l* in sector *i*. In order to get X, we first build an original matrix A={} based on the available data (, , ). represents the total value of labor compensation for sector *i*, which can be captured from Chinese 2012 Input-Output table. represents the employment quantity of labor *l* in sector *i*, which can be captured from the 6th population census. represents the average wage for labor *l*, which can be captured from 2013 Chinese Household Income Project (CHIP). In this way, the estimation of sectoral wage is converted to the optimal problem minimizing the difference between matrix A and matrix X under several constrains. The definitions of and are shown as followed.

 **(3)**

 **(4)**

In the definition of , the first item represents the relative wage rate of labor *l* to the average wage of all the labors, while the second item represents the average wage in sector *i*. Here is a key assumption that the relative wage rate of specific labor type is the consistent with the aggregated labor among sectors.In order to avoid the problem of scope inconsistency due to different data sources, the micro survey data are only used to calculate the relative wage rate instead of absolute value. The optimal problem can be represented as followed:

 **(5)**

S.t.  **(6)**

The objective function is built following the RAS method, which is a well-known method for data reconciliation. The constrain is to keep the consistency between the sum of sectoral labor compensation with the aggregated labor compensation in IO table. Through the above processes, we can get the targeted matrix X with sectoral labor compensation as well as balanced sectoral employment and sectoral wage for each labor type. In order to simplify the analysis, the 28 labor types are finally aggregated into two groups, skilled and unskilled, based on the education level in this study.

In order to distinguish the characters of different power generation technologies, the employment data of electricity sector are further disaggregated. Similarly, we first calculate the relative labor intensity based on the direct employment factors from Cai et al (2011) [18] and the share of labor skills based on the GTAP-Power data [41]. Assuming the wage of specific labor is consistent, the employment quantity of each technology can be estimated. The above data are presented in **Appendix A**.

###### 3.3 Other data and parameter

The CHEER model is calibrated to the 2012 input-output (I-O) table published by China’s National Bureau of Statistics (CNBS) [39]. Data on energy consumption are collected from the 2012 energy balance table [40]. The initial unemployment rates are calculation also based on the 6th national population census in China [37], which are 4.8% for the skilled labor and 2.7% for the unskilled labor.

The majority of the substitution elasticity parameters are taken from TDGE\_CHN, with necessary updates according to a recent review of the literature [42][43] (**Table 4**). Other important data related to the description of scenarios will be presented in the following section.

**Table 4: Core substitution elasticity parameters in CHEER model**

|  |  |
| --- | --- |
| **Parameter** | **Value** |
|  | 1 |
|  | 0.5 |
|  | Elec-0.81, Coal/Air/Tran/Serv-0.80, Oil/Gas-0.82, Roil-0.74,Agri/Mine-0.68, Other-0.94 |
|  | 0.5 |
|  | Coal-0.7, Oil/Mine -0.6, Gas-0.5, Wind-0.25, Solar/Biomass-0.2, Hydro-0.039, Nuclear- 0.025 |
|  | 0.25 |
|  | 0.3 |
|  | 0.4 |
|  | 0.25 |
|  | 1.5 |

#### Scenarios and Results

###### 4.1 Scenarios definition

We develop a Business-As-Usual (BAU) scenario and three policy scenarios representing different policy instruments in this study. The policy scenarios include (i) Feed-In-Tariff financed by additional electricity consumption fee (ECF); (ii) Feed-In-Tariff financed by lump-sum tax (LST) and; (iii) Feed-In-Tariff financed by a national emission trading scheme (ETS). The BAU scenario is constructed as a baseline for the analysis and there are no additional policies. The approach assumed in the ECF scenario is the current financial mechanism used in China, while LST and ETS scenarios provide two more well-known options. In each scenario, the renewable targets are set experimentally ranking from 10 GWh to 200 GWh and the FIT level will change endogenously. All four scenarios are briefly summarized in **Table 5.**

**Table 5:** Scenario description

|  |  |  |
| --- | --- | --- |
| **Scenarios** | **Description** | **Targets** |
| BAU | Business-As-Usual | N/A |
| ECF | FIT financed by electricity fees | Power generation from renewable sources increase from 10 GWh to 200GWh |
| LST | FIT financed by lump-sum tax |
| ETS | FIT financed by emission trading scheme |

###### Major results

1. What’s the direct and indirect employment impacts in each scenario?
2. Will the renewable policies significantly change the skills structure of labor market?

#### Discussion

1. In what situation are there the double dividend between employment and renewables?
2. Why do the renewable policies result in such employment impacts?
3. How to improve the performance of renewable policies?

#### Conclusion and implication

#### Appendix A. Data on Chinese sectoral employment and wage in 2012

Table A1：Chinese sectoral employment and wage in 2012

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sector** | **Skilled Labor** | | **Unskilled Labor** | |
| Employment Quantity (Thousand People) | Annual Wage (Yuan/Person) | Employment Quantity (Thousand People) | Annual Wage (Yuan/Person) |
| Elec | 1450.2 | 112761.8 | 2480.5 | 79323.4 |
| Coal | 573.1 | 173625.5 | 4576.8 | 115713.0 |
| Oilgas | 419.1 | 165925.4 | 695.6 | 117170.8 |
| Roil | 222.1 | 179664.7 | 347.9 | 125579.9 |
| Gas | 148.0 | 49998.4 | 346.8 | 34716.5 |
| Agri | 7081.4 | 26637.9 | 329439.3 | 15514.2 |
| mine | 232.4 | 206741.7 | 2118.0 | 132384.3 |
| Food | 1032.8 | 120163.3 | 8218.3 | 62994.8 |
| Paper | 208.3 | 70189.2 | 1980.9 | 47840.4 |
| Chem | 372.9 | 100010.5 | 1338.7 | 66630.0 |
| CM | 243.4 | 92135.5 | 2109.0 | 62466.3 |
| IST | 359.9 | 71652.0 | 1510.9 | 48782.7 |
| NFM | 195.3 | 162855.2 | 839.4 | 111736.7 |
| EII | 2567.1 | 122948.2 | 20209.6 | 66568.5 |
| OM | 11598.1 | 82219.8 | 109573.8 | 43356.7 |
| Air | 279.8 | 132826.2 | 183.4 | 90458.0 |
| Tran | 2270.7 | 64571.2 | 22039.2 | 36050.8 |
| Serv | 55969.5 | 94689.5 | 127397.6 | 36303.8 |

Table A2：Employment quantity of disaggregated electricity sectors in 2012

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Unit: Thousand People | T\_D | Coal\_Power | Gas\_Power | Oil\_Power | Nuclear | Hydro | Wind | Solar | Biomass |
| Skilled Labor | 526.5 | 659.2 | 11.3 | 1.3 | 8.1 | 224.6 | 5.2 | 0.2 | 13.7 |
| Unskilled Labor | 900.6 | 1127.6 | 19.3 | 2.2 | 13.9 | 384.1 | 9.0 | 0.4 | 23.4 |

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