Climate Regulations and Corporate Demand for ESG Talent*

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Abstract

Climate regulations aimed at environmental protection can reshape the corporate workforce. Using a comprehensive dataset of online job postings and a difference-in-differences framework, we find that highly polluting Chinese firms increased their demand for green-skilled employees following the introduction of China's first environmental tax law, especially in provinces with higher tax rates. This effect is stronger for firms with extensive public attention or substantial financial resources. Notably, firms with historically lower green hiring rates showed the greatest surge, indicating that environmental taxes accelerate the transition among lagging polluters. Moreover, firms that significantly increased green hiring also experienced higher levels of green innovation, highlighting the role of human capital in maximizing the impact of environmental policies.

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1 Introduction

Environmental protection and economic growth are two of the most pressing challenges for governments worldwide. Policies aimed at protecting the environment and promoting cleaner production technologies have emerged as pivotal solutions. With these policies, environmental risks can be mitigated without compromising long-term economic development (Acemoglu, Aghion, Bursztyn, and Hemous, 2012). Motivated by this view, researchers have examined the impact of environmental policies on the development of environmentally friendly products and green innovations (e.g., Acemoglu, Akcigit, Hanley, and Kerr, 2016; Aghion, Dechezleprêtre, Hémous, Martin, and Reenen, 2016).

A critical yet underexplored aspect of environmental policies is their impact on corporate labor strategies, particularly in shaping human capital development to ensure a more sustainable future. Central to this strategy are efforts to foster a workforce skilled in green technologies and practices.[1] Occupations in this category, commonly referred to as "green jobs", play a significant role in preserving or restoring the environment. These positions involve a wide range of responsibilities, ranging from water quality engineers to renewable energy scientists and from climate change analysts to sustainability managers. Without integrating such green-skill positions into their business models, companies will struggle to adhere to environmental regulations and contribute to a more sustainable economy. Thus, it is essential to understand how companies adjust their labor strategies in response to environmental regulations. Among various environmental policy instruments, taxes account for the largest proportion globally (OECD, 2024).

We fill this gap in the literature by studying how taxes on pollution emissions affect human capital in high-pollution firms. Specifically, we focus on China's Environmental Protection Tax Law implemented in 2018, which is first tax legislation in China specifically aimed at environmental protection. As this law imposes taxes on emissions, it economically motivates firms, especially those in polluting industries, to minimize their tax liabilities by investing in

[1] There has been an increasing focus on climate-related risks and opportunities in corporate labor policies in recent years. According to the PwC Global CEO Survey in 2024, more than two thirds of companies plan to upskill or reskill their workforce to better address the climate change megatrend (PwC, 2024).

greener production technologies.[2] Such an investment is not merely capital expenditure but also necessitates human capital development that can initiate, implement, and maintain green technologies. Consequently, firms are likely to seek employees with expertise in green skills to navigate this green transition effectively. These skills range from knowledge of renewable energy technologies to proficiency in sustainable waste management practices. Therefore, the implementation of the environmental tax law is likely to increase corporate demand for employees skilled at environmental sustainability. However, it is also plausible that the introduction of environmental taxes could reduce corporate demand for green talent. For example, firms may cut green hiring if the high costs of employing scarce green-skilled workers outweigh the benefits under new environmental tax schemes. In addition, firms might find it more cost-effective to outsource polluting activities to less regulated regions, reducing demand for green-skilled labor in firms facing stricter environmental taxes. Thus, the effect of environmental tax policies on corporate green hiring is ultimately an empirical question.

To answer this question, we construct a measure for corporate green hiring rates using a comprehensive dataset of online job postings in mainland China. We identify job postings that require green skills by textual analysis of job descriptions. Our data shows a substantial growth in the share of green job postings during our sample period between 2015 and 2021, consistent with the view that green jobs have taken off in China in recent years.[3] With this proxy for green hiring, we investigate how the implementation of China's environmental protection tax law affects corporate demand for green talent. We employ a difference-in-differences (DiD) approach to establish causality. In our analysis, the treatment group consists of companies in highly polluting industries, which are subject to higher pollution-induced tax burdens, whereas the control group consists of the remaining firms.

[2] Anecdotal evidence confirms this conjecture. For example, in response to the environmental tax law, Shanghai Shangyao Xingling Pharmaceutical Co., Ltd. invested heavily in research and development to optimize wastewater treatment. Due to the newly developed technology, they were able to increase the degradation rate of COD to 99%, resulting in a reduction of approximately 30% in environmental tax payments. Please click here for more details.

[3] Please refer to https://chinadialogue.net/en/business/green-jobs-take-off-china/ for details. The rapid growth in the demand for green skills is observed in other countries as well. For instance, the Global Green Skill Report issued by LinkedIn (2023) suggests that the median growth in LinkedIn job postings requiring at least one green skill between February 2022 and February 2023 is 15.2%.

We first document that environmental taxes have a significant stimulating effect on corporate green hiring. This effect persists even after controlling for a wide range of time-varying firm-level determinants of companies' recruitment decisions (e.g., firm size, profitability, and financial conditions), any time-specific factor, and any time-invariant firm-specific factor. We show that environmental taxation increases the share of green job postings by 0.672 percentage points among highly polluting firms compared with other firms, which corresponds to 22.19% of the average share of green job postings in our sample. We obtain stronger results after taking into account unobserved heterogeneities in time-varying location-specific characteristics. A dynamic DiD analysis further shows that there is no change in corporate recruitment strategies prior to the implementation of the 2018 environmental tax law, and the surge in polluting firms' demand for green-skilled job candidates only becomes significant post-enactment. Our robustness checks using alternative measures of green hiring and excluding companies with special treatment yield similar findings. With pseudo treatment firms, we find no significant impacts of environmental taxes on corporate green hiring rates, suggesting that our baseline results are unlikely to be driven by chance.

The environmental protection tax law in China allows provincial autonomy to set tax rates, resulting in considerable variation in tax rates across provinces. Exploiting such variations, we investigate how the human capital effects of environmental taxes vary with the level of the tax rate. Specifically, we divide our sample into regions with below and above the median environmental tax rate. We find that in areas with relatively high environmental tax rates, there is a notable positive relation between taxes and the share of green job postings among high-polluting firms. In contrast, this effect is not significant in regions with relatively low tax rates. This suggests that higher environmental taxes effectively incentivize high-polluting firms to adopt greener recruitment strategies.[4] The findings highlight the importance of the tax level in influencing corporate behavior towards more sustainable activities, suggesting that the effectiveness of environmental taxation in promoting green employment depends significantly on the stringency of the tax measure.

[4] The evidence is consistent with the idea that the costs of regulatory compliance increase with enforcement (e.g., Trebbi, Zhang, and Simkovic, 2023).

We explore cross-sectional variation in our baseline finding to shed light on the motivators of corporate green transition in relation to the environmental tax law. We first consider the impact of public attention. Using Baidu Search Volume Index and media coverage as measures for public attention, we document that a high level of public attention significantly enhances the effect of environmental taxes on green hiring rates in highly polluting firms. In contrast, firms receiving less public scrutiny show negligible change in their green recruitment practices following the introduction of environmental taxes. These findings suggest that societal engagement and awareness, alongside regulatory pressures, are vital in driving firms, especially those in polluting industries, to hire more green talent.

We then investigate the role of financial constraints. This analysis classifies companies into financially constrained and unconstrained groups based on their SA index (Hadlock and Pierce, 2010). Our results show that polluting firms with fewer financial constraints are more responsive to environmental tax policies and experience a significant increase in the share of green job postings. Conversely, financially constrained firms exhibit a limited response to these environmental tax policies. This disparity highlights the significance of a firm's financial health in its ability to transition towards green practices.

We also consider the role of firms' experience of tax avoidance, which has long been a significant strategy for companies in China (e.g., Cai and Liu, 2009; Clayton, Coppola, Dos Santos, Maggiori, and Schreger, 2023). These practices vary among firms, depending on their unique motivation and capability to circumvent tax obligations. One might expect firms that are proficient in tax avoidance would rely more on tax evasion rather than increase their green hiring in response to the implementation of environmental taxes. We confirm this conjecture in our sample. We find that the positive effects of the environmental protection tax law are less pronounced among firms more skilled at tax evasion.

We further examine whether the environmental tax law encourages firms that are less engaged in green hiring prior to the law to catch up with firms that are more engaged. To do so, we split our sample based on firms' historical average shares of green job postings before the implementation of the environmental tax law. We find that the stimulating effects of environmental taxes are primarily concentrated among firms with low green hiring rates before

the law is introduced. This result suggests that environmental taxes are effective in motivating green shifts of workforce in firms that have lagged behind in hiring employees with green skills, as well as reducing the gap in the green transition between firms.

Finally, we assess the impact of hiring employees with green skills on firm performance, with a focus on profitability and green innovation. Our analysis reveals that firms adopting green hiring practices after the environmental tax law show increased profitability, particularly those with a significant rise in green hires. Moreover, firms with significant increases in green hiring rates show higher levels of green innovation, while this effect is absent in firms with minimal changes in green hiring. Essentially, the environmental tax law primarily enhances green innovation and profitability in firms that actively expand their base of green-skilled employees.

This paper contributes to the literature on how environmental regulations affect corporate behavior. Dang, Gao, and Yu (2023) find that a cap-and-trade program aimed at reducing the NOx emissions from power plants causes U.S. firms to lower their financial leverage. Choi, Levine, Park, and Xu (2024) document that adverse cash flow shocks arising from more stringent environmental regulations generally lead firms to reduce CEO incentive compensation. Dai, Duan, and Ng (2021) show that stringent environmental regulations promote corporate green innovation in the United States. Similarly, Calel and Dechezleprêtre (2016) demonstrate that the Emission Trading System in the European Union creates incentives to companies to increase their green innovations. Brown, Martinsson, and Thomann (2022) exploit the cross-country differences in taxes on sulfur oxide (SO_x) emissions among OECD countries and document that firms in countries with higher pollution taxes invest more in research and development (R&D). By analyzing a global dataset, Li, Tang, and Xie (2023) document that national laws aimed at mitigating climate change reduce cross-border acquisition activities. Prior studies have also examined the effects of environmental regulations on various other corporate decisions, including pollution abatement (Ramadorai and Zeni, 2024), the location of carbon emissions (Ben-David, Jang, Kleimeier, and Viehs, 2021; Bartram, Hou, and Kim, 2022), the substitution among different types of pollution (Gibson, 2019), greenwashing activities (Hu, Wang, and Du, 2023), and firms' participation in philanthropy

(Choi, Park, and Xu, 2022). This paper, to our best knowledge, is the first one to document that environmental protection regulations shape corporate hiring policies.

In addition, our paper adds to studies that examine the green transition of corporate workforces. Curtis and Marinescu (2022) document a rapid growth of green energy jobs in the United States since 2010. Darendeli, Law, and Shen (2022) show that U.S. firms hiring more employees with green skills subsequently have higher profitability and generate more green patents. These firms also have lower toxic emissions, especially when the job positions are located at the emitting facilities instead of at the firm's headquarters (Hagendorff, Nguyen, and Sila, 2023). Chen (2022) demonstrates that firms with a higher demand for workers who facilitate their green transition attract more socially responsible investors. Distinct from existing studies, we focus on corporate demand for green skills in China and highlight the role of environmental taxes in driving such demand.

More broadly, our findings contribute to research on changes in the demand for labor skills. Existing studies have shown that such changes could stem from a variety of factors such as technological advancement (e.g., Autor, Levy, and Murnane, 2003; Michaels, Natraj, and Van Reenen, 2014; Acemoglu, Autor, Hazell, and Restrepo, 2022), variations in labor availability (Modestino, Shoag, and Balance, 2020), trade shocks (Lu and Ng, 2013), changes in consumer preferences (Autor and Dorn, 2013), and statutory increases in minimum wage (Clemens, Kahn, and Meer, 2021). Our paper adds to this literature by highlighting the role of climate regulations in shaping the firm-level demand for green skills. This generates important implications for corporate labor policies as climate regulations are becoming more prevalent globally.

This paper also has important policy implications. We document that higher environmental taxes, particularly in firms with more public attention and with greater financial resources, effectively stimulates the demand for green-skilled labor. The first implication for policymakers is that the level of environmental taxes is a crucial factor driving the effectiveness of environmental tax regulations. Second, regulators should exploit public scrutiny to enhance the effectiveness of environmental tax laws. Third, governments may need to consider provide financial support for firms to facilitate firms' green transition under certain legislative regimes. Overall, environmental policies should be designed not only penalize pollution but also to

actively encourage corporate investment in green human capital, fostering a workforce skilled in sustainable practices and technologies. This approach could be a crucial lever in transitioning industries towards more environmentally friendly practices, aligning economic growth with environmental sustainability.

2 Background and Hypothesis

2.1 Institutional Background

The "Environmental Protection Tax Law of the People's Republic of China," implemented on January 1, 2018, marks a significant step in China's environmental policy. This new law is the first tax legislation in China specifically aimed at environmental protection.[5] Its primary objective is to encourage the conservation of the environment, mitigate pollution, and foster sustainable development through the mechanism of taxation. This legislation effectively combines environmental protection with the fiscal framework, employing taxation as a strategic tool to economically regulate and restrict activities that are detrimental to the environment. The new law is intended to encourage corporations to enhance their commitment to environmental stewardship, reduce pollution emissions, and improve environmental quality.

The 2018 environmental protection tax law in China clarifies the intricacies of the tax, including taxpayers, taxable subjects, the basis for calculating the tax, tax rates, and tax incentives. Taxpayers under this law include enterprises, institutions, and other producers and operators who directly discharge taxable pollutants into the environment. The taxable activities include atmospheric pollutants, water pollutants, solid wastes, and noise, among others. Taxation is mainly based on the quantity of taxable pollutants discharged. In addition, tax rates are determined based on the type and volume of pollutants, allowing for differential tax rates

[5] In 1979, China established the pollutant discharge fee system, which imposes a fee for discharges of pollutants that exceed the permitted limits. However, the fee-based system faced significant challenges, insufficient enforcement rigidity, excessive administrative intervention, a lack of mandatory measures, and relatively low fee levels. As a result, the original system failed to adequately deter polluters or address environmental damages. Unlike the fee system, the 2018 tax law ensures greater transparency and consistency in its implementation.

according to the levels of pollution. According to this law, the administrative authority of ecological environment is responsible for the monitoring and management of pollutants.[6]

Figure 1 presents the annual environmental protection tax revenue in China, which is obtained from the China Taxation Yearbook. This graph breaks down the total tax revenue into several categories: air pollutants, water pollutants, solid waste, noise, and late payment (overdue) penalties. In 2018, environmental protection tax revenue totaled 15.14 billion RMB, and in 2019, it grew by 46.1% to 22.12 billion RMB. Despite a slight decline in 2020 and 2021, total tax revenue remained above 20 billion RMB.[7] Among different categories of taxes, air pollution taxes consistently account for the largest share of tax revenue at approximately 90%. Taxes on water pollution are the second largest category, accounting for approximately 7% of the total. In addition, overdue penalties, although small in relative terms, have increased continuously from 2018 to 2021 which could reflect stricter enforcement against non-compliance.

[Insert Figure 1 Here]

2.2 Hypothesis Development

We build upon the premise that tax-based environmental regulations, like China's Environmental Protection Tax Law, exert a comprehensive and multifaceted impact on corporate behavior. The introduction of an environmental tax creates a direct financial incentive for companies, especially those with high levels of pollution, to reduce their taxable emissions. This reduction can be achieved through various means, including the adoption of cleaner, more sustainable technologies. However, the successful implementation and ongoing management of green technologies and practices requires specific skills and knowledge. As companies transition to more environmentally friendly practices, they usually encounter a gap in their existing workforce's capabilities. This gap indicates a pronounced demand for talent with green skills.

[6] Table IA.1 in the Internet Appendix provides more details about the Environmental Protection Tax Law.
[7] According the latest statistics from the Ministry of Finance of the People's Republic of China, the total environmental protection tax revenue reached 21.1 billion RMB in 2022, representing a 3.9% annual growth rate.

Firms respond to environmental regulations not only through technological adaptations but also through strategic human resource decisions. In the presence of environmental regulations, employees skilled in areas such as renewable energy technology, sustainable waste management, or environmental compliance become a strategic resource, essential for a company's ability to innovate, maintain competitive advantage, and adhere to regulatory requirements. This framework suggests a strong positive relation between the implementation of environmental taxes and corporate demand for green talent. We formally state this hypothesis as follows:

H1: *The implementation of environmental taxation regulations increases the demand for employees with green skills in high-pollution firms.*

However, it is also possible that environmental taxes could reduce corporate green hiring rates. First, some firms may consider the costs of creating and maintaining green jobs to be higher than the benefits under new environmental taxation schemes. This could stem from increased costs linked to a scarce supply of skilled green workers and greater aggregate demand for these workers following environmental taxes. Therefore, if the cost of hiring green workers significantly exceeds the cost of paying environmental taxes, companies may choose to limit green hiring rates. Second, the introduction of environmental protection taxes may motivate companies to outsource their polluting production to firms facing less stringent environmental regulations. This may be more cost-effective than paying higher environmental taxes. This shift could reduce the demand for green-skilled labor in regions with higher environmental taxes.

In addition to the presence of environmental tax policies, we consider the stringency of these regulations. The stringency of an environmental tax law can be characterized by factors such as the tax rate, the breadth of emissions covered, and the penalties for non-compliance. Intuitively, a more stringent environmental tax regime should provide stronger economic incentives for firms to reduce pollution and invest in green technologies and practices. Consequently, we expect that the change in their demand for green-skilled labor is more pronounced when the environmental tax regime is more stringent. Our second hypothesis is as follows:

H2: *The effects of environmental taxation regulations on corporate green hiring are more pronounced if the tax regime is more stringent.*

3 Data and Variables

3.1 Data Sources

Our job posting data is from 51job.com, a leading online recruitment service provider in China. The 51job company was founded in 1998 and its website was officially launched in 1999. In 2002, the company started making money. It went public on the Nasdaq in 2004, becoming the first listed Chinese online recruitment company. Since 2015, the company has successively acquired a series of online recruitment service companies such as Yingjiesheng (a recruitment website particularly for college students and current students) and Lagou (a recruitment website for talents in the Internet industry). In June 2021, the company announced a privatization plan which it completed in 2022. According to a report by iResearch, 51job held the largest market share among Chinese online recruitment platforms in 2021. This company's annual sales were RMB 4.42 billion, with a profit margin of 14.5%, which is well above the industry average.[8] The platform is particularly noted for its diverse range of hiring companies, encompassing firms of all sizes across various industries. As of 2023, it has successfully served over 200 million users, including both employers and job seekers.

[Insert Figure 2 Here]

Figure 2 illustrates a screenshot for a job posting on 51job.com. The job posting dataset contains detailed information about jobs, including the employer's name, the position, the number of openings, descriptions of the job's functions and responsibilities, the department to which the position belongs, the job location, salary and benefits, requirements for language skills, educational background, and working experience, as well as the posting date. Our sample consists of over 6 million job postings of Chinese A-share listed companies between 2015 and

[8] For more detailed information, please refer to https://www.iresearch.com.cn/Detail/report?id=3981&isfree=0.

2021.[9] We exclude financial firms from our sample. In addition, we obtain companies' financial and other related information from CSMAR and CNRDS.

3.2 Variable Definitions

3.2.1 Green Hiring

Our dataset of job postings has several key advantages that enable us to properly measure the demand for green skills among companies. First, job postings, which are released by employers to find suitable job candidates, typically reflect the company's actual labor needs. Second, each position is clearly described, including its responsibilities, skills, and experience. Analyzing these descriptions helps us capture a company's demand for green talents. Third, job postings provide quantitative indicators, such as academic qualifications, working years, salaries, and benefits. These indicators can be used to quantify to what extent a company is willing to attract green talent by increasing salaries and benefits and/or lowering qualification requirements. Fourth, job postings from different companies can be compared with each other to understand variations in the green transition across different firms.

We would like to note that it is challenging to measure corporate demand for employees with green skills due to several reasons. First, technologies for environmental protection involve a wide range of fields, such as wastewater treatment, air purification, and solid waste management. Depending on the technology, employees are required to possess different types of professional knowledge and skills. Therefore, when measuring a company's need for green-skills workers, it is necessary to comprehensively take into account the characteristics and requirements of different technologies. Second, the standards and technologies associated with environmental protection are constantly evolving, which means that companies may change their skill requirements from time to time. It is essential to consider changing trends in the required skills set when gauging a company's need for employees with green skills.

We identify job postings that require green skills by analyzing their job descriptions. Specifically, we count the number of keywords associated with green skills in each job posting. We obtain the list of green-skill-related keywords from the *Occupational Classification*

[9] We identify public firms and subsidiaries of public firms by employer names.

Dictionary of the People's Republic of China. The dictionary was first published by the Ministry of Human Resources and Social Security in 1999 and has been updated from time to time. It is an authoritative document that scientifically classifies occupations. It scientifically, objectively, and comprehensively reflects the current occupational composition in mainland China. The dictionary classifies occupations in detail based on the principle of similarity in job nature and supplemented by similarity in skill level, and provides a detailed description of each occupation, including occupation name, job content, and skill requirements.

In our analysis, we use the latest version of the occupational classification dictionary issued in 2022, which labels 133 occupations as green occupations. Using textual analysis, we extract the top 200 most common words related to environmental protection from descriptions of these green occupations. We consider a posting as a green job posting (i.e., postings that require environmentally friendly skills) if descriptions of the position's functions and responsibilities contain three or more unique green-skill-related keywords. Table IA.2 in the Internet Appendix provides an example of green job postings, which contain multiple green keywords such as "environmental protection", "waste gas", and "wastewater".

[Insert Figure 3 Here]

Figure 3 illustrates the annual average percentage of green job postings among all job postings. On average, firms have posted a growing number of positions requiring green skills over time. Over the period of 2015 to 2021, the percentage of green job postings has almost doubled. The evidence indicates that the economy is shifting towards more environmentally friendly practices, and there is a growing demand for employees with green skills. As shown in Table IA.3 in the Internet Appendix, the percentage of green job postings varies significantly across industries. For instance, the average percent of green job postings in the Waste Resource Recovery industry is 10.03%, while the percentage in the Railway Transport industry is only 0.29%.

3.2.2 Control Variables

Our control variables are a set of firm characteristics that are expected to influence firms' hiring decisions. Firm size (*Size*) is the logarithm of total assets of a firm; Tobin's q (*Q*) is calculated as the market value of assets divided by the book value of assets, where the market value of assets refers to the sum of market value of equity and book value of liabilities; financial leverage (*Leverage*) is book value of liabilities scaled by book value of total assets; return-on-assets (*ROA*) is net income divided by total assets; cash holdings (*Cash*) is cash and short-term investments scaled by total assets; research and development (*R&D*) is computed as research and development spending scaled by total assets; *log (Age)* is the logarithm of firm age, where firm age refers to the number of years since the firm's IPO.

3.3 Summary Statistics

Table 1 reports descriptive statistics for the main variables in our paper. On average, 3.03% of job postings are for job positions that require green skills. The standard deviation is large (6.31), indicating that there is a wide variation in this percentage across different firms. 24.3% of the firm-year observations are associated with employers operating in the highly polluting industry. Moreover, approximately 65% of the observations fall in the period after the implementation of environmental protection tax law in 2018. The average firm in our sample is about 11 years old and holds approximately 18% of its total assets as cash and short-term investments. These firms are moderately profitable: for every dollar of assets owned, these firms generate an average of 3.3 cents in profit.

[Insert Table 1 Here]

4 Empirical Results

4.1 Baseline Results

We employ a difference-in-differences framework to analyze the effects of the environmental protection tax law on corporate recruitment strategies. The environmental taxes are charged based on the number of pollutants emitted by the company. Therefore, the tax burden on highly polluting firms is significantly higher than that on non-polluting firms. In our

analysis, highly polluting firms are regarded as the treatment group, and the remaining firms are considered as the control group. We identify highly polluting firms based on the Industry Classification Directory for Environmental Inspection and Management of Listed Companies issued by the Ministry of Environmental Protection and Guidance for Industry Classification of Listed Companies released by China Securities Regulatory Commission (CSRC). There are sixteen industries classified as highly polluting, including coal, mining, textiles, tanning, and paper manufacturing.[10] We estimate the following model in our baseline analysis:

$$\%Green\ Jobs_{i,t} = \alpha_0 + \beta_1 Polluter_i \times Taxation_t + \boldsymbol{X_{i,t-1}}\gamma + \delta_t + \delta_i + \epsilon_{i,t} \quad (1)$$

where $\%Green\ Jobs_{i,t}$ is the percentage of green job postings among all postings released by firm i in year t. $Polluter_i$ is a dummy variable that takes one if firm i belongs to a highly polluting industry, and zero otherwise. $Taxation_t$ is a dummy variable that takes one in years after the implementation of environmental protection tax law, and zero otherwise. $\boldsymbol{X_{i,t-1}}$ is a set of control variables, including firm size (*Size*), Tobin's q (*Q*), financial leverage (*Leverage*), return-on-assets (*ROA*), cash holdings (*Cash*), research and development (*R&D*), and the logarithm of firm age (log (*Age*)). δ_t and δ_i represent the year and firm fixed effects, respectively. Standard errors are clustered at the firm level. The coefficient of interest is the one on the interaction term, β_1, which captures how the environmental protection tax law affects the recruitment strategies of highly polluting firms relative to those of other firms. We would like to note that $Polluter_i$ and $Taxation_t$ do not appear as separate terms in the model because they will be absorbed by firm and year fixed effects.

Table 2 reports the estimation results from Equation (1). Column (1) incorporates year and industry fixed effects, where industries are classified based on the Guidance for Industry Classification of Listed Companies released by CSRC. The estimated coefficient on the interaction term, *Polluter*×*Taxation*, is positive (0.746) and statistically significant at the 1% significance level (t = 3.23), indicating that firms in highly polluting industries have notably increased the proportion of green hires compared to other firms following the implementation of the environmental tax law. In Column (2), we include a range of firm characteristics as

[10] The sixteen industries are labeled in Table IA.3 in the Internet Appendix.

control variables. This specification ensures that the estimated effects of environmental taxation on green hiring do not represent the effects of other factors that influence corporate demand for employees with green skills. The inclusion of these variables does not materially alter the estimated effects of the environmental tax law. Both the magnitude and statistical significance of the coefficient estimate on *Polluter*×*Taxation* is comparable to those obtained in the specification without firm-level controls.

[Insert Table 2 Here]

In Column (3), we take into account the effects of firm-specific time-invariant factors that might affect corporate hiring decisions, such as a firm's location and mission. The estimated coefficient on *Polluter*×*Taxation* is 0.672, with a *t*-stat of 2.90. That is, environmental taxation led to an increase in green job postings by 0.672 percentage points among highly polluting firms compared to firms in the control group. This effect is economically significant: the increase in the portion of green job postings corresponds to 22.19% of the average percentage of green job postings in our sample. Overall, results in Table 2 consistently show that the adoption of the environmental protection tax law motivates polluting firms to hire more employees with green skills.

4.2 Dynamic Effects of the Environmental Tax Law

One potential critique of our identification strategy is that the adoption of the environmental protection law is not a random event but rather correlates with omitted factors that are related to corporate recruitment strategies. To mitigate this concern, we examine the pre-trends by estimating the dynamic effects of adopting the environmental tax law. This analysis replaces the single law adoption dummy in our baseline specification with multiple indicator variables for each year in our sample period. Specifically, we estimate the following regression:

$$\%Green\ Jobs_{i,t} = \alpha_0 + \sum_{\substack{k=2015 \\ k\neq 2017}}^{k=2021} \beta_k Polluter_i \times \mathbb{I}\{t = k\} + \boldsymbol{X_{i,t-1}\gamma} + \delta_t + \delta_j + \epsilon_{i,t}, \quad (2)$$

where $\%Green\ Jobs_{i,t}$ is the percentage of green job postings among all postings released by firm i in a year t. $Polluter_i$ is a dummy variable that takes one if firm i belongs to a highly polluting industry, and zero otherwise. $\mathbb{I}\{t = k\}$ is a series of dummies that indicate year k from 2015 to 2021, with the year 2017 being omitted as the baseline year. $\boldsymbol{X_{i,t-1}}$ is a set of control variables measured in the previous year, including firm size (*Size*), Tobin's q (*Q*), financial leverage (*Leverage*), return-on-assets (*ROA*), cash holdings (*Cash*), research and development (*R&D*), and the logarithm of firm age (log (*Age*)). δ_t and δ_j represent the year and industry fixed effects, respectively. Standard errors are clustered at the firm level. β_k's are the coefficients of our interest.

[Insert Figure 4 Here]

If the timing of adopting environmental taxes is endogenous to the hiring decisions of employees with green skills, one would expect that the indicators for pre-event years to be statistically significant. However, as shown in Figure 4, the coefficients on pre-event year dummies are not statistically different from zero. This indicates that there is almost no difference in green hiring rates between the treated and control groups across years before China implemented the environmental protection tax law in 2018. The increase in the percentage of green job postings only occurs only after the implementation of the environmental tax law. The results validate the parallel trend assumption. Furthermore, Figure 4 illustrates that the effect of environmental taxes on green hiring is long-lasting, as evidenced by the significantly positive coefficient on the indicators several years after the legislation.

According to Figure 4, although the tax law was passed in 2016, companies had not adjusted their labor policies until its implementation in 2018. Several factors could explain the delay in corporate reaction. First, local governments did not provide sufficient guidance for the implementation of the tax law in 2016 and 2017. In certain provinces, the tax rates were not announced until late 2017. Second, it takes time for companies to integrate changes into their operations. As the environmental protection tax law is a new policy, the time delay can be lengthy.

4.3 Placebo Tests

As another attempt to validate the empirical design, we conduct placebo tests. If our baseline results reflect a truly positive effect of environmental taxes on corporate recruitment activities, we should observe no significant effects using artificially assigned treatment status among firms. Therefore, in the placebo tests, we randomly assign a company as a highly polluting firm while maintaining the initial distribution of polluters. We construct 1,000 random samples and re-estimate the baseline regression. The coefficient of interest is the coefficient on the interaction between the indictors for highly polluting firms and the tax law's implementation.

[Insert Figure 5 Here]

Figure 5 illustrates the histogram of coefficient estimates on *Polluter*×*Taxation* obtained from the 1,000 random samples. It shows that the distribution of these pseudo coefficient estimates is centered around zero. The mean of these coefficients is very close to zero and is statistically insignificant: the coefficient estimates have a mean of 0.002 with a standard error of 0.202. On the other hand, the true estimate, represented by the red dashed line, is far away from zero. The evidence suggests that our previous findings are unlikely to be driven by chance.

4.4 Robustness Checks

In this subsection, we conduct several robustness tests. First, time-varying location-specific factors may affect a firm's inclination to hire employees with green skills. For instance, local economic fluctuations in a particular year might influence hiring trends across all firms in a given area. At the same time, one may argue that these fluctuations could influence how well local governments enforce the environmental protection tax law and other environmental policies. This argument indicates that the omission of time-varying location-specific factors can potentially bias our baseline estimates. To mitigate this concern, we add province by year fixed effects to our estimation. This specification controls for unobserved heterogeneity that may arise from factors unique to each province in each year, such as regional policy differences, local economic climates, or location-specific environmental challenges.

The first column of Table 3 shows that the effect estimated from this alternative

specification is stronger than our baseline findings. The estimated coefficient on the interaction term, *Polluter*×*Taxation*, is 0.735, which means that compared to firms in the control group, implementing the environmental protection tax law increased green job postings by 0.735 percentage points among highly polluting firms. This increase in corporate demand for employees with green skills is statistically significant at the 1% significance level (t = 3.16).

[Insert Table 3 Here]

Second, we consider the effects of listed companies with special treatment (ST). ST stocks in Chinese A-share market refer to companies that are facing financial difficulties or other issues that put them at risk of not meeting the listing requirements of the stock exchange.[11] These companies are likely to have different priorities and financial capabilities compared to more stable firms, potentially affecting their hiring strategies, especially for specialized roles like green jobs. We test whether our conclusion is driven by outliers or companies under abnormal financial conditions by excluding the ST stocks. Column (2) in Table 3 presents results from this alternative sample. We find that the effects of environmental taxes on corporate green hiring rates remain positive and significant after the ST stocks are excluded from our sample.

Finally, we examine whether our conclusion is robust to the construction of our green hiring measure. In particular, we expand the list of green keywords from 200 to 500. Column (3) in Table 3 shows that the coefficient on *Polluter*×*Taxation* is estimated to be significantly positive. Despite the statistical significance level being lower, possibly due to the inclusion of more uncommon keywords creating more noise, the coefficient estimate is higher than our baseline estimate.

4.5 Variations in Environmental Tax Rates

[11] These situations include 1) audited net profits during the last two years are negative; 2) the firm has made loss for two consecutive years or its net asset per share is lower than the par value of the stock; 3) one certified public accountant issues a disclaimer or negative opinion on the financial report for the most recent fiscal year; 4) the audited shareholders' equity in the most recent fiscal year, excluding the portion not recognized by certified public accountants and relevant departments, is less than the registered capital; 5) the most recent audited financial report adjusted profits from the previous year, and this adjustment results in losses for two consecutive fiscal years; 6) the stock exchange or the CSRC considers the firm to be in an abnormal financial condition.

China's national environmental protection tax law introduces a framework for environmental taxation while allowing provincial governments the autonomy to determine their province's specific tax rates. This structure leads to notable variations in environmental tax rates across different provinces. To illustrate this, Figure IA.1 in the Internet Appendix presents the average environmental tax rates for each provincial administrative region in mainland China. The figure clearly highlights the substantial variation in these tax rates, underscoring the diversity of environmental taxation across the country. With the regional variation, we are able to examine the effects of environmental taxes on corporate recruitment strategies under different tax regimes.

[Insert Table 4 Here]

We split our sample by regions with varying environmental tax rates. In Table 4, estimation results for Equation (1) are reported separately for firms located in provinces with below-median and above-median environmental protection tax rates. Notably, in regions with high environmental tax rates, the interaction term, *Polluter*×*Taxation*, shows a significantly positive impact of environmental taxes on the percentage of green job postings among high polluters, with a coefficient of 0.971 (t = 3.38). This suggests that higher environmental taxes are effective in encouraging high-polluting firms to provide green jobs. In contrast, the interaction term is not statistically significant in firms located in regions with low tax rates, indicating a lesser or negligible influence of environmental taxes on corporate green hiring in these areas.

Overall, our analysis suggests that environmental taxation is a useful policy tool in promoting green employment, particularly when the environmental tax rates are sufficiently high. The results demonstrate how varying levels of environmental tax rates can significantly influence corporate behavior towards adopting more sustainable business models. The evidence highlights the importance of setting appropriate tax levels to motivate corporate transition towards environmental sustainability. These findings are particularly relevant for policymakers, as they offer a clear indication that the success of environmental taxation in driving green employment largely depends on the tax law's stringency.

4.6 Driving Factors for Corporate Green Transition

4.6.1 Public Attention

In this subsection, we conduct cross-sectional tests to better understand the motivators behind corporate green transition, particularly in the context of firms' recruitment strategies following the environmental protection tax law. As companies increasingly align their operations with sustainable practices, it's crucial to identify what drives their shift towards a greener workforce. One potential motivator for this shift is public attention. We expect that when firms face regulatory pressure, societal pressures from extensive public attention can facilitate their transition towards more sustainable practices.

In order to test our conjecture, we consider two measures for public attention. One is the Baidu Search Volume Index (SVI) for firms' stock codes, and the other one is media coverage, which is measured by the number of newspaper articles mentioning a firm in any given year. Firms are categorized into two groups based on whether they fall above or below the median in these metrics. The dependent variable is the percentage of green job postings (*%Green Jobs*) among all job postings by a firm in each year. The regression model is specified in Equation (1).

[Insert Table 5 Here]

Table 5 reports the estimation results. We find that environmental taxes and public attention work together to influence corporate demand for employees with green skills. Specifically, highly polluting firms with higher levels of public attention, as measured by Baidu Search Volume Index (SVI) or media coverage, show a more pronounced increase in green job postings following the implementation of environmental taxes. Among firms that receive low levels of public attention, the interaction term between *Polluter* and *Taxation* is not statistically different from zero. This trend suggests that societal scrutiny, alongside regulatory pressures, plays a crucial role in motivating firms, especially in highly polluting industries, to hire green talent. These findings highlight the importance of both public and regulatory influences in driving the corporate shift towards sustainable business practices, demonstrating that societal

engagement and awareness can amplify the effects of environmental policies. Understanding these dynamics is key to developing more effective policies and strategies that encourage firms, especially highly polluting ones, to prioritize environmental sustainability.

4.6.2 Financial Constraints

In this subsection, we consider the role of financial constraints in shaping the relation between environmental taxes and corporate green hiring decisions. This analysis is essential because it sheds light on how these constraints influence a firm's ability to adapt to environmental taxes, especially in hiring green talent. This understanding is key for assessing the differential effectiveness of these policies across various firms. We expect that transitioning towards a greener workforce requires significant financial resources, primarily because it involves investing in new technologies and infrastructure, training employees in sustainable practices, and ensuring compliance with environmental regulations. In addition, research and development in green initiatives, along with effective marketing of a company's sustainable efforts, demands substantial investment. These financial commitments are essential to facilitate the comprehensive shift in corporate human capital towards environmental sustainability objectives.

We test this conjecture by classifying companies into financially constrained and unconstrained firms based on their SA index, a financial constraint index proposed by Hadlock and Pierce (2010). A financially constrained (unconstrained) firm is defined as one whose SA index is above (below) the sample median in a given year. As shown in Column (1) of Table 6, we observe a significantly positive coefficient for the *Polluter*×*Taxation* interaction in firms with lower financial constraints. The evidence suggests that such firms are more able to respond to environmental tax policies by increasing their green job postings. In contrast, firms with higher financial constraints show a much smaller and statistically insignificant response (Column (2)), indicating that financial limitations may impede their ability to invest in green talent despite regulatory incentives.

[Insert Table 6 Here]

The differential responses across the two groups emphasize the role of financial health in a firm's green transition. This finding is crucial for policymakers and business leaders in designing and implementing environmental policies and corporate strategies that consider the financial capability of firms. Firms with more financial resources may adapt to regulatory shocks more easily, while those under greater financial pressures may struggle, highlighting the need for tailored policy designs and support mechanisms.

4.6.3 Tax Avoidance Experience

Tax avoidance and evasion has been an important corporate strategy for Chinese firms (e.g., Cai and Liu, 2009; Clayton et al., 2023). Firms vary in their incentives and ability to evade taxes. While environmental taxes are generally new and modest, firms skilled in tax avoidance might lean towards evasion rather than enhancing green hiring. Therefore, we expect that firms with extensive tax avoidance experience show a muted response to environmental taxes in terms of green hiring. We test this conjecture by splitting the sample into two subsamples based on the median level of tax avoidance in a given year. Following Tang, Mo, and Chan (2017), tax avoidance is measured as firms' effective tax rate, with a lower effective tax rate indicating higher tax avoidance. The effective tax rate is calculated as total income tax divided by earnings before tax.

[Insert Table 7 Here]

Table 7 reports the regression results among firms with different levels of tax avoidance. We find that the positive effects of environmental tax on corporate green hiring are more pronounced among firms with low tax avoidance experience (0.711, *t*-stat=2.06) than those with high tax avoidance experience (0.566, *t*-stat=1.66). The results indicate that firms adept at tax avoidence strategies are more likely to evade green taxes, leading to a smaller level of green transition.

4.7 Heterogeneity in Pre-tax-law Green Hiring

We now turn to the heterogeneity in firms' green hiring rates prior to the environmental

tax law implementation. This analysis is crucial because it sheds light on whether environmental taxes are effective in narrowing disparities in sustainable business practices among firms. Specifically, it examines if the tax law encouraged firms that were previously less engaged in green hiring to catch up with their counterparts that were more active in this area. This provides insights into whether these taxes merely reinforce existing green initiatives or actually drive a broader shift towards sustainability across various types of firms.

To answer this question, we classify firms into two groups based on their average percentage of green job postings before the environmental protection tax law was introduced. Employers with low green hiring rates before implementation are companies whose average proportion of green job postings is below the median value among firms in a given industry. Similarly, employers with high green hiring rates are companies whose average proportion of green job postings is above the median value among firms in a given industry. We run the regression specified in Equation (1) separately for the two groups of firms.

[Insert Table 8 Here]

Table 8 reports our estimation results. Column (1) shows that among firms with low pre-tax-law green hiring rates, the estimated coefficient on the interaction between *Polluter* and *Taxation* is 1.052 (t = 4.03), indicating that environmental taxes have a pronounced effect on boosting the proportion of green job postings among these firms. The coefficient estimate on the interaction term among firms with high pre-tax-law green hiring rates is smaller in magnitude (0.502) and statistically insignificant (t = 1.46). The results imply that environmental taxes are effective in incentivizing firms that were initially less active in green hiring to increase their commitment to sustainability. In other words, environmental tax policies are helpful in fostering a more uniform shift towards sustainability across the corporate landscape.

4.8 Green Hiring and Future Firm Performance

In this subsection, we examine how the hiring of employees with green skills affects future firm performance. In particular, we focus on firm profitability and corporate green innovation.

4.8.1 Firm Profitability

We first consider how an increase in green hiring induced by the implementation of environmental taxes affects firm profitability. In this analysis, we re-estimate Equation (1) with the return on equity as the dependent variable. Table 9 reports the results. Column (1) shows that following the implementation of the environmental tax law, the profitability of firms in the treatment group increased significantly compared to those in the control group. We then divide our sample into two subsamples based on the difference between firms' average percentage of green jobs before and after the implementation of the environmental tax law (*Δ%Green Jobs*). Columns (2) and (3) include firms with *Δ%Green Jobs* above and below the sample median in a given year, respectively. We find that the profitability-enhancing effect of the environmental tax law is more pronounced among firms that have experienced substantial increases in green hiring rates following the law's implementation.

[Insert Table 9 Here]

4.8.2 Green Innovation

This subsection examines how environmental taxes influence corporate green innovation, emphasizing the role of firms' green hiring practices prompted by environmental protection tax laws. The motivation for this analysis stems from the need to understand whether such regulations merely enforce minimal compliance or inspire significant technological advancements in environmental practices. While environmental taxes are intended to reduce pollution and encourage sustainability, their true impact on fostering green innovation remains a key area of academic and policy debate. Central to this inquiry is the role of human capital. Prior research suggests that a firm's capacity to innovate in response to regulatory pressures is heavily influenced by its workforce. Specifically, hiring employees with green skills—those equipped to develop and implement environmentally friendly technologies—may be crucial for effectively leveraging regulatory incentives. A skilled workforce enhances a firm's research, development, and innovation capabilities, enabling a more proactive and impactful response to environmental regulations.

This leads to an important hypothesis: the effectiveness of environmental tax laws in spurring green innovation may depend on whether firms invest in human capital tailored to sustainability goals. In other words, the introduction of environmental taxes might only lead to substantial innovation if firms also prioritize green hiring. This perspective emphasizes a dual strategy where regulatory pressure is complemented by strategic workforce planning. Understanding this interaction can provide valuable insights into the mechanisms through which environmental regulations drive innovation and how firms can optimize their response to such policies.

To test this hypothesis, we analyze whether firms that significantly increase green hiring experience greater growth in green patent applications following the implementation of environmental protection tax laws. By exploring variations in green innovation outcomes based on firms' hiring practices, we aim to identify the conditions under which environmental taxes effectively drive technological advancements for sustainability. This approach sheds light on the importance of aligning regulatory compliance with strategic human capital investments to maximize the impact of environmental policies.

Table 10 presents our results from this analysis. The outcome variable is the logarithm of one plus the number of green patent applications filed by a firm in a given year. Column (1) shows that the overall impact of the environmental protection tax law on corporate green innovation is not statistically significant across the entire sample. The coefficient for the interaction term *Polluter* × *Taxation* is only 0.042 and statistically insignificant, suggesting that the tax law alone does not universally lead to an increase in green innovation. This finding implies that, on average, the introduction of environmental protection taxes may not be sufficient to stimulate green innovation across all firms.

[Insert Table 10 Here]

However, we find a striking difference when firms are segmented based on the extent of their green hiring practices. Column (2) focuses on firms with a high increase in the percentage of green jobs, defined as those above the sample median in a given year. For these firms, the coefficient for *Polluter* × *Taxation* is 0.083 and statistically significant, indicating a positive

effect of environmental taxes on green innovation. This suggests that firms that proactively invest in green talent are more capable of translating regulatory incentives into technological advancements. The hiring of green-skilled employees likely equips these firms with the expertise and technical resources needed to engage in innovative environmental practices, thereby highlighting the importance of human capital in realizing the benefits of environmental policies.

In contrast, firms with a low increase in green hiring, as shown in Column (3), do not exhibit a similar response. The coefficient for the interaction term is -0.006 and is not statistically different from zero. This result implies that firms that are less responsive in hiring green-skilled workers do not experience a significant boost in green patents. The lack of impact for these firms again emphasizes the crucial role of strategic workforce adjustments in mediating the relationship between environmental regulations and innovation. Without a commitment to hiring and developing green talent, the potential for environmental taxes to enhance technological advancements appears limited.

Overall, our findings highlight the conditional effectiveness of environmental tax policies in fostering green innovation. The results indicate that environmental regulations are most successful when paired with complementary labor practices, such as hiring employees with green expertise. Firms that align their workforce strategies with environmental goals are better positioned to harness regulatory incentives and drive sustainable innovation. This also implies that human capital investment is essential for achieving the objectives of environmental policies and that future regulatory frameworks should consider supporting firms' efforts to recruit and train green-skilled employees.

4.9 Corporate Environmental Expenditures

Listed companies in China disclose their expenditures and investments related to environmental issues in footnotes of their annual reports. These disclosures are systematically categorized into two distinct sections: construction-in-progress and management expenses. The former details capital investments in projects aimed at enhancing environmental efficiency, such as energy efficiency improvements, water saving initiatives, and recycling systems. These

projects reflect a strategic focus on long-term environmental sustainability. On the other hand, management expenses cover ongoing operational costs related to environmental management. This includes expenditures for sewage treatment, greening efforts, garbage disposal, and other related activities.

[Insert Figure 6 Here]

The detailed reporting on environmental expenditures not only demonstrates compliance with environmental standards but also signifies the companies' proactive approach towards fostering a more sustainable future. We manually collect the data on corporate annual environmental expenditures. Figure 6 plots the ratio of the sum of firms' environmental expenditures to the sum of their total assets each year. It shows that the ratio increased over time, suggesting that firms have placed a growing emphasis on environment-related expenditures and investments in recent years. The evidence is consistent with our finding that the share of green job postings has grown over time, supporting our view that corporate need for green talent is positively correlated with their environmental investments.

5 Conclusions

Our paper investigates how China's environmental protection tax law implemented in 2018 influenced corporate demand for employees with green skills. Specifically, we utilize a comprehensive dataset of online job postings and exploit a difference-in-differences framework to identify causal effects. We find that highly polluting firms, that are the primary targets of the environmental protection tax law, accounted for a higher share of advertised green jobs after 2018 compared to firms in the control group. This finding is robust to alternative model specifications, alternative samples, and alternative measures of green hiring. Our dynamic effects estimation validates the parallel-trend assumption, which is essential to establish causality. In addition, placebo tests show that our baseline findings are unlikely to be driven by chance.

The green-job-promoting effect of environmental taxes is more pronounced in provinces

with higher tax rates, and among firms that receive greater public attention or have more financial resources. The effect is mitigated among firms with extensive tax avoidance experience. Moreover, the increase in corporate demand for green talent is concentrated among firms with historically lower green hiring rates. These findings suggest that environmental taxes effectively drive a green transition of the corporate workforce, especially among previously less sustainable firms. In addition, our findings suggest that an increase in green hiring associated with environmental tax regulations is beneficial for firms. Companies that significantly increase their demand for green skills following the implementation of the environmental tax law generate a higher return on equity and have a higher rate of more green innovation.

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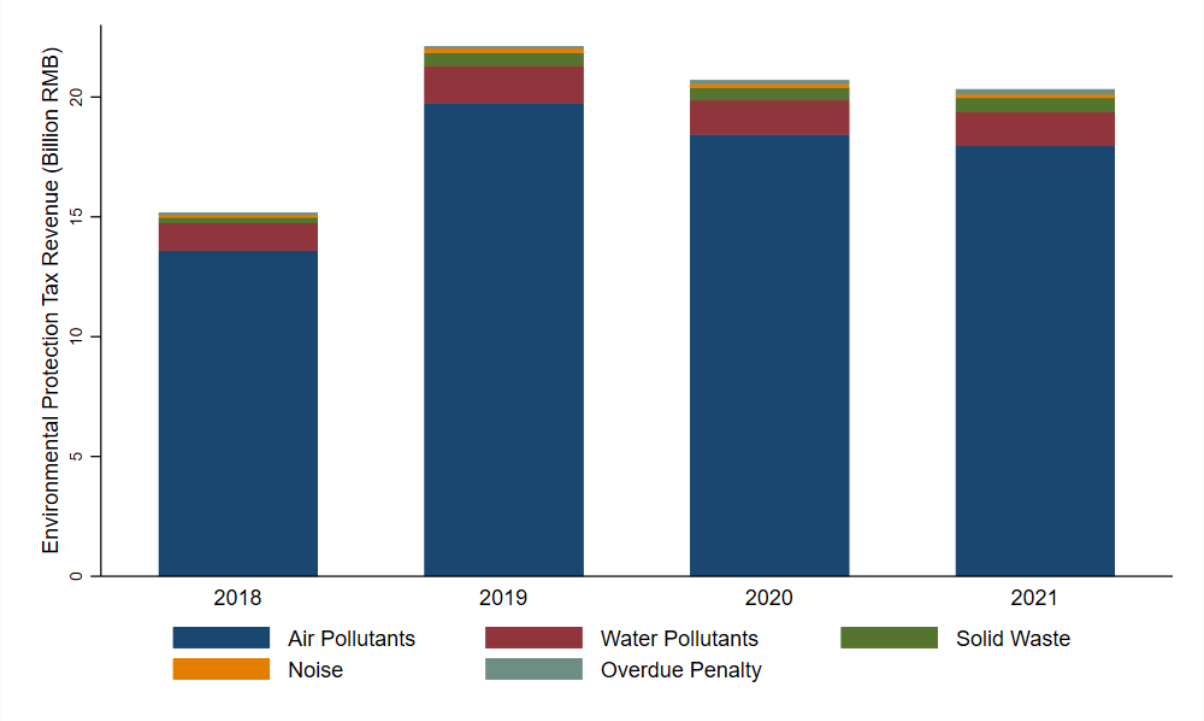


Figure 1 Annual Environmental Protection Tax Revenue by Type

This figure plots annual environmental protection tax revenue by pollutant type in China. Total tax revenue consists of tax revenue for air pollutants, water pollutants, solid waste, noise, and late payment/overdue penalties. The data is from China Taxation Yearbook.



Figure 2 Screenshot for a Job Posting on 51job.com

This figure is a screenshot for a job posting on 51job.com. It contains essential information about a job, including the position name, the employer's name, a description of the job's functions and responsibilities, job location, salary and benefits of the position, academic qualifications and work experience.

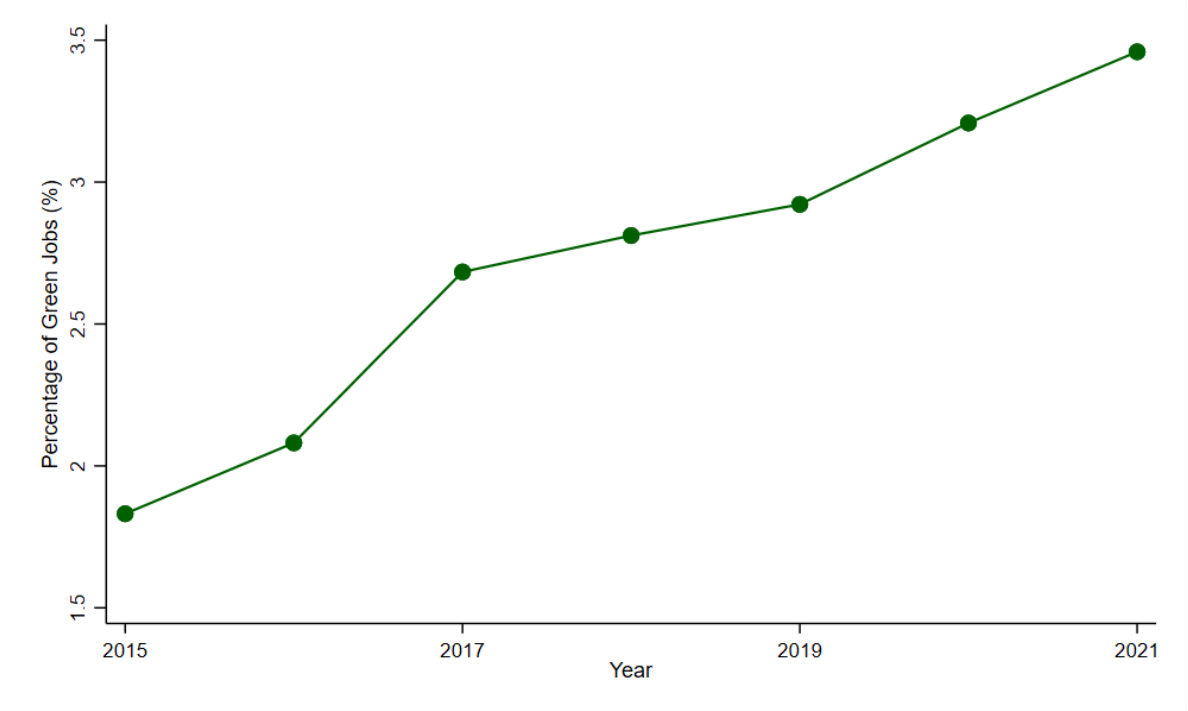


Figure 3 Percentage of Green Jobs over Time

This figure plots the average annual percentage of green job postings among all job postings. A job posting is classified as a green job posting (i.e., postings that require environmentally friendly skills) if descriptions of the position's functions and responsibilities contain three or more unique keywords from the top 200 most common green-skill-related keywords. The sample period is between 2015 and 2021.

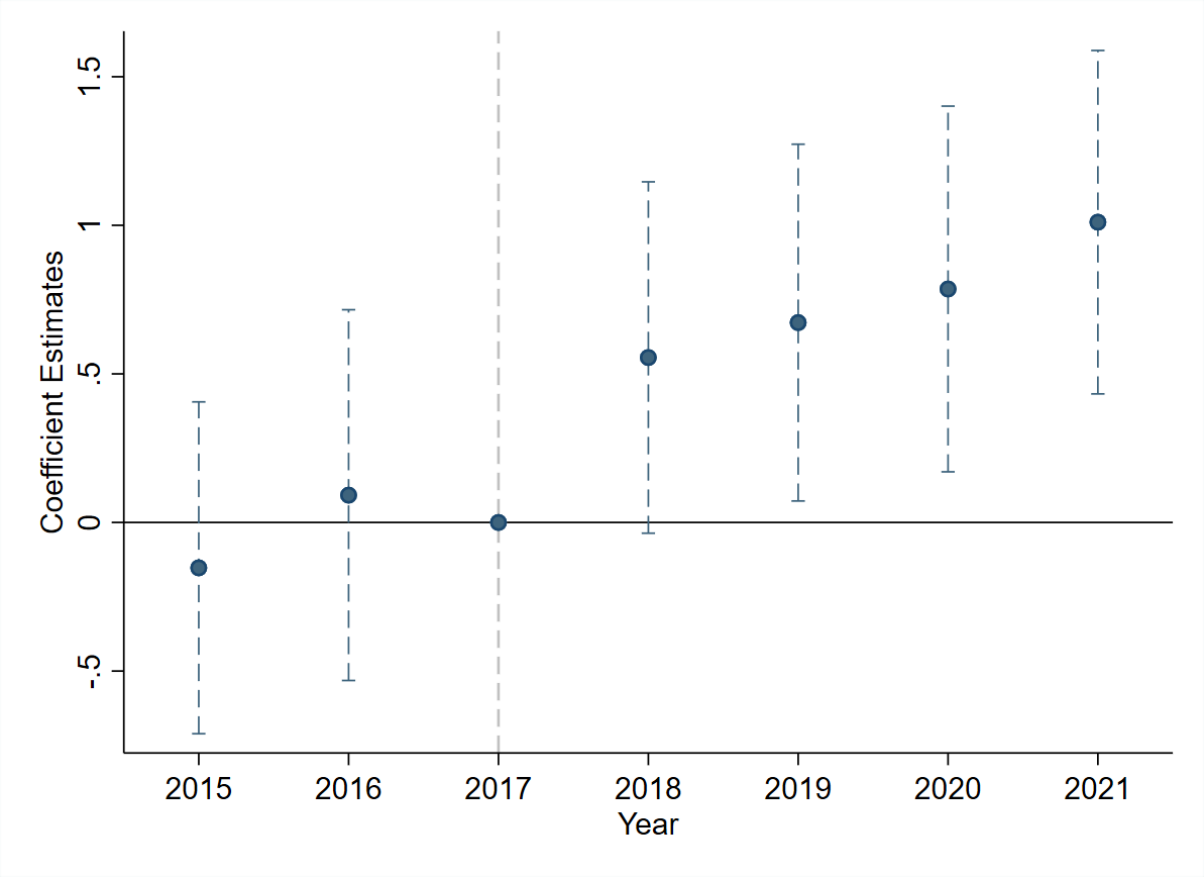


Figure 4 Dynamic Effects of Environmental Protection Tax on Green Hiring

This figure demonstrates the response in corporate demand for employees with green skills around the implementation date for the environmental protection tax law in mainland China. Specifically, it plots the $\hat{\beta}$s (dots) and the corresponding 90% confidence intervals (dashed lines) estimated from the following regression:

$$\%Green\ Jobs_{i,t} = \alpha_0 + \sum_{\substack{k=2015 \\ k\neq 2017}}^{k=2021} \beta_k Polluter_i \times \mathbb{I}\{t = k\} + \boldsymbol{X_{i,t-1}\gamma} + \delta_t + \delta_j + \epsilon_{i,t}$$

where $\%Green\ Jobs_{i,t}$ is the percentage of green job postings among all postings released by firm i in a year t. $Polluter_i$ is a dummy variable that takes one if firm i belongs to a highly polluting industry, and zero otherwise. $\mathbb{I}\{t = k\}$ is a series of dummies that indicate year k from 2015 to 2021, with the year 2017 being omitted as the baseline year. $\boldsymbol{X_{i,t-1}}$ is a set of control variables measured in the previous year, including firm size (*Size*), Tobin's q (*Q*), financial leverage (*Leverage*), return-on-assets (*ROA*), cash holdings (*Cash*), research and development (*R&D*), and the logarithm of firm age (log (*Age*)). δ_t and δ_j represent the year and industry fixed effects, respectively. The sample period is from 2015 to 2021.

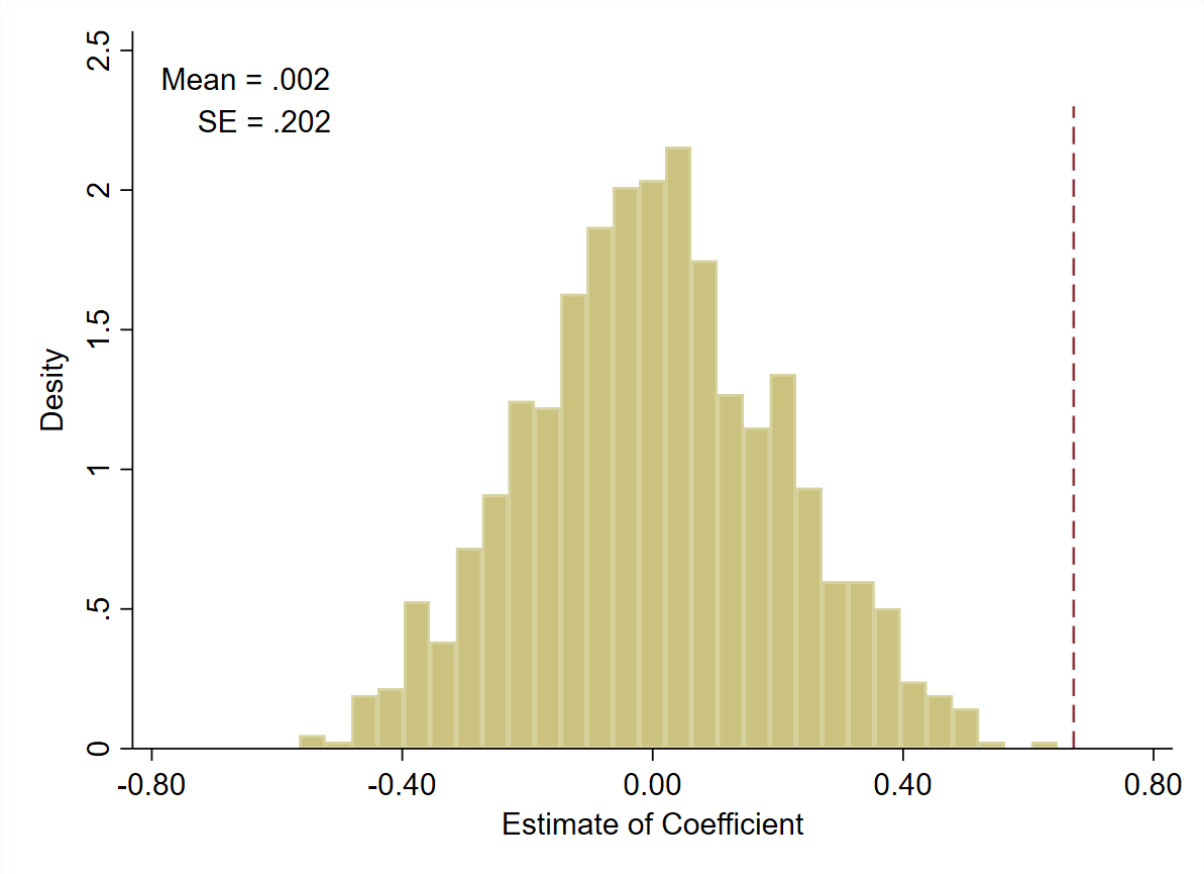


Figure 5 Distribution of Coefficient Estimates from the Placebo Test

This figure plots a histogram of the distribution of the estimated coefficient on the interaction between indicators for highly polluting firms and years following the adoption of the environmental protection tax law from 1,000 placebo tests. The regression specification is the same as in Equation (1). The x-axis represents the coefficient estimates from the placebo tests that randomly assign a highly polluting firm in the sample while maintaining the initial distribution of treatment firms. The Mean and SE is the average and the standard error of these fake estimated coefficients, respectively. The red dashed line represents the true coefficient estimate using the correct pollution levels of firms. The sample period is from 2015 to 2021.

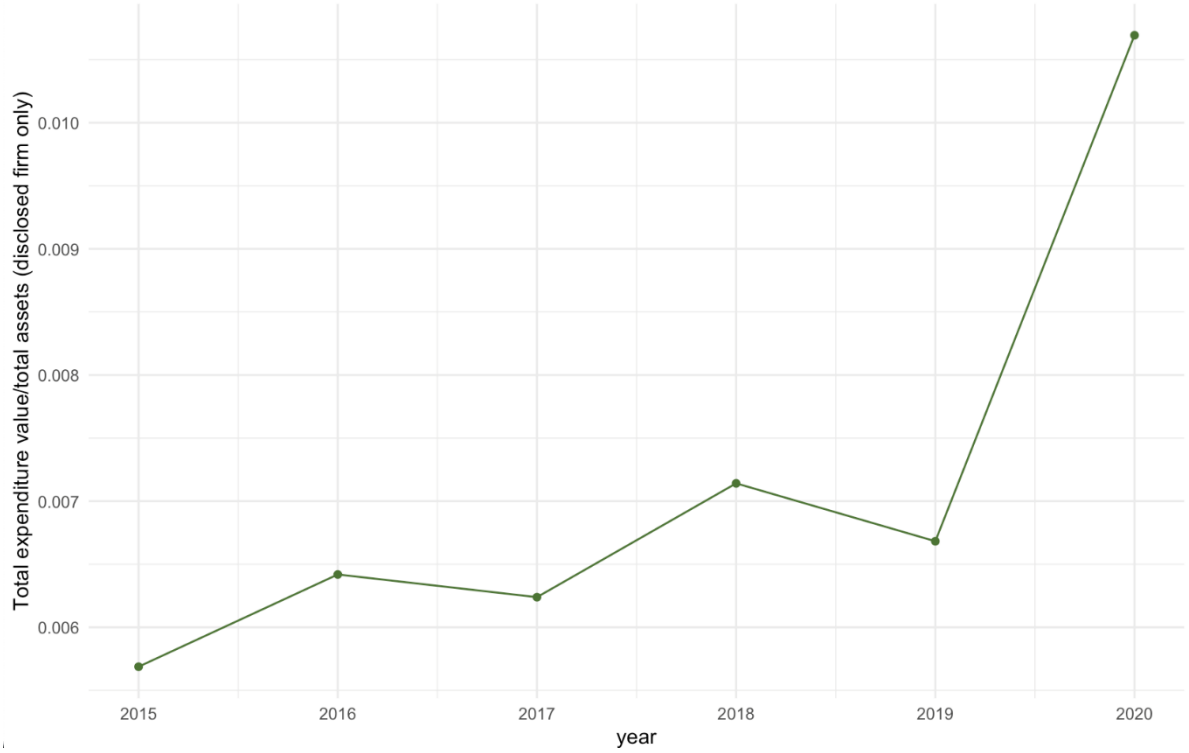


Figure 6 Environmental Expenditure among Chinese Listed Firms

This figure plots the ratio of firms' environmental expenditure to their total assets each year. Firms' environmental expenditure refers to expenditures and investments related to environmental issues, which are typically disclosed in the section of construction-in-progress and management expenses. The former details capital investment in projects aimed at enhancing environmental efficiency, such as energy efficiency improvements, water saving initiatives, and recycling systems. The latter covers ongoing operational costs related to environmental management, which includes expenditure on sewage treatment, greening efforts, garbage disposal, and other related activities. The data is manually collected from firms' financial reports. The calculation is based on data from 2015 to 2020 for firms that have available information.

Table 1 Summary Statistics

This table reports summary statistics for variables in this paper. *%Green Jobs* is the percentage of green job postings among all postings released by a firm in a given year. *Polluter* is a dummy variable that takes one if a firm belongs to a highly polluting industry, and zero otherwise. *Taxation* is a dummy variable that takes one in years after the implementation of environmental protection tax law, and zero otherwise. Other variables include firm size (*Size*), Tobin's q (*Q*), financial leverage (*Leverage*), return-on-assets (*ROA*), cash holdings (*Cash*), research and development (*R&D*), and firm age (*Age*). Table A.1 in the Appendix provides detailed variable definitions. The sample period is between 2015 and 2021. Continuous variables are winsorized at the 1 and 99 percentiles.

	Mean	SD	Q1	Median	Q3
%Green Jobs	3.029	6.312	0.000	0.842	3.333
Polluter	0.243	0.429	0.000	0.000	0.000
Taxation	0.649	0.477	0.000	1.000	1.000
Size	8.419	1.297	7.497	8.248	9.135
Q	2.153	1.486	1.277	1.683	2.431
Leverage	0.421	0.207	0.256	0.409	0.569
ROA	0.033	0.080	0.014	0.038	0.068
Cash	0.179	0.124	0.092	0.146	0.232
R&D	0.011	0.017	0.000	0.000	0.018
Age	11.031	7.747	4.000	9.000	18.000

Table 2 Environmental Protection Tax and Green Hiring: Baseline Results

This table reports the effects of the environmental protection tax law on firms' demand for employees with green skills. The dependent variable, *%Green Jobs*, is the percentage of green job postings among all postings of a firm in a given year. *Polluter* is a dummy variable that takes the value of one if a firm belongs to a highly polluting industry, and zero otherwise. *Taxation* is a dummy variable that takes the value of one in the years after the implementation of environmental protection tax law, and zero otherwise. Control variables include firm size (*Size*), Tobin's q (*Q*), financial leverage (*Leverage*), return-on-assets (*ROA*), cash holdings (*Cash*), research and development (*R&D*), and the logarithm of firm age (log (*Age*)). Table A.1 in the Appendix provides detailed variable definitions. Columns (1) and (2) include year and industry fixed effects. Column (3) includes year and firm fixed effects. The sample period is from 2015 to 2021. *t*-statistics based on standard errors clustered at the firm level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	%Green Jobs		
	(1)	(2)	(3)
Polluter × Taxation	0.746***	0.738***	0.672***
	(3.23)	(3.18)	(2.90)
Size		0.203***	0.180
		(3.09)	(1.29)
Q		0.018	-0.083**
		(0.46)	(-2.03)
Leverage		0.421	0.429
		(1.14)	(0.79)
ROA		1.008	1.141*
		(1.58)	(1.73)
Cash		-0.446	-0.318
		(-0.94)	(-0.57)
R&D		-8.765**	0.448
		(-2.51)	(0.12)
log (Age)		-0.099	0.423**
		(-1.32)	(2.35)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	No
Firm FE	No	No	Yes
Obs	19,314	19,314	19,314
Adjusted R^2	0.129	0.131	0.350

Table 3 Environmental Protection Tax and Green Hiring: Robustness

This table reports the effects of environmental taxes on corporate demand for green talent using alternative specifications, samples, and measures. Column (1) replaces the year fixed effects with the province by year fixed effects. Column (2) excludes listed companies with special treatment. Column (3) employs an alternative green hiring measure that is constructed based on green job postings identified by a list of 500 green keywords. The dependent variable, *%Green Jobs*, is the percentage of green job postings among all postings released by a firm in a given year. *Polluter* is a dummy variable that takes the value of one if a firm belongs to a highly polluting industry, and zero otherwise. *Taxation* is a dummy variable that takes the value of one in the years after the implementation of environmental protection tax law, and zero otherwise. Control variables include firm size (*Size*), Tobin's q (*Q*), financial leverage (*Leverage*), return-on-assets (*ROA*), cash holdings (*Cash*), research and development (*R&D*), and the logarithm of firm age (log (*Age*)). Table A.1 in the Appendix provides detailed variable definitions. Columns (2) and (3) includes year and firm fixed effects. The sample period is from 2015 to 2021. *t*-statistics based on standard errors clustered at the firm level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	%Green Jobs		
	Province-year FE	Exclude ST Stocks	Extended Green Keywords
	(1)	(2)	(3)
Polluter × Taxation	0.735***	0.531**	0.712**
	(3.16)	(2.21)	(2.17)
Size	0.175	0.272**	0.123
	(1.22)	(2.01)	(0.61)
Q	-0.094**	-0.048	-0.060
	(-2.24)	(-1.10)	(-1.14)
Leverage	0.422	0.119	0.417
	(0.77)	(0.20)	(0.55)
ROA	1.176*	0.749	1.818*
	(1.78)	(1.23)	(1.87)
Cash	-0.257	-0.866	-0.335
	(-0.46)	(-1.54)	(-0.45)
R&D	-0.804	-3.455	-2.343
	(-0.21)	(-0.97)	(-0.46)
log (Age)	0.410**	0.386**	0.452*
	(2.20)	(2.08)	(1.90)
Year FE	No	Yes	Yes
Firm FE	Yes	Yes	Yes
Province × Year FE	Yes	No	No
Obs	19,314	17,275	19,314
Adjusted R^2	0.350	0.367	0.400

Table 4 Regional Variations in Environmental Tax Rates

This table reports the effects of environmental taxes on corporate demand for green talent across regions with different environmental tax rates. The sample in Column (1) contains firms located in provinces with below-median environmental tax rates, while the sample in Column (2) contains firms located in provinces with above-median environmental tax rates. The dependent variable, *%Green Jobs*, is the percentage of green job postings among all postings released by a firm in a given year. *Polluter* is a dummy variable that takes the value of one if a firm belongs to a highly polluting industry, and zero otherwise. *Taxation* is a dummy variable that takes the value of one in years after the implementation of environmental protection tax law, and zero otherwise. Control variables include firm size (*Size*), Tobin's q (*Q*), financial leverage (*Leverage*), return-on-assets (*ROA*), cash holdings (*Cash*), research and development (*R&D*), and the logarithm of firm age (log (*Age*)). Table A.1 in the Appendix provides detailed variable definitions. The regressions include year and firm fixed effects. The sample period is from 2015 to 2021. *t*-statistics based on standard errors clustered at the firm level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	%Green Jobs	
	Low Tax Rate	High Tax Rate
	(1)	(2)
Polluter × Taxation	0.088	0.971***
	(0.23)	(3.38)
Size	0.313	0.125
	(1.12)	(0.78)
Q	-0.049	-0.090**
	(-0.58)	(-1.96)
Leverage	-0.166	0.719
	(-0.16)	(1.13)
ROA	0.539	1.457*
	(0.51)	(1.75)
Cash	-0.795	-0.048
	(-0.77)	(-0.07)
R&D	2.026	-0.342
	(0.24)	(-0.08)
log (Age)	0.342	0.460**
	(0.85)	(2.38)
Year FE	Yes	Yes
Firm FE	Yes	Yes
Obs	5,756	13,558
Adjusted R^2	0.313	0.365

Table 5 Effects of Public Attention

This table reports the effects of environmental taxes on corporate demand for green talent across firms with different levels of public attention. The sample in odd-numbered (even-numbered) columns contains firms whose level of public attention is below (above) the sample median in a given year. Columns (1) and (2) measures public attention with the Baidu Search Volume Index (SVI) for a firm's stock code. Columns (3) and (4) measures public attention with media coverage of the firm. Media coverage refers to the number of newspaper articles mentioning a firm in a given year. The dependent variable, *%Green Jobs*, is the percentage of green job postings among all postings released by a firm in a given year. *Polluter* is a dummy variable that takes the value of one if a firm belongs to a highly polluting industry, and zero otherwise. *Taxation* is a dummy variable that takes the value of one in years after the implementation of environmental protection tax law, and zero otherwise. Control variables include firm size (*Size*), Tobin's q (*Q*), financial leverage (*Leverage*), return-on-assets (*ROA*), cash holdings (*Cash*), research and development (*R&D*), and the logarithm of firm age (log (*Age*)). Table A.1 in the Appendix provides detailed variable definitions. The regressions include year and firm fixed effects. The sample period is from 2015 to 2021. *t*-statistics based on standard errors clustered at the firm level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	Baidu Search Volume Index		Media Coverage	
	Low	High	Low	High
	(1)	(2)	(3)	(4)
Polluter × Taxation	0.130	0.896***	0.526	0.637**
	(0.30)	(2.93)	(1.34)	(2.37)
Size	0.160	0.224	0.333	0.206
	(0.88)	(1.22)	(1.38)	(1.12)
Q	-0.017	-0.146**	-0.085	-0.082
	(-0.27)	(-2.28)	(-1.04)	(-1.60)
Leverage	-1.767*	1.355*	-0.135	1.352*
	(-1.96)	(1.75)	(-0.18)	(1.86)
ROA	1.050	1.239	1.203	2.411**
	(0.63)	(1.54)	(1.41)	(2.26)
Cash	0.099	-0.386	-0.877	-0.695
	(0.11)	(-0.48)	(-0.98)	(-0.95)
R&D	11.043*	-1.327	2.822	-2.257
	(1.65)	(-0.26)	(0.41)	(-0.52)
log (Age)	0.502*	0.120	-0.018	0.655**
	(1.70)	(0.33)	(-0.06)	(2.50)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Obs	8,793	10,521	8,827	10,487
Adjusted R^2	0.369	0.350	0.333	0.393

Table 6 Effects of Financial Constraints

This table reports the effects of environmental taxes on corporate demand for green talent across firms with different levels of financial constraints. The sample in Column (1) contains firms whose financial constraints are below the sample median in a given year, while the sample in Column (2) contains firms whose financial constraints are above the sample median in a given year. Financial constraints are measured by the SA index constructed following Hadlock and Pierce (2010). The dependent variable, *%Green Jobs*, is the percentage of green job postings among all postings released by a firm in a given year. *Polluter* is a dummy variable that takes the value of one if a firm belongs to a highly polluting industry, and zero otherwise. *Taxation* is a dummy variable that takes the value of one in years after the implementation of environmental protection tax law, and zero otherwise. Control variables include firm size (*Size*), Tobin's q (*Q*), financial leverage (*Leverage*), return-on-assets (*ROA*), cash holdings (*Cash*), research and development (*R&D*), and the logarithm of firm age (log (*Age*)). Table A.1 in the Appendix provides detailed variable definitions. The regressions include year and firm fixed effects. The sample period is from 2015 to 2021. *t*-statistics based on standard errors clustered at the firm level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	%Green Jobs	
	Low Financial Constraints	High Financial Constraints
	(1)	(2)
Polluter × Taxation	0.723**	0.391
	(2.26)	(0.98)
Size	0.002	0.278
	(0.01)	(1.63)
Q	-0.087	-0.072
	(-1.20)	(-1.37)
Leverage	1.092	-0.870
	(1.39)	(-1.06)
ROA	0.851	2.064*
	(0.94)	(1.85)
Cash	-0.207	-0.536
	(-0.22)	(-0.70)
R&D	3.275	1.510
	(0.52)	(0.26)
log (Age)	-0.953	0.252
	(-0.69)	(0.93)
Year FE	Yes	Yes
Firm FE	Yes	Yes
Obs	9,618	9,696
Adjusted R^2	0.298	0.418

Table 7 Experience of Tax Avoidance

This table reports the effects of environmental taxes on corporate demand for green talent across firms with different levels of tax avoidance experience. The sample in Column (1) contains firms whose level of tax avoidance is below the sample median in a given year, while the sample in Column (2) contains firms whose level of tax avoidance is above the sample median in a given year. Tax avoidance is measured by firms' effective tax rate, calculated as total income tax divided by earnings before tax. A lower effective tax rate indicates higher tax avoidance. The dependent variable, *%Green Jobs*, is the percentage of green job postings among all postings released by a firm in a given year. *Polluter* is a dummy variable that takes the value of one if a firm belongs to a highly polluting industry, and zero otherwise. *Taxation* is a dummy variable that takes the value of one in years after the implementation of environmental protection tax law, and zero otherwise. Control variables include firm size (*Size*), Tobin's q (*Q*), financial leverage (*Leverage*), return-on-assets (*ROA*), cash holdings (*Cash*), research and development (*R&D*), and the logarithm of firm age (log (*Age*)). Table A.1 in the Appendix provides detailed variable definitions. The regressions include year and firm fixed effects. The sample period is from 2015 to 2021. *t*-statistics based on standard errors clustered at the firm level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	%Green Jobs	
	Low Tax Avoidance	High Tax Avoidance
	(1)	(2)
Polluter × Taxation	0.711**	0.566*
	(2.06)	(1.66)
Size	0.293	0.101
	(1.34)	(0.49)
Q	-0.056	-0.038
	(-0.75)	(-0.73)
Leverage	-0.726	1.086
	(-0.74)	(1.47)
ROA	-3.309	1.668**
	(-1.45)	(2.04)
Cash	-0.610	-0.289
	(-0.65)	(-0.39)
R&D	4.343	-8.568
	(0.57)	(-1.57)
log (Age)	-0.191	0.695***
	(-0.57)	(2.82)
Year FE	Yes	Yes
Firm FE	Yes	Yes
Obs	9,664	9,642
Adjusted R^2	0.336	0.414

Table 8 Comparing Firms with Different Levels of Pre-tax-law Green Hiring

This table reports the effects of environmental taxes on corporate demand for green talent across firms with different green hiring rates prior to the adoption of the environmental protection tax law. The sample in Column (1) contains firms whose pre-tax-law green hiring rates are below the median in a given industry, while the sample in Column (2) contains firms whose pre-tax-law green hiring rates are above the median in a given industry. The dependent variable, *%Green Jobs* is the percentage of green job postings among all postings released by a firm in a given year. The pre-tax-law green hiring rate for a firm is the average of its *%Green Jobs* across years before the environmental protection tax law was implemented. *Polluter* is a dummy variable that takes the value of one if a firm belongs to a highly polluting industry, and zero otherwise. *Taxation* is a dummy variable that takes the value of one in years after the implementation of environmental protection tax law, and zero otherwise. Control variables include firm size (*Size*), Tobin's q (*Q*), financial leverage (*Leverage*), return-on-assets (*ROA*), cash holdings (*Cash*), research and development (*R&D*), and the logarithm of firm age (log (*Age*)). Table A.1 in the Appendix provides detailed variable definitions. The regressions include year and firm fixed effects. The sample period is from 2015 to 2021. *t*-statistics based on standard errors clustered at the firm level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	%Green Jobs	
	Low Pre-tax-law Green Hiring	High Pre-tax-law Green Hiring
	(1)	(2)
Polluter × Taxation	1.052***	0.502
	(4.03)	(1.46)
Size	0.183	0.300
	(1.35)	(1.31)
Q	0.097**	-0.191***
	(2.26)	(-2.77)
Leverage	0.112	0.553
	(0.20)	(0.61)
ROA	1.331**	0.855
	(2.34)	(0.71)
Cash	0.463	-1.258
	(0.81)	(-1.29)
R&D	-7.507	9.442*
	(-1.51)	(1.69)
log (Age)	0.165	0.344
	(0.79)	(1.11)
Year FE	Yes	Yes
Firm FE	Yes	Yes
Obs	8,602	9,745
Adjusted R^2	0.239	0.358

Table 9 Green Hiring and Firm Profitability

This table presents the effects of environmental taxes on future firm profitability among companies experiencing different changes in green hiring rates following the law adoption. The dependent variable is return on equity. *Δ%Green Jobs* of a firm is calculated as the difference between its average percentage of green jobs before and after the implementation of the environmental tax law. Column (1) includes all firms in the sample. Column (2) includes firms with *Δ%Green Jobs* above the sample median in a given year. Column (3) includes firms with *Δ%Green Jobs* below the sample median in a given year. *Polluter* is a dummy variable that takes one if a firm belongs to a highly polluting industry, and zero otherwise. *Taxation* is a dummy variable that takes one in years after the implementation of environmental protection tax law, and zero otherwise. Control variables include firm size (*Size*), Tobin's q (*Q*), financial leverage (*Leverage*), return-on-assets (*ROA*), cash holdings (*Cash*), research and development (*R&D*), and the logarithm of firm age (log (*Age*)). Table A.1 in the Appendix provides detailed variable definitions. The regressions include year and firm fixed effects. The sample period is from 2015 to 2021. *t*-statistics based on standard errors clustered at the firm level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	ROE		
	All	High Δ%Green Jobs	Low Δ%Green Jobs
	(1)	(2)	(3)
Polluter × Taxation	0.049***	0.058***	0.041***
	(6.12)	(4.72)	(3.94)
Size	-0.055***	-0.068***	-0.043***
	(-6.55)	(-5.36)	(-3.90)
Q	0.011***	0.008**	0.014***
	(4.71)	(2.17)	(5.04)
Leverage	0.168***	0.141***	0.193***
	(5.70)	(3.40)	(4.58)
ROA	0.109*	0.076	0.139*
	(1.93)	(0.91)	(1.90)
Cash	0.210***	0.238***	0.179***
	(8.65)	(6.51)	(5.67)
R&D	1.049***	1.316***	0.764***
	(5.73)	(5.24)	(2.90)
log (Age)	-0.029***	-0.033***	-0.025***
	(-4.07)	(-3.02)	(-2.83)
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Obs	18,880	9,441	9,439
Adjusted R^2	0.174	0.165	0.185

Table 10 Green Hiring and Green Innovation

This table presents the effects of environmental taxes on future corporate green innovation among companies experiencing different changes in green hiring rates following the law adoption. The dependent variable is the logarithm of one plus the number of green patent applications filed by a firm in a given year. *Δ%Green Jobs* of a firm is calculated as the difference between its average percentage of green jobs before and after the implementation of the environmental tax law. Column (1) includes all firms in the sample. Column (2) includes firms with *Δ%Green Jobs* above the sample median in a given year. Column (3) includes firms with *Δ%Green Jobs* below the sample median in a given year. *Polluter* is a dummy variable that takes the value of one if a firm belongs to a highly polluting industry, and zero otherwise. *Taxation* is a dummy variable that takes the value of one in years after the implementation of environmental protection tax law, and zero otherwise. Control variables include firm size (*Size*), Tobin's q (*Q*), financial leverage (*Leverage*), return-on-assets (*ROA*), cash holdings (*Cash*), research and development (*R&D*), and the logarithm of firm age (log (*Age*)). Table A.1 in the Appendix provides detailed variable definitions. The regressions include year and firm fixed effects. The sample period is from 2015 to 2021. *t*-statistics based on standard errors clustered at the firm level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	log(1+#Green Patent Application)		
	All	High Δ%Green Jobs	Low Δ%Green Jobs
	(1)	(2)	(3)
Polluter × Taxation	0.042	0.088**	-0.006
	(1.40)	(2.07)	(-0.14)
Size	0.327***	0.332***	0.312***
	(13.69)	(9.15)	(10.13)
Q	0.044***	0.045***	0.042***
	(7.00)	(5.30)	(4.46)
Leverage	-0.180***	-0.171*	-0.183*
	(-2.58)	(-1.75)	(-1.84)
ROA	0.352***	0.312***	0.398***
	(4.02)	(2.78)	(2.88)
Cash	-0.007	-0.005	-0.003
	(-0.10)	(-0.05)	(-0.03)
R&D	1.689***	1.280	2.057**
	(2.67)	(1.48)	(2.21)
log (Age)	-0.141***	-0.147***	-0.136***
	(-5.00)	(-3.78)	(-3.35)
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Obs	18,905	9,461	9,444
Adjusted R^2	0.765	0.744	0.779

Appendix

Table A.1 Variable Definitions

This table describes detailed variable definitions and corresponding data sources.

Variable	Definition
%Green Jobs	The percentage of green job postings among all postings released by a firm in a given year
Polluter	A dummy variable that takes the value of one if a firm belongs to a highly polluting industry, and zero otherwise
Taxation	A dummy variable that takes the value of one in years after the implementation of environmental protection tax law, and zero otherwise
Size	Firm size, calculated as the logarithm of total assets of a firm
Q	Tobin's q, calculated as the market value of assets divided by the book value of assets, where the market value of assets refers to the sum of market value of equity and book value of liabilities
Leverage	Financial leverage, calculated as book value of liabilities scaled by book value of total assets
ROA	Return-on-assets, calculated as net income divided by total assets
Cash	Cash holdings, calculated as cash and short-term investments scaled by total assets
R&D	Research and development, calculated as research and development spending scaled by total assets
log (Age)	The logarithm of firm age, where firm age refers to the number of years since the firm's IPO
Baidu Search Volume Index	The searching volume index for a company's stock code in a given year provided by Baidu
Media Coverage	The number of newspaper articles mentioning a firm in a given year
Financial Constraints	The SA index constructed following Hadlock and Pierce (2010)
ROE	Return-on-equity, calculated as net income divided by shareholder equity
log(1+#Green Patent Application)	The logarithm of one plus the number of green patent applications filed by a firm in a given year

Internet Appendix

Not for Publication

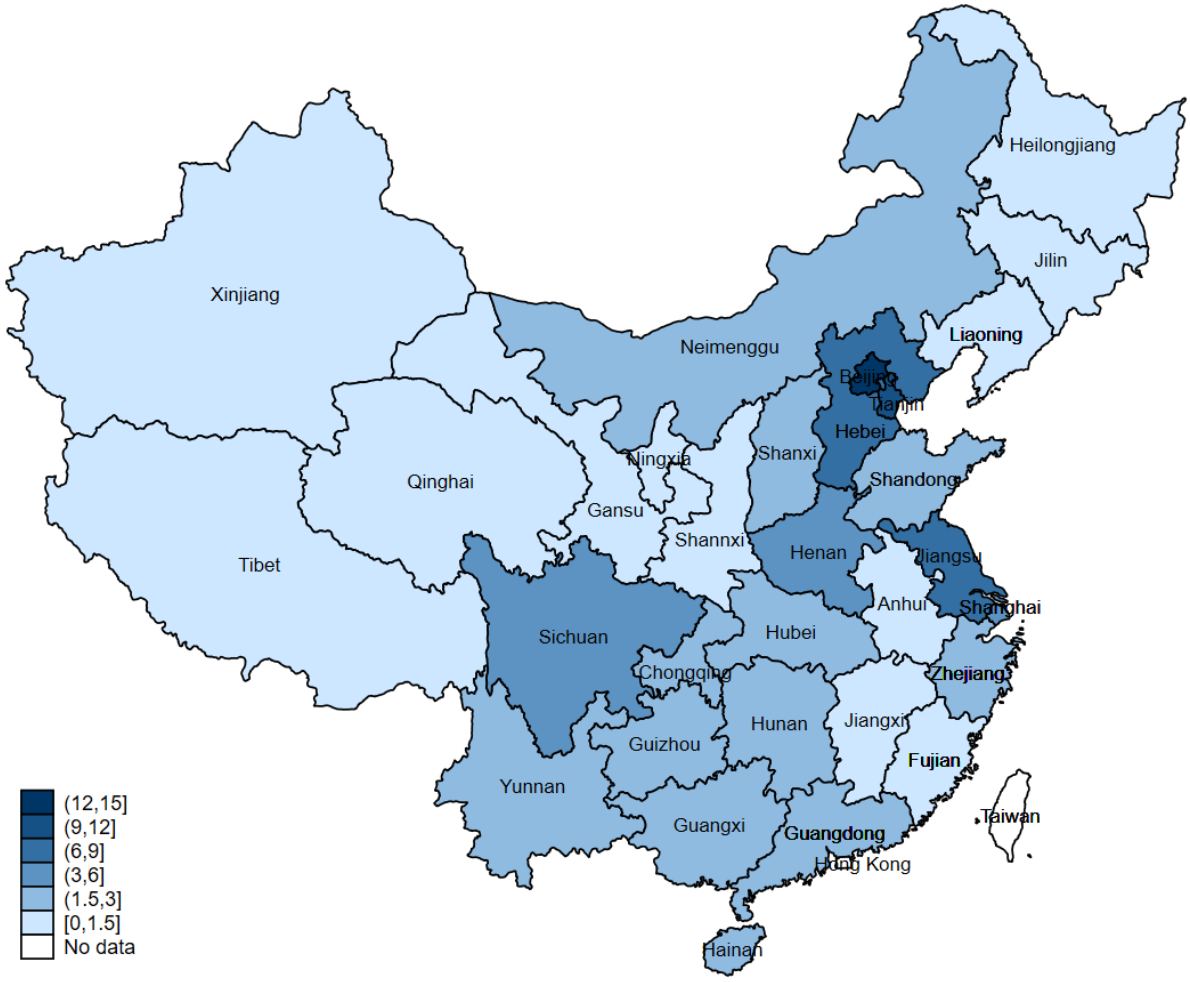


Figure IA.1 Environmental Tax Rates by Provinces

This figure illustrates the environmental protection tax rates in provincial administrative regions of mainland China. The tax rate in each provincial administrative regions is the average local tax rate across pollutants and time. The tax rate information is manually collected from local legislative documents. The sample period ends in 2021.

Table IA.1 Details of Environmental Protection Tax Law

This table provides details of the Environmental Protection Tax Law of the People's Republic of China. Panel A shows the timeline for important stages during process of the law passage. Panel B presents several significant terms of the law.

Panel A: Timeline of Law Passage

"*The Environmental Protection Tax Law of the People's Republic of China*" underwent a multi-phase legislative process. The key stages during this process are as follows:

1. **Legislative Proposal:** On November 3, 2014, the Financial and Economic Affairs Committee of the National People's Congress revealed that the Ministry of Finance, together with the Ministry of Environmental Protection and the State Administration of Taxation, had been actively progressing with the drafting of *"The Environmental Protection Tax Law of the People's Republic of China*." A draft bill was prepared and forwarded to the State Council.

2. **Public Consultation:** On June 10, 2015, the Office of Legislative Affairs of the State Council published a public notice to solicit feedback on "*The Environmental Protection Tax Law of the People's Republic of China.*" The draft bill, along with explanatory materials prepared by the Ministry of Finance, the Taxation Administration, and the Ministry of Environmental Protection, was released to gather opinions from the public.

3. **Legislative Planning:** On August 5, 2015, "*The Environmental Protection Tax Law of the People's Republic of China*" was incorporated into the legislative agenda of the 12th National People's Congress Standing Committee.

4. **Initial Review:** Between August 29 and September 3, 2016, the 22nd session of the 12th National People's Congress Standing Committee undertook the first review of "*The Environmental Protection Tax Law of the People's Republic of China (draft)*."

5. **Law Passage after Two Reviews:** On December 25, 2016, "*The Environmental Protection Tax Law of the People's Republic of China*" was enacted following a vote at the 25th session of the 12th National People's Congress Standing Committee and went into effect on January 1, 2018.

Panel B: Important Terms of the Law

"环境保护税的适用情况" (Applicable Conditions of Environmental Protection Law)

第二条　在中华人民共和国领域和中华人民共和国管辖的其他海域，直接向环境排放应税污染物的企业事业单位和其他生产经营者为环境保护税的纳税人，应当依照本法规定

缴纳环境保护税。

Article 2: Enterprises, institutions, and other production and business operators that directly emit pollutants into the environment within the territorial and maritime jurisdictions of the People's Republic of China are designated as taxpayers of the Environmental Protection Tax. These entities are required to remit the Environmental Protection Tax in accordance with the provisions set forth in this Law.

“环境保护税的减免”(Exemption of Environmental Protection Tax)

第十三条　纳税人排放应税大气污染物或者水污染物的浓度值低于国家和地方规定的污染物排放标准百分之三十的，减按百分之七十五征收环境保护税。纳税人排放应税大气污染物或者水污染物的浓度值低于国家和地方规定的污染物排放标准百分之五十的，减按百分之五十征收环境保护税。

Article 13: Taxpayers who emit taxable atmospheric pollutants or water pollutants at concentration levels 30% lower than the national and local pollutant emission standards are eligible for a 75% reduction in the Environmental Protection Tax. If the concentration levels of the emitted taxable atmospheric pollutants or water pollutants are 50% lower than the stipulated national and local pollutant emission standards, the Environmental Protection Tax will be levied at a reduced rate of 50%.

“法律实施部门”(Law Implementation Authorities)

第十四条　环境保护税由税务机关依照《中华人民共和国税收征收管理法》和本法的有关规定征收管理。

生态环境主管部门依照本法和有关环境保护法律法规的规定负责对污染物的监测管理。

县级以上地方人民政府应当建立税务机关、生态环境主管部门和其他相关单位分工协作工作机制，加强环境保护税征收管理，保障税款及时足额入库。

Article 14: The Environmental Protection Tax shall be levied and administered by the tax authorities in accordance with the *"Tax Collection and Administration Law of the People's Republic of China"* and relevant provisions of this Law.

The administrative authority for the ecological environment is responsible for the monitoring and management of pollutants in accordance with this Law and relevant environmental

protection laws and regulations.

Local governments at the county level and above shall establish a collaborative working mechanism involving tax authorities, competent ecological environment departments, and other relevant units, to enhance the levy and management of the Environmental Protection Tax and ensure the timely and full remittance of tax revenues.

“环境损害赔偿”(Penalty for Environmental Damages)

第二十六条　直接向环境排放应税污染物的企业事业单位和其他生产经营者，除依照本法规定缴纳环境保护税外，应当对所造成的损害依法承担责任。

Article 26: Enterprises, institutions, and other entities engaged in production and business activities that directly emit taxable pollutants into the environment shall, in addition to paying the Environmental Protection Tax in accordance with the provisions of this Law, be legally responsible for any damage caused by their emissions.

Table IA.2 Examples of Green Job Postings

This table presents an example of green job postings. The green-skill keywords are highlighted in bold.

岗位描述：1.根据国家安全生产及**环境保护**的法律法规和技术要求来开展日常运转工作；2.监督公司各部门在生产、研发、新改扩等活动中有关**废气**、**废水**等安全**环保**方面工作的实施，使其对员工及**环境**的影响降至最低；3.维护及更新公司相关安全、**健康**、**环境**等管理制度，进行定期的安全检查及整改处理，并组织对员工进行安全教育培训及考核；4.对工伤及安全事故进行处理并制订预防对策；5.主导职业健康管理，每年组织公司人员进行职业健康体检；6.负责对接政府部门的检查对接工作。了解易制毒、易制爆、剧毒备案流程及消防安全管理；7.落实集团总部及公司领导各项工作要求。任职要求：1.大专以上学历，化工、**环境**、安全工程等相关专业； 2.有相关 **EHS** 工作经验 3 年以上，具备危险化学品管理经验；3.工作积极主动、耐心细致，学习应变能力及沟通协调强，能独立解决安全管理方面各项问题，提出合理化建议；4.持有注册安全工程师证书优先。

Job Description: 1. Carry out daily operations in accordance with national laws, regulations, and technical requirements related to safety production and **environmental protection**. 2. Supervise various departments in the company to ensure that **waste gas, wastewater**, and other safety and **environmental aspects** are implemented during production, research and development, new projects, modifications, and expansions, minimizing the impact on employees and **the environment**. 3. Maintain and update relevant safety, **health**, and **environmental** management systems in the company, conduct regular safety inspections and rectification, and organize safety education and training for employees. 4. Handle work-related injuries and safety accidents and formulate prevention measures. 5. Take the lead in occupational health management and organize annual occupational health checks for company personnel. 6. Be responsible for connecting with government departments for inspection and coordination work. Familiar with the process of making dangerous chemicals, explosives, and toxic substances, as well as fire safety management. 7. Implement the requirements of the group headquarters and company leaders. Requirements: 1. College degree or above in chemical, **environmental**, or safety engineering related fields. 2. More than 3 years of relevant **EHS** work experience, including experience in the management of dangerous chemicals. 3. Proactive, meticulous, and strong learning ability in problem-solving and communication coordination, able to independently solve various safety management issues and provide reasonable suggestions. 4. Hold a registered safety engineer certificate is preferred.

Table IA.3 Average Percentage of Green Job Postings in Each Industry

This table reports the average percentage of green job postings by industry. A job posting is classified as a green job posting (i.e., postings that require environmentally friendly skills) if descriptions of the position's functions and responsibilities contain three or more unique keywords from the top 200 most common green-skill-related keywords. Industry classifications are based on the Guidance for Industry Classification of Listed Companies released by the CSRC. *Highly Polluting Industry* is an indicator for industries that emit significant amounts of pollutants. The sample period is between 2015 and 2021.

Industry Code	Industry Name (Chinese)	Industry Name (English)	Highly Polluting Industry	%Green Jobs
A01	农业	Agriculture	0	6.52
A02	林业	Forestry	0	7.99
A03	畜牧业	Livestock	0	8.90
A04	渔业	Fisheries	0	2.37
A05	农、林、牧、渔服务业	Agriculture, Forestry, Livestock, and Fishery Services	0	20.83
B06	煤炭开采和洗选业	Coal Mining and Washing	1	4.71
B07	石油和天然气开采业	Oil and Natural Gas Extraction	1	3.83
B08	黑色金属矿采选业	Ferrous Metal Mining and Dressing	1	2.42
B09	有色金属矿采选业	Non-ferrous Metal Mining and Dressing	1	4.78
B10	非金属矿采选业	Non-metallic Mining and Dressing	0	1.61
B11	开采辅助活动	Mining Support Activities	0	7.36
C13	农副食品加工业	Processed Agricultural Products	0	2.86
C14	食品制造业	Food Production	0	2.31
C15	酒、饮料和精制茶制造业	Beverage and Refined Tea Production	0	1.48
C17	纺织业	Textiles	1	1.18
C18	纺织服装、服饰业	Apparel and Accessories	0	0.34

Industry Code	Industry Name (Chinese)	Industry Name (English)	Highly Polluting Industry	%Green Jobs
C19	皮革、毛皮、羽毛及其制品和制鞋业	Leather, Fur, Feather (down) and Footwear	1	0.68
C20	木材加工和木、竹、藤、棕、草制品业	Wood Processing and Products of Bamboo, Rattan, Palm, and Straw	0	0.53
C21	家具制造业	Furniture	0	1.44
C22	造纸和纸制品业	Papermaking and Paper Products	1	1.50
C23	印刷和记录媒介复制业	Printing and Recorded Media	0	1.28
C24	文教、工美、体育和娱乐用品制造业	Cultural, Educational, and Sports Goods	0	0.50
C25	石油加工、炼焦和核燃料加工业	Petroleum Refining, Coking, and Nuclear Fuel Processing	1	5.05
C26	化学原料和化学制品制造业	Chemical Raw Materials and Products	1	3.53
C27	医药制造业	Pharmaceuticals	1	3.35
C28	化学纤维制造业	Chemical Fibers	1	3.47
C29	橡胶和塑料制品业	Rubber and Plastics	0	2.39
C30	非金属矿物制品业	Non-metallic Mineral Products	1	3.35
C31	黑色金属冶炼和压延加工业	Ferrous Metal Metallurgy and Rolling	1	2.49
C32	有色金属冶炼和压延加工业	Non-ferrous Metal Metallurgy and Rolling	1	3.83
C33	金属制品业	Metal Products	1	1.84
C34	通用设备制造业	General Equipment	0	3.10
C35	专用设备制造业	Special Equipment	0	2.57
C36	汽车制造业	Automobiles	0	2.89
C37	铁路、船舶、航空航天和其他运输设备制造业	Railway, Shipbuilding, Aerospace, and Other Transport Equipment	0	2.30
C38	电气机械和器材制造业	Electrical Machinery and Equipment	0	3.08
C39	计算机、通信和其他电子设备制造业	Computer, Communications, and Other Electronic Equipment	0	1.69

Industry Code	Industry Name (Chinese)	Industry Name (English)	Highly Polluting Industry	%Green Jobs
C40	仪器仪表制造业	Instruments and Meters	0	10.03
C41	其他制造业	Other Manufacturing	0	1.43
C42	废弃资源综合利用业	Waste Resource Recovery	0	11.04
D44	电力、热力生产和供应业	Electricity and Heat Production and Supply	1	7.02
D45	燃气生产和供应业	Gas Production and Supply	0	6.55
D46	水的生产和供应业	Water Production and Supply	0	12.48
E47	房屋建筑业	Building Construction	0	3.09
E48	土木工程建筑业	Civil Engineering Construction	0	6.37
E49	建筑安装业	Installation	0	3.49
E50	建筑装饰和其他建筑业	Building Decoration and Other Construction	0	1.82
F51	批发业	Wholesale Trade	0	2.09
F52	零售业	Retail Trade	0	1.33
G53	铁路运输业	Railway Transport	0	0.29
G54	道路运输业	Road Transport	0	2.42
G55	水上运输业	Water Transport	0	7.90
G56	航空运输业	Air Transport	0	2.43
G57	管道运输业	Pipeline Transport	0	0.00
G58	装卸搬运和运输代理业	Cargo Handling and Transport Agency	0	2.17
G59	仓储业	Warehousing	0	0.58
G60	邮政业	Postal Services	0	0.72
H61	住宿业	Accommodation	0	2.03
H62	餐饮业	Catering	0	0.00

Industry Code	Industry Name (Chinese)	Industry Name (English)	Highly Polluting Industry	%Green Jobs
I63	电信、广播电视和卫星传输服务	Telecommunications, Broadcasting, Television, and Satellite Transmission	0	1.25
I64	互联网和相关服务	Internet and Related Services	0	1.20
I65	软件和信息技术服务业	Software and Information Technology Services	0	1.14
K70	房地产业	Real Estate	0	3.47
L71	租赁业	Rental and Leasing	0	0.25
L72	商务服务业	Business Services	0	1.16
M73	研究和试验发展	Research and Experimental Development	0	5.91
M74	专业技术服务业	Professional, Scientific, and Technical Services	0	12.13
M75	科技推广和应用服务业	Technology Promotion and Application	0	18.56
N77	生态保护和环境治理业	Ecological Protection and Environmental Governance	0	14.84
N78	公共设施管理业	Public Facilities Management	0	5.22
O80	机动车、电子产品和日用产品修理业	Vehicle, Electronics, and Daily Product Repair	0	0.19
P82	教育	Education	0	0.88
Q83	卫生	Health	0	5.07
R85	新闻和出版业	News and Publishing	0	1.06
R86	广播、电视、电影和影视录音制作业	Broadcasting, Television, Film, and Recording Production	0	1.28
R87	文化艺术业	Cultural and Artistic Activities	0	0.58
R88	体育	Sports	0	1.04
S90	综合	Comprehensive	0	2.59