

Online Pollutant Data Index of Publicly-Listed A-Share Companies Annual Report

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Online Pollutant Data Index of Publicly-Listed A-Share Companies

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February 2, 2016

Acknowledgements

Many thanks to SEE Foundation for providing financial support. The content and opinions of this report represent the authors' personal point of view, regardless of the position or policies of SEE Foundation.

Thank you to Green Qilu and other local environmental organizations for their great assistance in participating in and carrying out the work for this project.

Thanks to the Securities Times Data Center for their support in extracting key data from publicly-listed companies' regular reports.

Finally, thank you to all of the experts who provided thoughts, expertise and recommendations during the writing of this report.

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Overview

Since the 2008 implementation of the Measures on Environmental Information Disclosure (Trial), China's environmental information disclosure has gradually become more transparent. In particular, since the passage of the Measures on Self-Monitoring and Information Disclosure for Key State-Monitored Enterprises (Trial) in July 2013, various provincial environmental protection bureaus (EPBs) have set up monitoring platforms for key pollution sources and have standardized the real-time disclosure of online monitoring data from key monitored enterprises in their respective administrative jurisdictions. Online monitoring data information disclosure for key monitored enterprises has positively disrupted traditional publication methods of environmental supervision information, providing a convenient tool for the public to supervise pollutant emissions from such enterprises.

In January 2015, the Securities Times and IPE jointly launched the "Publicly-Listed Company Online Monitoring Data Pollutant Index" project (or "Environmental Index," for short). Leveraging real-time disclosure of online monitoring data for pollution sources, publicly-listed companies were matched up with their subsidiaries and controlled affiliates (hereafter referred to "publicly-listed companies and their affiliates") based on companies' regular reports. Enterprises were regularly screened for compliance against publicly disclosed self-monitoring data for key monitored enterprises collected in real-time from 30 provincial-level EPB websites. Environmental risk was directly calculated based on the time length of emissions exceeding standards and multiple of excess emissions indicated by the discharge point, and the index was published and updated each Tuesday.

The project's primary purpose is to create a tool that can provide investors with comprehensive information regarding environmental risk of publicly-listed companies. At the same time, through responsible investment, it can steer public companies to save energy and reduce emissions, and promote control and management of smog.

The Environmental Index tracked 1365 key monitored enterprises that belong to a total of 519 publicly-listed companies, and which can be divided into 25 distinct industries as classified by Shenying & Wanguo Securities (SWS)¹. In the year 2015, the index was published a total of 49 times, with publicly-listed companies from the chemical, public utilities and non-ferrous metals industries appearing most often.

During the monitoring period, a total of 141 publicly-listed companies and their affiliates were placed on the index ("indexed"). Of these, 28 enterprises have provided responses, and most of

¹ See here for SWS' industry classification system: http://202.109.73.180/en_swzs/swwhyflsm.pdf.

these have subsequently achieved emissions compliance. It is worth noting that the majority of indexed enterprises have not provided feedback pertaining to their excessive emissions or details for corrective measures. This situation represents the apathetic behavior that exists at many corporations with regards to their environmental responsibility and their lack of attention to reputational risk, and also reflects the fact that the costs associated with legal actions pertaining to environmental noncompliance are too low to affect investment behavior.

Only around 40% of the indexed public companies received an official supervision record during the year that they were tracked, showing that self-monitoring data indicating excess emissions has room to become even stronger as a method and tool for strengthening the regulatory capacity of local EPBs. At the same time, from the perspective of law enforcement impartiality, many of the indexed enterprises are located in cities with relatively robust self-monitoring information disclosure, signifying that for some areas that do not yet disclose self-monitoring information for heavy polluting enterprises, enterprises may be avoiding penalties, creating an unfair situation for enterprises that are already disclosing their self-monitoring data. As such, we suggest that if a reasonable assessment of the impact of environmental risk on businesses is to be made, a push must be made for comprehensive disclosure from key state-monitored enterprises, and support provided for public disclosure of self-monitoring information for key monitored enterprises at the provincial and municipal levels.

In the study, we found that the current environmental penalties are still quite insufficient to act as an appropriate indicator of environmental risk for investors. The strength of environmental penalties, effectiveness of information disclosure, and disclosure of follow-up supervision and enforcement information all must be heightened. Since the implementation of the new Environmental Protection Law and its supporting measures, enterprises that violate environmental laws can be subject to daily fines, creating a powerful societal mechanism for severely cracking down on polluters and increasing the costs associated with violating the law. However, in practice, there are still companies that continue to exceed emissions standards without receiving daily fines, as well as companies that have received daily fines and continue to exceed emissions standards without changing their behavior.

Contents

1. Publicly-Listed Companies Selected for Online Pollutant Data Tracking.....	1
(1) Sample covers 1365 key state-monitored enterprises that belong to a total of 519 publicly-listed companies.....	1
(2) Report scope covers nearly 90% of industries.....	1
(3) Report scope extends to 30 provincial-level administrative units.....	2
2. Analysis of the Compliance Situation of Publicly-Listed Companies' Pollutant Emissions Online Monitoring Data.....	3
(1) 141 publicly-listed companies and their affiliates were listed on the index due to emissions exceeding standards.....	3
(2) Seven publicly-listed companies or their affiliates were indexed over 25 times.....	3
(3) Over 80% of indexed enterprises are key state-monitored enterprises.....	4
(4) Shandong, Anhui and Hubei are the top three provinces home to the most companies placed on the index.....	6
(5) Chemicals, public utilities and building materials are the top three industries for excess emissions based on online monitoring data.....	8
(6) The total number of indexed companies from the Shanghai Stock Exchange far exceeded that of other stock exchanges.....	9
3. Company Feedback: Characteristics and Case Analysis.....	11
(1) Viewpoints of company feedback varied in perspective.....	14
(2) Enterprises from Shandong were the most responsive.....	15
(3) Major events transpire, furthering the importance of the index's supervisory role.....	15
(4) Response speed is emblematic of the importance companies assign to environmental management.....	16
(5) The majority of responding corporations are capable of achieving online monitoring data compliance within a planned timetable.....	17
4. Analysis of Environmental Supervision Records for Indexed Companies.....	19
(1) In 2015, 40% of indexed companies received environmental supervision records or incurred penalties.....	19
(2) Analysis of indexed companies' environmental performance.....	19
(3) Classification of environmental penalties received by indexed corporations in 2015.....	20
5. Analysis of the Status of Online Data Disclosure for Publicly-Listed Key State-Monitored Enterprises.....	22
(1) 90% of relevant enterprises already disclose their data.....	22
(2) Wastewater disclosure rates are relatively low.....	23
(3) Xinjiang, Chongqing and other areas still have not disclosed real-time online data.....	24
(4) Six publicly-listed companies have many subsidiaries that have not disclosed relevant data.....	25
(5) In 2015, penalties incurred by enterprises that have yet to engage in online data.....	

disclosure totaled 5,427,400 RMB	28
6. Conclusions and Recommendations	31
(1) Conclusions	31
(2) Recommendations.....	33
Appendix 1: 2016 Implementation Timeline of Key Wastewater, Air Emissions and Sewage Policies Relevant for Publicly-listed Companies	36
Appendix 2: Explanation of research methods for online pollutant data index of publicly-listed companies.....	36
(1) Research Scope	36
(2) Data Sources	36
(3) Research Period.....	36
(4) Calculation Methods	36
(5) Disclaimer	37

1. Publicly-Listed Companies Selected for Online Pollutant Data Tracking

(1) Sample covers 1365 key state-monitored enterprises that belong to a total of 519 publicly-listed companies

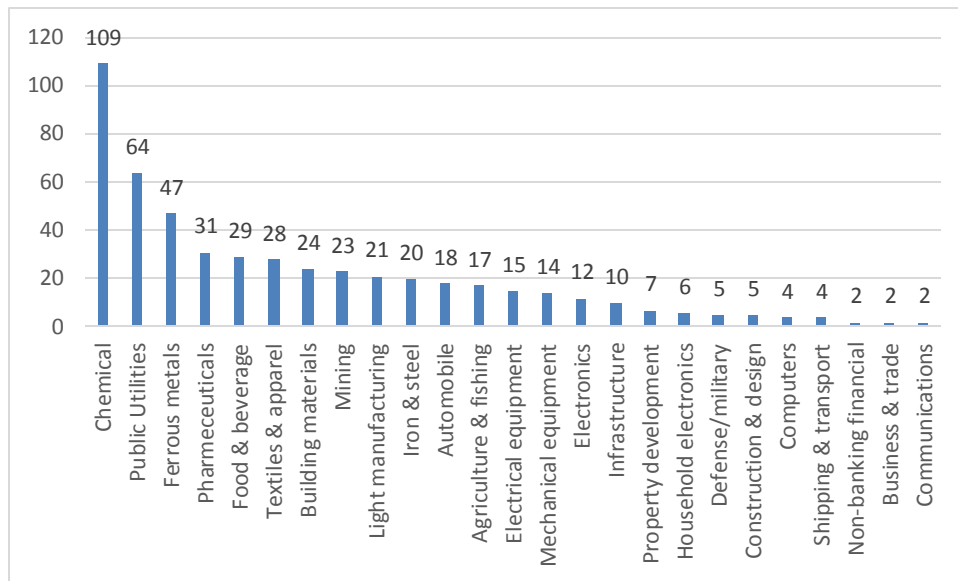
A total of 1365 key state-monitored enterprises were selected for tracking. These enterprises were chosen by examining the most recent annual and biannual reports for publicly-listed companies and their subsidiaries and cross-checking them with the names of companies listed on the 30 self-monitoring data platforms across China that have already implemented online real-time data disclosure. The enterprises included for tracking are affiliated with a total of 519 publicly-traded companies. As of December 29, 2015, these 519 public corporations had a market capitalization totaling over 12 trillion RMB, comprising 23.49% of the total market value of listed A-shares, which are priced at 53 trillion RMB. As a point of comparison, the average market value of an A-share corporation was 24 billion RMB. The total market capitalization of China Petroleum alone accounted for over 1 trillion, while 16 public companies exceeded the 100 billion mark, encompassing 79 key state-monitored enterprises. Public companies with market cap below 10 billion RMB totaled 249 and encompass 465 key-controlled enterprises.

(2) Report scope covers nearly 90% of industries

In terms of industrial classes, in accordance with the "Shenwan Industrial Classification (2014 Edition)" guidelines on industrial classifications, 89.28% of the tracked enterprises can be classified into 25 different industry categorizations, thus providing a wide range for analysis. As illustrated in Figure 1, the chemical, public utilities, and non-ferrous metal industries are the top three industries with greatest number of public corporations tracked.

SWS industrial classification is largely determined based on operating income and operating profit.

Figure 1. Industry distribution of subjects tracked for the Environmental Index

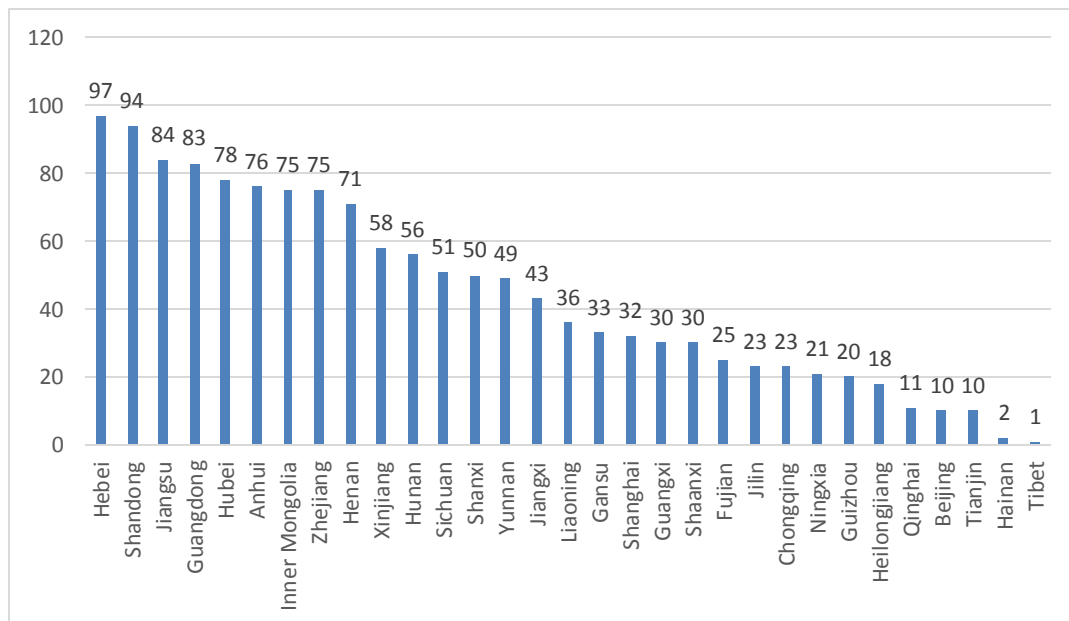


(3) Report scope extends to 30 provincial-level administrative units

From a geographical perspective, the dataset covers enterprises designated as key monitored enterprises for pollution source emissions that fall under the jurisdiction of 30 different provincial-level administrative units. The provinces with the highest number of tracked enterprises are Hebei, Shandong and Jiangsu.

Figure 2. Regional distribution of public companies tracked for the Environmental Index

(Unit: Company)



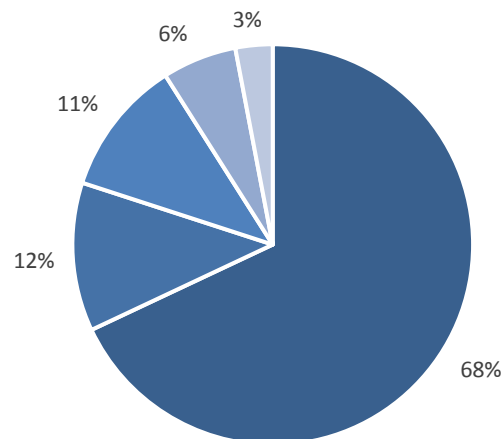
2 . Analysis of the Compliance Situation of Publicly-Listed Companies' Pollutant Emissions Online Monitoring Data

Between December 29, 2014 and December 29, 2015, the monitoring data for the above subjects was tracked, and the Securities Times and the Institute of Public & Environmental Affairs (IPE) regularly published the "Online Data Pollutant Index for Publicly-Listed Companies" each Tuesday on a weekly basis. In total 49 editions were published, providing an extensive dataset to scrutinize to yield the following statistical conclusions:

- (1) 141 publicly-listed companies and their affiliates were listed on the index due to emissions exceeding standards

During the monitoring period, in total, 141 publicly-listed companies and their affiliates were placed on the index. From the perspective of affiliations and relationships, 99 of these were subsidiary companies, accounting for nearly 70% of the indexed enterprises, as shown in Figure 3. Other types of affiliates included 18 company headquarters, 16 branch companies, eight key joint ventures, as well as four other jointly-owned or jointly-operated companies.

Figure 3: Relationships between key monitored enterprises placed on the index and publicly-listed companies



■ Subsidiaries ■ Headquarters ■ Branch Companies ■ Key Joint Ventures ■ Other Jointly Owned or Jointly Operated Ventures

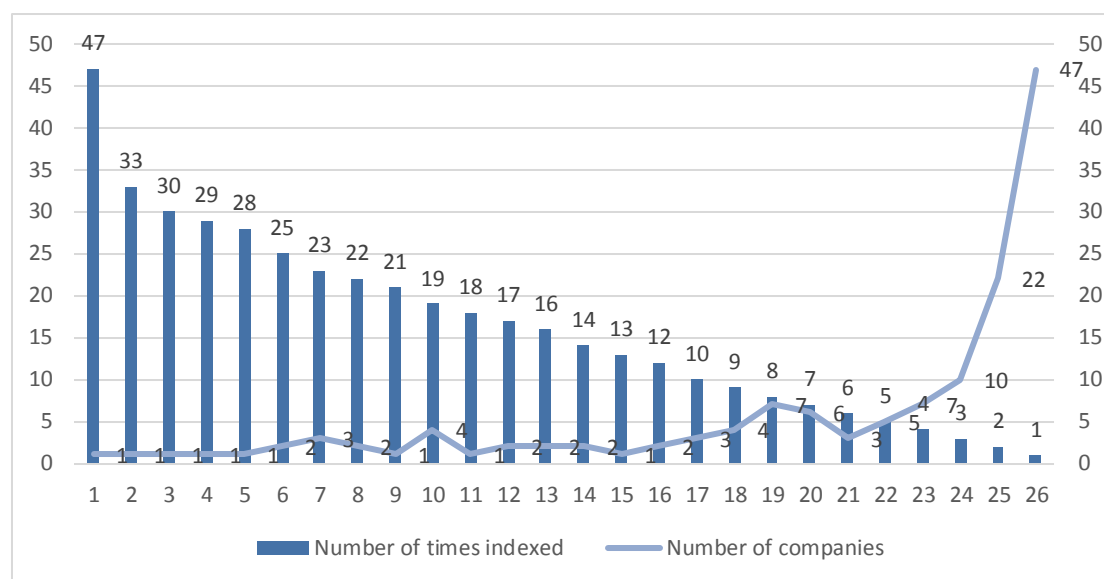
- (2) Seven publicly-listed companies or their affiliates were indexed over 25 times

Seven publicly-listed companies and their affiliates were indexed over 25 times, signifying that these companies were listed on the index over half of the time. Many other companies were placed

on the index fewer than ten times, while 47 key pollution source publicly-listed companies and their affiliates were only placed on the index once.

This data illustrates the fact that the pollutant emissions of many key publicly-listed companies and their affiliates occasionally exceed emissions standards. The index used continuous tracking of enterprises' performance, and communication was maintained with indexed companies, so as to learn of enterprises' actual emissions situation in a timely manner and pass on information about enterprises' environmental management and control.

Figure 4. Number of times that publicly-listed companies and their affiliates were listed on the index

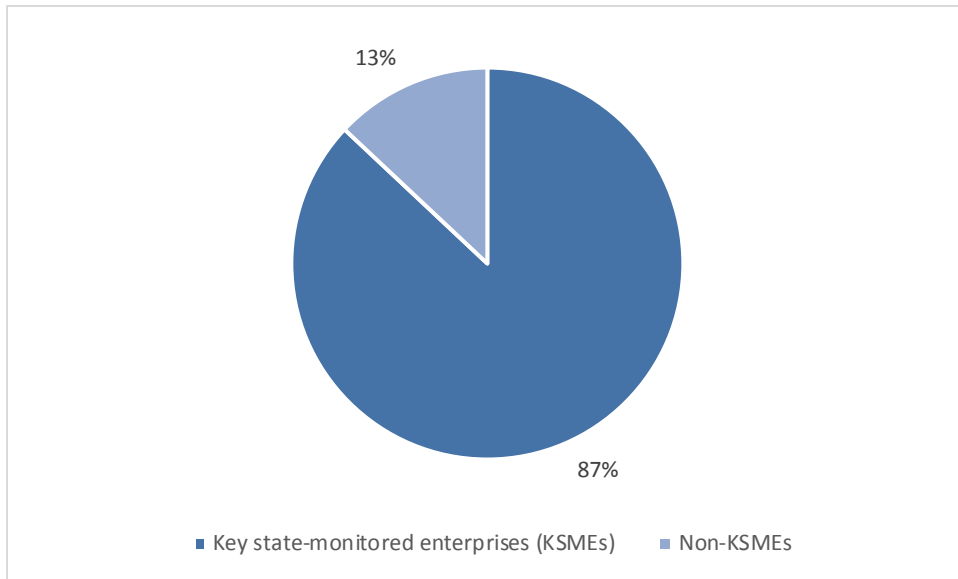


(3) Over 80% of indexed enterprises are key state-monitored enterprises

As shown in Figure 5, 87% of the publicly-listed companies and their affiliates that were indexed during the monitoring period are designated as key state-monitored enterprises (KSMEs). This information in itself is chiefly derived from the key state-monitored enterprises on provincial-level platforms for the publication of self-monitoring information,² and is related to the robustness of disclosure for key state-monitored enterprises' online pollutant emissions data.

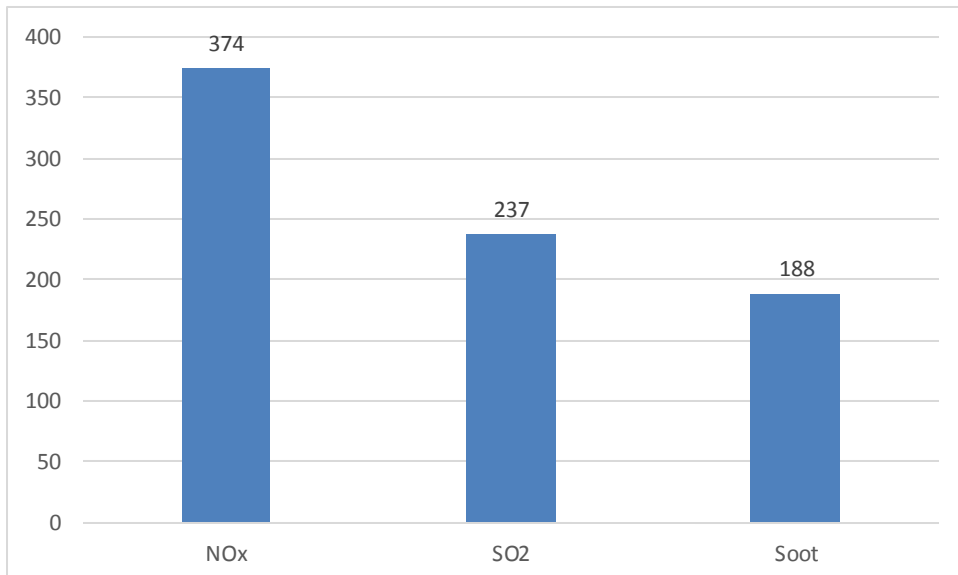
² Provincial-level publication platforms for key pollution source self-monitoring information primarily publish key state-monitored pollution sources' self-monitoring data, while a portion of the information published on these platforms is self-monitoring data for key pollution sources monitored at the provincial level or the municipal (city) level.

Figure 5. Classification of key monitored enterprises placed on the index



As shown in the tracking results for air emissions in Figure 6, enterprises were most often indexed due to their NO_x emissions exceeding standards, followed by emissions for SO₂ and soot, indicating that there is still ample room for improving control of NO_x emissions. On average, NO_x levels exceeded standards by a multiple of 1.33 times with SO₂ levels averaging 1.74 times the standard and soot levels, 0.93 times.

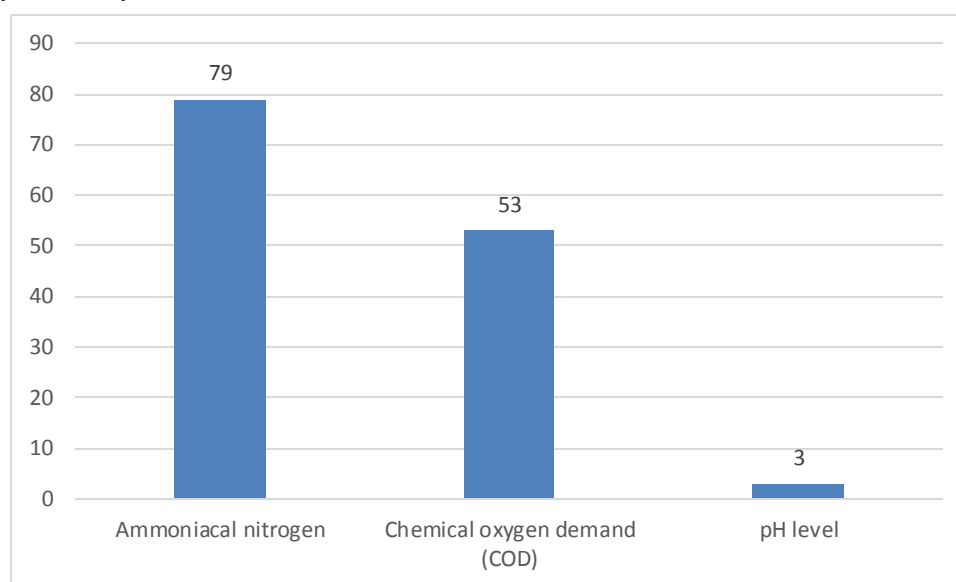
Figure 6: Statistical analysis of the number of times that various air emissions pollutants caused an enterprise to be placed on the index



From May 2015 onwards, the Environmental List began tracking the online monitoring of industrial wastewater discharge. Upon examining indicators for wastewater discharge, levels of ammoniacal nitrogen were in excess in the vast majority of cases surveyed, followed by levels for chemical

oxygen demand (COD) and then pH levels. This data shows that more improvement is needed in terms of controlling enterprises' ammoniacal nitrogen and COD discharge. Ammoniacal nitrogen levels were, on average, over the limit by 1.36 times, while organic pollutants came in at 0.92 times, and pH only 0.08 times.

Figure 7: Statistical analysis of the number of times that various wastewater pollutants caused an enterprise to be placed on the index



In mid-April 2015, the State Council issued the "Water Pollution Prevention and Control Action Plan" (hereinafter referred to as the "Water 10 Plan"), naming the papermaking, coking, nonferrous metal, fertilizer, printing and dyeing, processed agricultural foodstuff, manufacturing, tanning, pesticide and electroplating industries as special key targets for control. Anhui Liuguo Chemical Company, Zhejiang Kan Specialty Materials, Kailuan Energy Chemical Company and their subsidiaries and affiliates are some of the companies that have been listed on the index multiple times for exceeding wastewater pollutant limits.

(4) Shandong, Anhui and Hubei are the top three provinces home to the most companies placed on the index

During the monitoring period, according to the location of operations for the indexed companies, altogether 22 provinces were covered by the index. Shandong, Anhui and Hubei are at the very top of the list as the three provinces that are home to the most indexed corporations. Regions that were not present on the index include Beijing, Tianjin, Chongqing, Qinghai, Guangxi, Shanxi, Sichuan and Hainan. This is not to say that these areas necessarily had no companies in violation of emissions standards; rather, we believe that the degree of compliance, number of enterprises disclosing real-time online monitoring information, and publication status of data on disclosure platforms are all interrelated factors that influence a region's presence (or lack thereof) on the

index.

Figure 8: Geographical distribution of key monitored publicly-listed companies and their affiliates that were placed on the Environmental Index

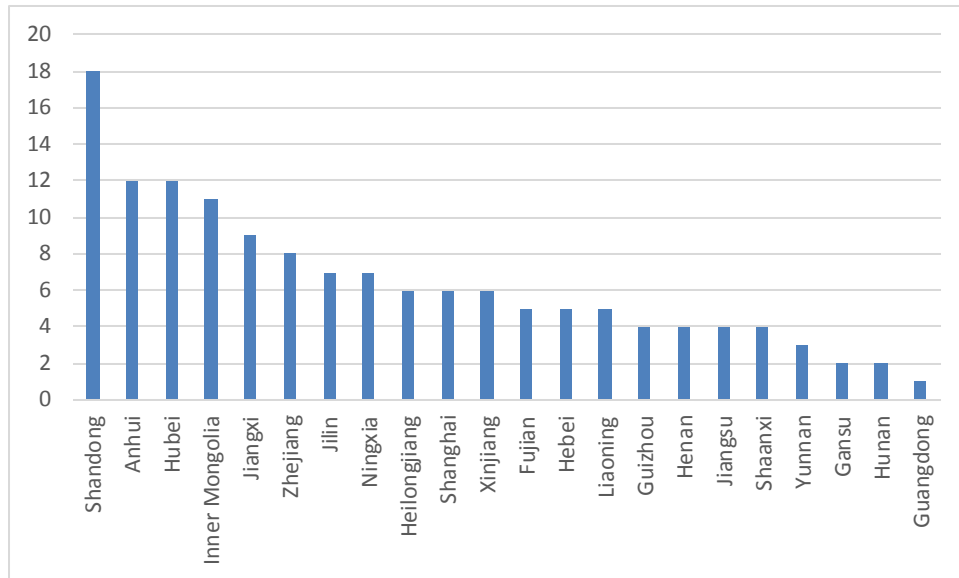
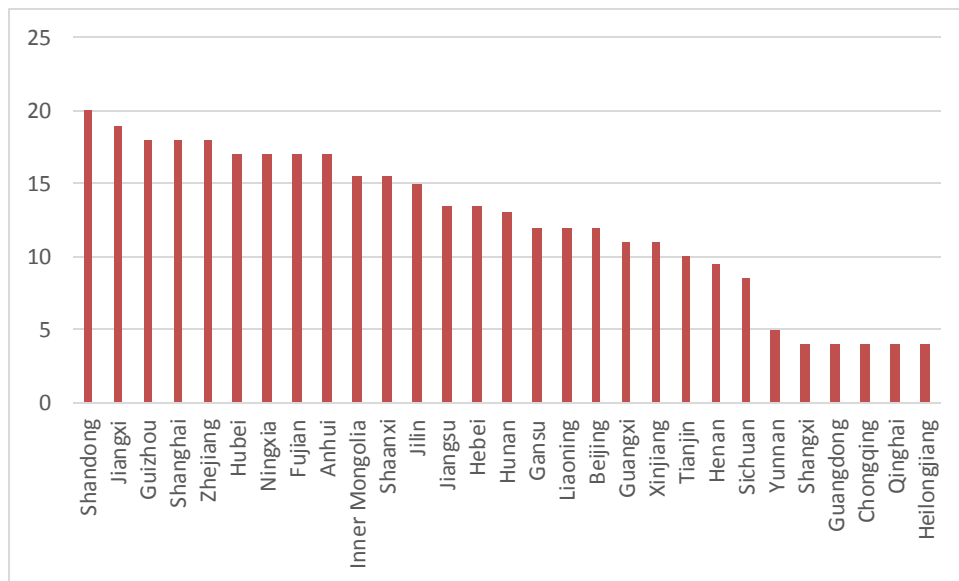


Figure 9: 2014-2015 Pollution Information Transparency Index (PITI) self-monitoring information disclosure provincial scores



In comparison with IPE’s 2014-2015 Annual Pollution Information Transparency Index (PITI) Assessment Report of 120 Cities, indexed companies were overrepresented in the provinces which scored higher for their self-monitoring information platforms, such as Shandong, Anhui, Hubei, Inner Mongolia, Jiangxi, Zhejiang and Ningxia, as these platforms publicized information more completely, and their overall quality of information continues to be relatively high. On the other hand, Chongqing and Qinghai have yet to make an appearance on the Environmental Index, and

unsurprisingly the scores allocated to their self-monitoring information platforms happen to be among the lowest.

Differences in the status of online data publication in different provinces reveal discrepancies in the level of environmental disclosure across various provinces. The present levels of information disclosure are relatively higher in provinces with higher totals of indexed corporations, and provinces with inadequate information disclosure subsequently have lower totals of indexed corporations. Apart from the often stark difference in excess emissions behavior across key monitored enterprises, the main reason for such differences across regions lies with the differences in the publishing processes for various regions. Online data real-time publishing is helpful for societal supervision and environmental law enforcement, which then pushes companies to implement emissions compliance and improve environmental management. Recently, the CPC's Ningxia Party Committee's 7th plenary session passed Ningxia's 13th five-year plan, which encourages all polluting enterprises to implement online monitoring and for excess emitters to be heavily penalized. At the same time, Beijing has already implemented disclosure of city-level enterprise online monitoring data, and Shenyang has promoted disclosure of online monitoring data for enterprises monitored at the city level. Our project group analysts believe that the above information indicates more corporations will implement online monitoring in the future, and on-site inspections of enterprises will increasingly be supported by real-time data.

(5) Chemicals, public utilities and building materials are the top three industries for excess emissions based on online monitoring data

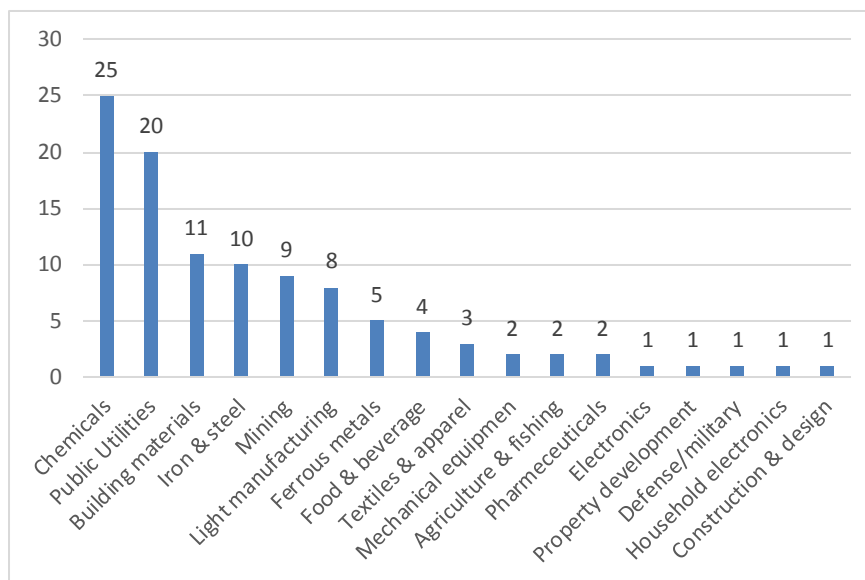
During the monitoring period, based on the industry classifications for publicly-listed companies laid out in the "Shenwan Industry Classification (2014 edition)," companies that exceeded emissions standards hailed from a total of 17 different industries. The three industries indexed most often are chemicals, public utilities and building materials. This report's research mainly focuses on air emissions and wastewater pollutant emissions, and thus shows that the outlook is not optimistic for the environmental compliance situation of industrial wastewater and air emissions for publicly-listed companies of the three aforementioned industries, as well as for municipal wastewater treatment plants and other relevant enterprises.

According to the SWS industrial classifications, the chemical industry's sub-sectors consist of petrochemicals, chemical raw materials, chemical products, chemical fibers, plastics, and rubber. The public utilities industry sub-sectors include electricity, water, gas, and environmental engineering and services. The building materials industry consists of cement manufacturing, glass manufacturing and other building materials.

From this, it can be seen that apart from the traditional key industries for air pollution control, such

as iron and steel, cement, electricity and glassmaking, the compliance situation of air emissions and wastewater discharge from the chemical industry equally merits attention.

Figure 10: Industry distribution (SWS) of the publicly-listed companies affiliated with key monitored enterprises whose emissions exceeded standards

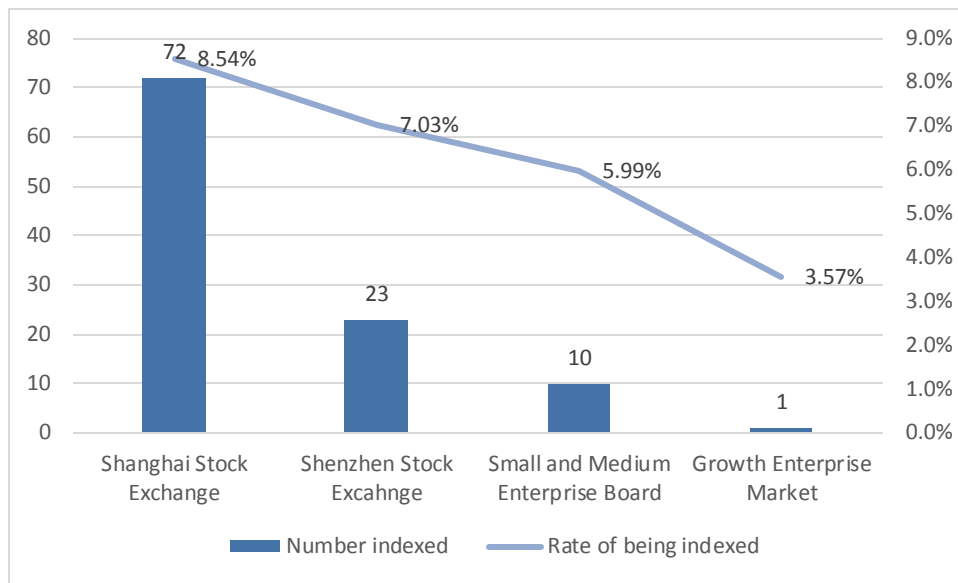


(6) The total number of indexed companies from the Shanghai Stock Exchange far exceeded that of other stock exchanges

Enterprises from the Shanghai Stock Exchange comprised over 60% of the overall research scope. Looking at the status of the final index, there were far more indexed enterprises from the Shanghai Stock Exchange than from the Shenzhen Exchange, the Small and Medium Enterprise Board and the Growth Enterprise Market.

Secondly, comparing the rate at which enterprises were indexed, the Shanghai Exchange is home to the highest percentage of corporations indexed, at 8.54%. Based on China's Annual Publicly-Listed Company Yearbook, the number of publicly-listed companies traded on the Shanghai Stock Exchange is much greater than that of the Shenzhen Stock Exchange. Therefore, when looking at absolute totals, the overall percentage of indexed companies that are traded on Shanghai Exchange seems reasonable. Another key indicator, the rate at which key publicly-listed companies for pollutant emissions and their affiliates were listed on the index, is also higher for the Shanghai Exchange than for the Shenzhen Exchange. The above two points together indicate that at present, there is ample room for improving the compliance of online pollutant emissions for companies listed on the Shanghai Stock Exchange.

Figure 11: Stock exchange distribution of key monitored enterprises that exhibited excess emissions during the monitoring period



3. Company Feedback: Characteristics and Case Analysis

During the evaluation period, a total of 28 companies responded to their being placed on the list, and at present the majority of them have essentially achieved emissions compliance. Company feedback mainly exhibits the following characteristics.

Chart 1: List of companies that responded to being placed on the index

#	Indexed Company Name	# of times ranked	Company Region	Affiliated Publicly Listed Co.	Stock #	Emissions Type	Relevant Affiliate	Ownership percentage (%)	Response Method	Response Speed	Cooperate with the Report?
1	Xinjiang XHD Mining Co., Ltd	47	Xinjiang	Jiugang Hongxing	600307	Air Emissions	Subsidiary	100.00	Local EPB	Over a week	Yes*
2	Xinjiang Guanghui New Energy Co. Ltd.	33	Xinjiang	Guanghui Energy	600256	Air emissions Wastewater	Subsidiary	100.00	Telephone Email	Over a week	Yes*
3	Guozhong (Qinhuangdao) Sewage Treatment Co., Ltd.	30	Hebei	Guozhong Water	600187	Wastewater	Subsidiary	100.00	Local EPB	Over a week	Yes
4	China Aluminum Shandong Co., Ltd.	28	Shandong	China Aluminum	601600	Air emissions	Subsidiary	100.00	Telephone, Local Communication	Same Day	Yes*
5	Shanghai Shenergy Xinghuo Thermo-electric LLC	23	Shanghai	Shenergy Shares LLC	600642	Air emissions	Subsidiary	75.00	Telephone, Email	Same Day	Yes
6	Dafeng Sunshine Thermo-electric LLC.	23	Jiangsu	Jiangsu Sunshine	600220	Air emissions	Subsidiary	100.00	Telephone, Email	Same Day	Yes*
7	Shandong Jinjing Technology	21	Shandong	Jinjing Technology	600586	Air emissions	Mother Company	-	Telephone, Email	Same Day	-

	Shares Co., Ltd.										
8	Zhongzhou Aluminum Co., Ltd.	19	Henan	China Aluminum	601600	Air emissions	Subsidiary	100.00	Telephone, Local Communication	Same Day	Yes*
9	Shandong Hailong Shares Co., Ltd.	16	Shandong	*ST Hailong	600677	Air emissions	Branch Co.	-	Telephone	Less than a week	-
10	Yucheng Xinyuan Thermal Power Co., Ltd.	14	Shandong	Tongyu Heavy Industry	300185	Air emissions	Joint Owned and Operated Co.	46.24	Weibo	Less than a week	No*
11	Zaozhuang Tengzhou Jinjing Glass Co., Ltd.	12	Shandong	Jinjing Technology	600586	Air emissions	Subsidiary	92.85	Telephone, Email, Local Communication	Same Day	Yes*
12	Shenhua Shendong Power LLC Guojiawan Plant	9	Inner Mongolia	China Shenhua	601088	Air emissions	Branch Co.	100.00	Telephone, Email	Same Day	-
13	SDIC Xinjiang Luobupo Hoevellite Co., Ltd	8	Xinjiang	Guannong Co., Ltd.	600251	Air emissions	Joint Owned and Operated Co.	20.30	Telephone	Same Day	No*
14	Jiande Conch Cement LLC	8	Zhejiang	Conch Cement	600585	Air emissions	Subsidiary	100.00	Telephone, Weibo	Over a week	Yes
15	Shandong Pharmaceutical Glass Co., Ltd.	8	Shandong	Shandong Pharmaceutical Glass	600529	Air emissions	Mother company	-	Local EPB	Over a week	-
16	Shanghai Wujing Power Generation Co., Ltd.	8	Shanghai	Shenergy Shares Co., Ltd.	600642	Air emissions	Joint Owned and Operated Co.	50.00	Telephone, Email	Same Day	No*

17	Pingxiang Jiaohua Co., Ltd.	7	Hunan	Sangang Minguang	002110	Air emissions	Joint Owned and Operated Co.	5.56	Telephone	Same Day	No*
18	Xinjiang Bayi Iron and Steel Baicheng Co., Ltd.	6	Xinjiang	Bayi Iron and Steel	600581	Air emissions	Subsidiary	94.00	Telephone	Same Day	Yes*
19	Fujian Qingshan Paper Industry Co., Ltd.	6	Fujian	Qingshan Paper	600103	Air emissions	Mother company		Public Announcement	Less than a week	-
20	Anhui Huatai Forest Pulp & Paper Co., Ltd.	4	Anhui	Huatai Shares Co., Ltd.	600308	Air emissions	Subsidiary	85.00	Telephone, Email, In- person meeting	Same Day	Yes*
21	Jiujiang Hewen Lake Environ- mental Protection Co., Ltd	4	Jiangxi	Beijing Capital Co., Ltd.	600008	Wastewater	Subsidiary	65.00	Phone, In- person meeting	Same Day	Yes*
22	Ningbo Changfeng Thermo- electric Co., Ltd.	4	Zhejiang	Youngor Group	600177	Air emissions	Subsidiary	50.00	Phone, Email	Less than a week	Yes*
23	Fujian Datang International Ningde Power Generation Co., Ltd	2	Fujian	Datang Power	601991	Air emissions	Subsidiary	51.00	Phone	Same Day	Yes*
24	Huadian Qingdao Power Generation Co., Ltd.	1	Shandong	Huadian International	600027	Air emissions	Subsidiary	55.00	Phone, Email	Same Day	Yes
25	Huadian Qudong Power	1	Henan	Huadian International	600027	Air emissions	Subsidiary	90.00	Phone, Email	Less than a week	Yes

	Generation Co., Ltd.										
26	China Cement Co., Ltd.	0	Jiangsu	Conch Cement	600585	-	Subsidiary	100.00	Phone, Email	Same Day	Yes
27	Sanhe Power Generation LLC	0	Hebei	Jingneng Power	600578	-	Joint Owned and Operated Co.	30.00	Phone	Active Communication	No*
28	Xinghu Biochemical Pharmaceutical Factory	0	Guangdong	Xinghu Technology	600866	-	Branch Co.	100.00	Public Announcement, Email	Same Day	-

Note: Consolidated financial statements marked with an * indicate that the enterprise is a key subsidiary, key non-wholly-owned subsidiary, or a key joint venture. According to the "Standard Content and Format of Information Disclosure for Companies that Publicly Issue Securities, No. 2 – Annual Report Content and Format," these three types of enterprises must independently report within regular reports.

(1) Viewpoints of company feedback varied in perspective

Of the 28 companies supplying feedback, many directed their responses toward explaining their reasons for excess emissions.

However, some companies also questioned the validity of the index. For example, some companies believe that since the scope of companies tracked for research includes publicly-listed companies' subsidiary and branch companies with which they do not have a relationship, and levels of investment in these are also not large, so therefore they should not be placed on the index. However, the reason for the key monitored enterprise being integrated into the scope of tracked companies is that the enterprise contributes to over 10% of the publicly-listed company's profits.

According to stipulations set out in the China Securities Regulatory Commission's "Standard Content and Format of Information Disclosure for Companies that Offer Public Securities, No. 2 – Annual Report Content and Format," if a single subsidiary's net profit or shares of the company account for more than 10% of the net profit of the parent company, then the subsidiary company is considered to produce a significant impact on the parent company, and thus must be individually analyzed in the "analysis of key controlling shareholders" section of the report.

In addition, other companies questioned the data's accuracy, and details of the calculation methods.

(2) Enterprises from Shandong were the most responsive

Of the 28 total companies that supplied responses, seven are based in Shandong. Particularly worth mentioning is that three Shandong corporations that violated emissions standards requested face-to-face communications the same day that the index was released, including some large-scale national enterprises.

Aluminum Corporation of China, Ltd. (Shandong) (hereafter referred to as “Chalco Shandong”) is China's first aluminum oxide manufacturer and a major player in the aluminum industry. Entering into operation on July 1, 1954 as one of 156 key national projects during the first five-year plan, it is widely known as the "cradle of China's aluminum industry." For some time, the Chinese aluminum oxide industry has been in a downturn, and enterprises have run into many operational difficulties. Monitoring data shows that beginning at the end of January, Chalco Shandong's air emissions began to persistently exceed emissions standards. After the release of the index, Chalco Shandong immediately contacted the project team. According to representatives of the corporation, the company's manufacturing devices are old and worn out, and the difficulty and cost of implementing environmental improvements is immense, but they had already started making arrangements with their local EPB to undergo environmental renovations. After 28 weeks on the index, Chalco Shandong was finally able to achieve the emissions compliance and was subsequently taken off the list.

Other companies from Shandong that established regular communication with us include Jinjing Science & Technology and its subsidiaries, Huatai Shares and some of Huadian Power International's affiliates.

It is our opinion that active communication from enterprises in Shandong and the Shandong EPBs' emphasis on public participation and law enforcement are inextricably linked.

(3) Major events transpire, furthering the importance of the index's supervisory role

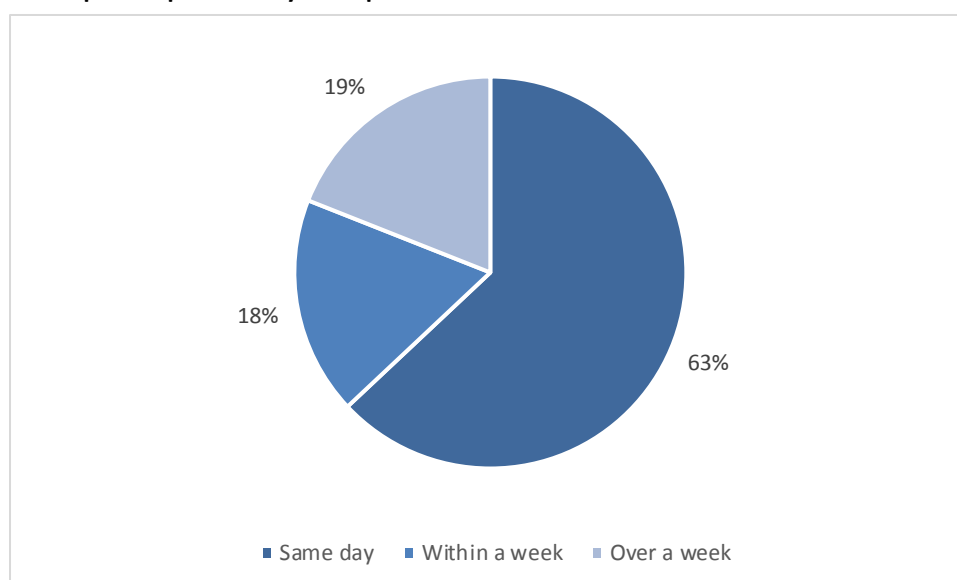
Qingshan Paper is one of the leading paper-making enterprises in Fujian, and is a key major enterprise in China's pulp and paper industry. In the explanatory article accompanying the last Environmental Index published before the 2015 Chinese New Year, our project group pointed out Qingshan Paper's issues with their online data exceeding emissions standards, and proposed that Qingshan Paper consider putting aside 3.2 billion RMB it had dedicated to another project to instead be earmarked for important technical upgrades to alleviate environmental concerns. On the same day as the article's publication, the price of Qingshan Paper's stock – which had twice before reached the daily upper limit on the price of a stock – continuously dove until market close. Within seven days after the end of the Spring Festival, Qingshan Paper gave two announcements,

detailing their power plant's excessive emissions issues and explaining their planned technical upgrades. During the start of 2015's bull market, Qingshan's share price did not begin to move again until they company issued its second explanation. However, since then, emissions from all of their power plants have achieved compliance, and Qingshan has not been troubled by being listed for its excess emissions.

In early July 2015, in the analysis accompanying the 28th edition of the index, the project group targeted issues of excessive emissions at Shenhua Power's Guojiawan Power Plant. Right around that time, the factory received an official denitration approval letter from the Shaanxi Provincial EPB. The index was published the same day, and the relevant factory staff contacted our project team, providing documentation proving that their soot emissions were not in violation of the required standards. After verifying with the provincial EPB, our working group found that the factory's two units jointly shared a single smokestack without a separation plate, leading to the mixing together of air emissions. The data on the Shaanxi Provincial Information Publication Platform for Key State-Monitored Enterprises comes from a CEMS system (Continuous Emission Monitoring System) data collection apparatus. It is impossible to discard the abnormal data, so it still shows that emissions are exceeding standards.

(4) Response speed is emblematic of the importance companies assign to environmental management

Figure 12: Response speed of key enterprises listed on the index



Out of the entire sample studied, 17 enterprises achieved a same day response rate, while four companies responded within a week, showing that the majority of companies that responded did so quickly.

In the 14th edition of the index, the accompanying article noted the excess emissions of Huadian International's Huadian Qingdao Power Generation Co. Ltd. and Huadian Qudong Power Generation Co. Ltd. Both companies subsequently contacted the project group within a week, and provided a written explanation of their emissions violations, reflecting the importance attached to environmental management and reputation.

(5) The majority of responding corporations are capable of achieving online monitoring data compliance within a planned timetable

Based on the current corporate self-monitoring data, the majority of companies that provided responses are already exhibiting compliance with emissions standards.

In early 2015, not long after the release of the index's 3rd edition, Shenergy Shares, whose affiliated company, Shanghai Shenergy Xinghuo Thermal Power LLC (hereafter referred to as "Xinghuo Thermal Power") responded to their subsidiary's excess emissions issue. Company representatives stated that as a publicly-listed corporation, Shenergy Shares has a responsibility to take their own environmental performance and their impact on society extremely seriously, as well as that of any of their subsidiary enterprises. In the response, the company showed that in 2014, Xinghuo Thermal Power, in accordance with requirements laid out in the Ministry of Environmental Protection's document "On the issuance of the notice titled 'Plan and Timeline for Controlling Air Pollution from Key Industries in the Yangtze River Delta Region'" (MEP [2014] No. 169), Shenergy had started the denitration renovation process for four of their boilers, in order to implement their "coal to gas" transition for reducing NO_x emissions and achieving emission targets. This renovation is also part of the "Shanghai Clean Air Action Plan (2013-2017)", which is slated to be completed by 2017. At the same time, in accordance with EPB stipulations, Xinghuo Thermal Power must submit regular updates on the coal boiler denitrification process, which they forecasted to be completed by July 1, 2015, when the Ministry of Environmental Protection is slated to publish relevant emissions requirements. In early July, the project group received a response from Shenergy Shares. According to the company, Xinghuo Thermal Power No. 1 through No. 3 boilers had already completed their denitration renovations as of July 1, and met the emissions standards. The No. 4 Boiler was continuing to undergo renovation work, and would shut off on July 1, wait for renovation work to be completed, and then restart once emissions targets are reached. After the renovation period deadline, the project group, via the Shanghai platform, verified the implementation of emissions targets by units No. 1 through No. 3, and Xinghuo Thermal Power will no longer be indexed. We believe the response of Shenergy Shares was timely, detailed, and in conjunction with concrete achievements for renovation, which clearly showed the company's active attitude towards environmental issues and information disclosure.

However, not all of the indexed companies made satisfactory progress in equipment renovations. Aside from the previously mentioned case, the indexed company Xinjiang XHD Mining LLC from Xinjiang province suffered many setbacks in reaching its environmental performance emissions targets. XHD's main operations lie in iron ore mining. In April 2015, the city Environmental Protection Bureau of Hami in Xinjiang announced on its Weibo that XHD Mining will, in accordance with the EPB's requirements, complete its flue gas desulfurization project by July 30, thereby contributing to the area's overall emissions reduction target. However, as early August arrived, the project group became familiar with the many issues plaguing XHD's environmental renovations. Eventually, after their long period atop the index, in December 2015 Xinjiang XHD Mining Co., Ltd. stated that they had moved the flue gas desulfurization renovation into the trial phase, and predicted that upon completion SO₂ emissions could be reduced to meet the national target of less than 200 mg, a desulfurization percentage of 96%. We believe that due to the domestic price drop in steel and subsequent drop in revenue from sales of their main product, the production operations of this enterprises as well as many other enterprises have struggled. However, even in the face of such strong economic headwinds, the fact that companies continue to raise money and invest in environmental renovations reflects the importance that corporations attach to maintaining their responsibility in taking care of their local environment.

4. Analysis of Environmental Supervision Records for Indexed Companies

(1) In 2015, 40% of indexed companies received environmental supervision records or incurred penalties

During the monitoring period, of the 141 listed companies and their affiliates that were placed on the index, 50 of them (or approximately 40%) received environmental supervision records or environmental fines or penalties. The fact that only 40% of the companies indexed for environmental emissions violations were found by EPB environmental inspections to have environmental problems shows that there still exists a large discrepancy between EPBs' online monitoring results and environmental law enforcement.

At present, the resources for supervisory monitoring and enforcement are still not adequate to meet monitoring requirements, so online monitoring can and should serve as an important supervisory means and tool to identify enterprises' emissions problems. The comprehensive and timely disclosure of online monitoring data, and the guarantee of data accuracy and quality will contribute to the comprehensive identification of environmental risks to businesses and corporations.

(2) Analysis of indexed companies' environmental performance

Indexed Corporations in 2015 had 141 environmental supervision records, including:

- 122 records of excess pollutant emissions, with 26 companies exceeding emissions standards on multiple occasions;

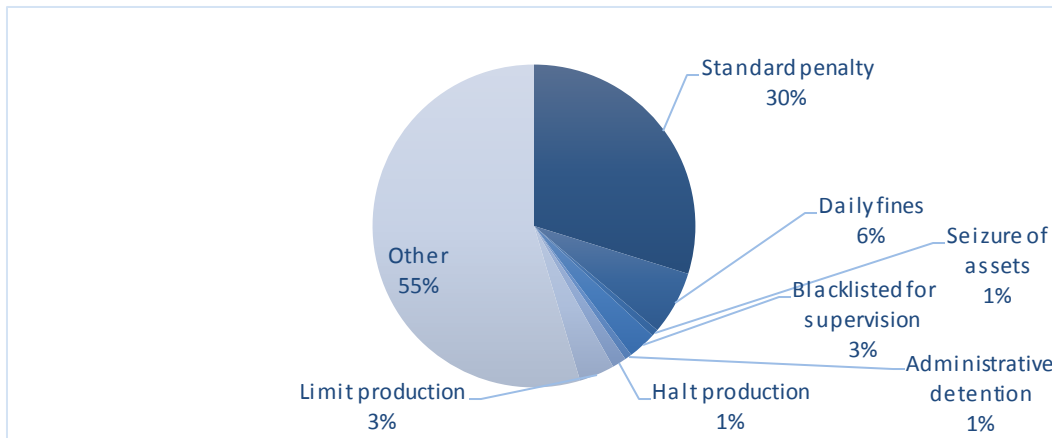
Figure 13: Total number of environmental supervision records for indexed enterprises in 2015



- Three companies (Ningxia Xin'an Technology Ltd., Guozhong (Qinhuangdao) Sewage Treatment Co., Ltd., and Jiangxi Liuguo Chemical LLC) were found to secretly release emissions without reporting them or to discharge directly to the environment without treating their emissions, or to have tampered with online monitoring equipment and falsified data, making for reprehensible illegal behavior. Of these three companies, one of them – Ningxia Xin'an Technology Ltd. – falsified its online data monitoring data, resulting in the EPB placing the responsible persons in administrative detention for seven days.
- Two companies (Anhui Huatai Forest Pulp & Paper Company, Yunan Jinding Zinc Industrial Co., Ltd) were found to have violated environmental impact assessment (EIA) procedures and were thus issued serious penalties, such as being blacklisted or being ordered to suspend production.

(3) Classification of environmental penalties received by indexed corporations in 2015

Figure 14: Categories of environmental penalties received



(Note: The "other" classification includes supervisory monitoring results that show excessive emissions but did not specify a penalty, treatment deadline or renovation targets.)

In total there were 52 fines issued, totaling 25,040,800 RMB. Nine of these were in the form of daily penalties totaling 8,909,900 RMB, or 36% of the total value of penalties. China Petroleum Jilin Petrochemical Branch Company alone accumulated 5 separate instances of daily penalties, totaling 3,870,000 RMB. Additionally, China Aluminum Zhongzhou Co., Ltd., Wuhan Gaoxin Thermolectric Co., Ltd., China Petroleum Jilin Petrochemical Ltd., Jiangxi Liuguo Chemical Co., Ltd., and Dalian Petrochemical Company of China Petroleum and Natural Gas Co., Ltd. were respectively issued total sums of 2.32 million, 2.1 million, 900,000, 319,900 and 300,000 RMB in daily fines.

Apart from daily penalties, 13 indexed companies that exhibited illegal environmental behavior faced stringent environmental-related punishments, including seizure of property and assets,

administrative detention, orders to limit or suspend production, as well as being blacklisted for supervision. Nine of the 13 companies were penalized for exceeding emissions on multiple occasions. However, fines and other standard types of penalties still comprised the majority of environmental penalties issued.

5. Analysis of the Status of Online Data Disclosure for Publicly-Listed Key State-Monitored Enterprises³

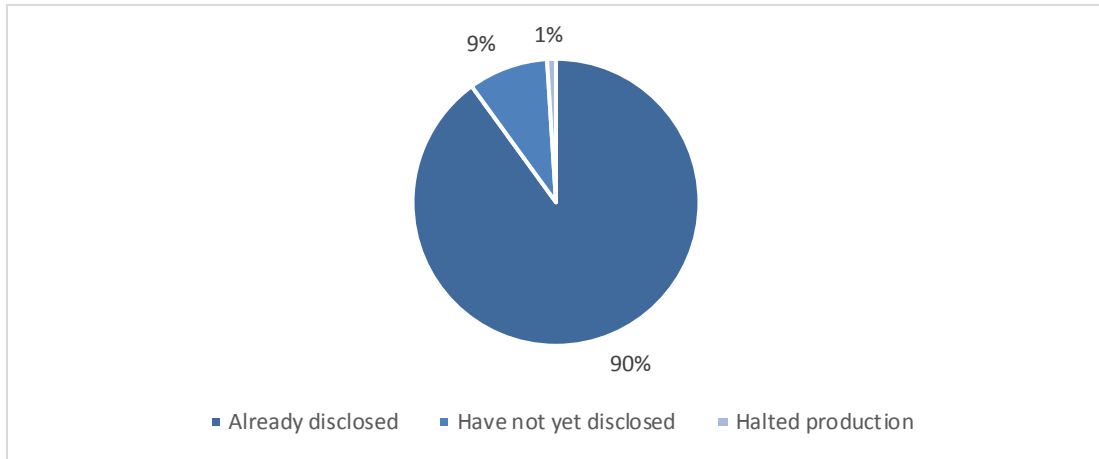
(1) 90% of relevant enterprises already disclose their data

Upon comparison with the national list of key state-monitored enterprises, of the 14,920 key state-monitored enterprises designated for supervision at the national level, 1365 are publicly-listed companies or their affiliates, comprising 9.15% of the list. Among this subset, 982 are required to disclose their data. In 2015, 886 companies implemented online data disclosure, 13 companies' production had been halted as shown on self-monitoring platforms, and 83 companies' online data still needs to be disclosed. The status of these enterprises' disclosure is shown in Figure 15.

Presently, close to 10% of key state-monitored enterprises affiliated with publicly-listed companies do not yet disclose their real-time online monitoring data. This practice violates the stipulations laid out in the Measures on Self-Monitoring and Information Disclosure for Key State-Monitored Enterprises (Trial) and the Pollution Source Environmental Supervision Information Disclosure Catalog. Also, the successive implementation of the new Environmental Protection Law and new amendments to the Air Pollution Prevention and Control Law have added further requirements for key air emissions entities and their online monitoring data disclosure, thus expanding the scope of enterprises that are obligated to disclose pollutant source online monitoring information, and further clarifying relevant penalties and punishments for enterprises that have not yet disclosed data. On January 12, the Beijing, Tianjin and Hebei regions hosted a meeting on air pollution prevention work. At the meeting, Minister for Environmental Protection Chen Jining proposed to strengthen "high stack" pollution management, calling for the installation of national key-controlled "high stack" comprehensive online monitoring equipment to be completed by the end of the first quarter and for real-time monitoring data to be disclosed, and for enterprises that do not meet their emissions targets to be ordered to halt production. Concurrently, MEP should publicly issue quarterly reports listing out the names of those key state-monitored enterprises that exhibit long-term issues meeting emissions standards so as to accept public supervision. In the future, key state-monitored enterprises affiliated with publicly-listed companies that have yet to disclose their online monitoring data will likely face even greater risk of harsh penalties.

Figure 15: Online information disclosure situation for key state-monitored pollution sources affiliated with publicly-listed companies

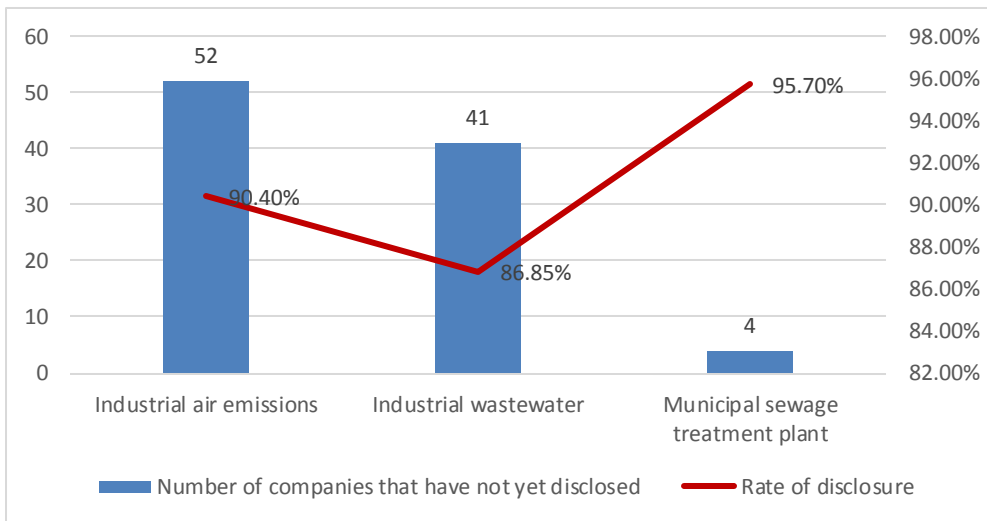
³ A portion of the statistical results and averages are based on data published by provincial-level self-monitoring information publication platforms on January 21, 2016.



(2) Wastewater disclosure rates are relatively low

Looking at key state-monitored enterprises affiliated with publicly-listed companies, 52 companies have not yet disclosed online data pertaining to industrial air emissions, 41 companies have not disclosed industrial wastewater data, and four municipal sewage treatment plants have yet to disclose their data. Respective disclosure rates are 90.40%, 86.85%, and 95.70%.

Figure 16: Publicly-listed companies and their affiliates designated for monitoring at the national level that have not yet disclosed data online



Specifically, the rate of online data disclosure for key state-monitored enterprises designated for wastewater monitoring is the lowest. At present, key statutes in China's Air Law raise clear requirements for information disclosure for enterprises that discharge air pollutants. Public recognition toward air quality and government emphasis on controlling air pollution has also promoted the full disclosure of these enterprises' online data. In 2015, the introduction of the "Water Ten" serves as a signal allowing China to upgrade the level of control of water-related

environmental problems and improve the level of control of wastewater pollution sources. In the future, it is likely that online monitoring data will become increasingly important as a method for public supervision and a basis for environmental enforcement, so corporations must continue progressively expanding their level of information disclosure for wastewater emissions and achieve emissions compliance to avoid risks from exceeding emissions standards.

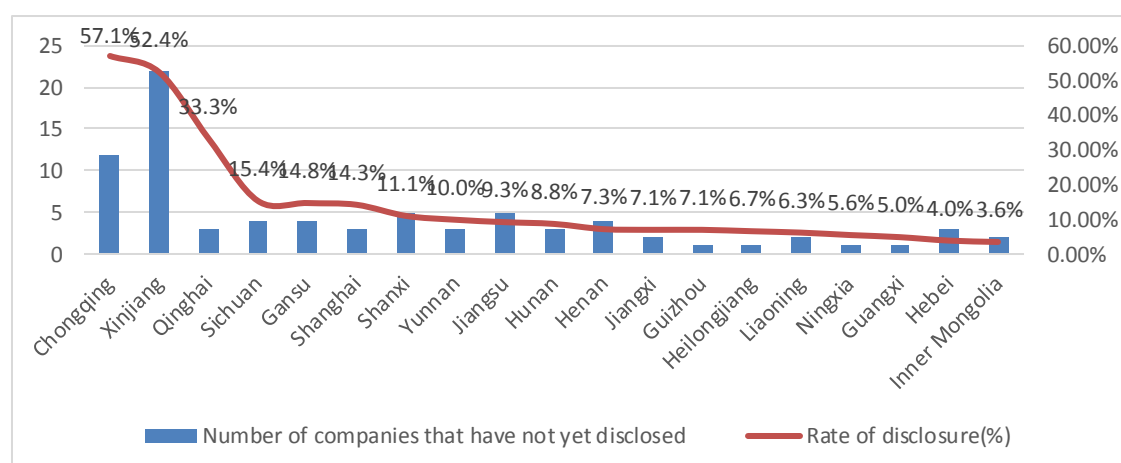
Chart 2: Pollutant disclosure status of key state-monitored pollution sources affiliated with publicly-listed companies (Unit: Number of enterprises)

	No Disclosure	Halt Production	Already Disclosed	Required to Disclose	Disclosure Rate
Air emissions	52	6	546	604	90.40%
Wastewater	41	7	317	365	86.85%
Sewage Treatment	4	0	89	93	95.70%

(3) Xinjiang, Chongqing and other areas still have not disclosed real-time online data

During the monitoring period, a total of 83 publicly-listed companies and their affiliates designated for monitoring at the national level did not disclose their data. Analyzing this data from a regional perspective, 22 regions disclosed data from all pollutant emissions points of publicly-listed companies and their affiliates, while at present, Chongqing and Xinjiang are the areas with the highest number of enterprises that have not yet disclosed online data.

Figure 1: Geographic distribution of publicly-listed companies and their affiliates designated for monitoring at the national level that have not disclosed data online



Note: Tibet was excluded from this list. Tibet is home to one non-disclosing enterprise, but because Tibet has not yet built a disclosure platform for self-monitoring information, it was not included in the current evaluation's

statistics.

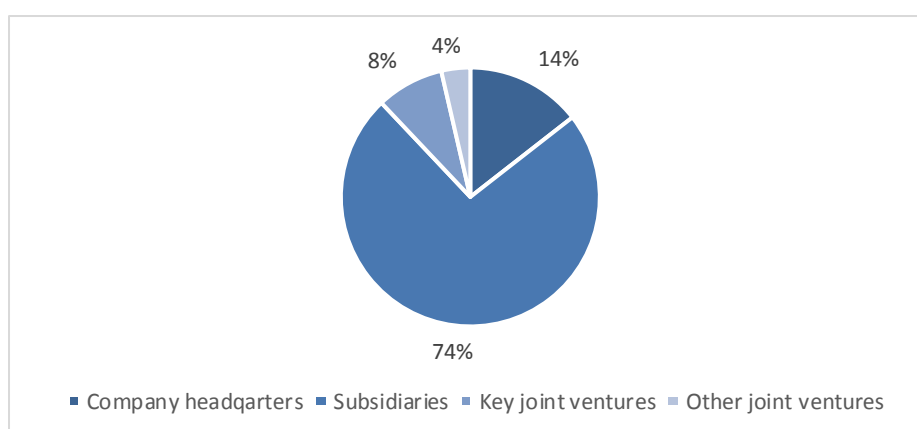
Referring to the results of IPE's 2014-2015 annual Pollution Information Transparency Index (PITI) evaluation of 120 cities, the proportion of non-disclosing enterprises is higher in such provinces as Chongqing, Qinghai, and Sichuan where provincial self-monitoring platforms score at the very bottom of the PITI index.

Although currently 30 provinces have already established online data publication platforms, large gaps still exist between various provinces' platforms in terms of enterprise coverage, data comprehensiveness, and regularity of publication. Areas such as Chongqing and Xinjiang are home to a high number of key monitored corporations for wastewater and air emissions, but the above statistics and results partly reflect that there are still issues with the level of disclosure on these areas' publication platforms. As China strengthens monitoring and control of enterprises' environmental performance, the level of enforcement in midwestern regions will inevitably increase, so pushing for comprehensive disclosure of online monitoring data for key state-monitored enterprises is an important prerequisite for improving regional environmental performance.

(4) Six publicly-listed companies have many subsidiaries that have not disclosed relevant data

Of the 83 total affiliate companies, 12 are company headquarters, 61 are subsidiaries, seven are jointly owned or operated companies, and three are other forms of joint ventures. The various types of company structures are illustrated in Figure 18.

Figure 18: Makeup of publicly-listed companies and their affiliates that have not yet disclosed online monitoring data



12 parent companies did not disclose online monitoring data, illustrated in Table 3.

Table 3: List of publicly-listed companies showing the scope of those key monitored entities that have not yet disclosed online monitoring data

Name	Stock Number	Market Value (as of 12.29 Unit: 100 million RMB)	Region	Industry	Stock Exchange	Net Profit (x 10000 RMB)	Reason for monitoring	Record of Environmental Penalty?
*ST Chuanhua	000155	47.19	Sichuan	Chemicals	Shenzhen	-11226.39	Wastewater	No
Lansi Technology	300433	572.42	Hunan	Electronic	Growth Enterprise Market	-73360.80	Wastewater	No
Maiquer Group	002719	63.90	Xinjiang	Food and Beverage	SME Board	2338.26	Wastewater	No
Qingqing Barley Wine	002646	102.29	Qinghai	Food and Beverage	SME Board	18443.41	Wastewater	No
*ST Antai	600408	50.24	Shanxi	Mining	Shanghai	-23614.80	Air emissions	Yes
TISCO Stainless Steel	000825	232.41	Shanxi	Steel	Shenzhen	6392.22	Sewage, air emissions, wastewater	Yes
Aurora Opto-electronics Co	600666	367.35	Chongqing	Pharmaceutical	Shanghai	11119.47	Wastewater	No
Yilite Wine	600197	64.47	Xinjiang	Food and Beverage	Shanghai	13236.70	Wastewater	No
Yutong Group	600066	495.48	Henan	Automotive	Shanghai	94617.54	Wastewater	No
Jianfeng Chemicals	000950	56.59	Chongqing	Chemicals	Shenzhen	-19241.51	Wastewater	No
Sansheng Special Material	002742	64.04	Chongqing	Building materials	SME Board	5433.91	Air emissions	No
Changan Automotive	000625	641.99	Chongqing	Automotive	Shenzhen	508526.65	Wastewater	Yes

From the table, one can see that for the monitoring scope of the index, the majority of companies that have yet to disclose their online data are those that are designated for monitoring of wastewater emissions, including enterprises in the chemical, food and beverage, pharmaceutical, and electronics industries. According to environmental statistics, these industries' water pollution emissions are already significant, so any excessive emissions of wastewater pollutants poses extra environmental risk because the volume of wastewater discharge is already so high. A lack of online data conflicts with the interests of both environmental authorities and the public, and the potential environmental problems from these types of industries are difficult to discern, so they post a significant yet latent environmental risk.

During the monitoring period, there were six publicly-listed companies affiliated with multiple enterprises that do not yet disclose online data: Qingsong Construction, *ST Antai, Hongda Shares, Huaxin Cement, Jidong Cement, and Qilan Mountain.

Chart 4: Publicly-listed companies affiliated with multiple key state-monitored enterprises that do not disclose online data

Name	Stock Number	Market Value (12.29 Unit: 100 Million RMB)	Region	Industry	Stock Exchange	Net Profit (Ten thousand RMB)	Number of Non-disclosing Companies
Qingsong Construction	600425	79.14	Xinjiang	Building materials	Shanghai	-23265.59	7
*ST Antai	600408	50.24	Shanxi	Mining	Shanghai	-23614.80	2
Hongda Shares	600331	153.82	Sichuan	Non-ferrous metals	Shanghai	-9294.29	2
Huaxin Cement	600801	77.14	Hubei	Building materials	Shanghai	8883.05	2
Jidong Cement	000401	150.38	Hebei	Building materials	Shenzhen	19757.09	2
Qilan Mountain	600720	69.09	Gansu	Building materials	Shanghai	68491.78	2

From the perspective of the publicly-listed companies, the building materials industry is home to the majority of listed companies with affiliates that have not yet disclosed online data, most of

which are located in the midwestern regions of China. Due to regional differences in information disclosure efforts, the level of data disclosure for affiliates of publicly-listed companies varies widely in different areas. Many companies in the building materials industry performed relatively poorly, reflecting the fact that the wider industrial environmental information disclosure level is quite low. Following the implementation of the Air Law and other statutes and regulations, companies that are required to disclose information but do not engage in disclosure will be increasingly liable to receive fines and penalties, so to avoid the increasing risk of steep environmental penalties, such publicly-listed companies should act as soon as possible.

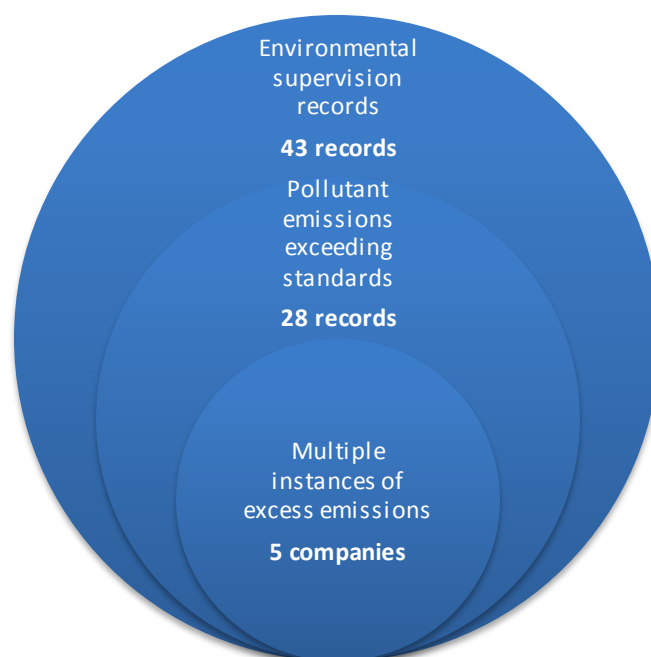
(5) In 2015, penalties incurred by enterprises that have yet to engage in online data disclosure totaled 5,427,400 RMB

According to data collected by IPE, 15 of the companies who had not yet disclosed data online in 2015 received penalties that totaled 5,427,400 RMB.

➤ **Factual analysis of environmental violations for corporations that do not yet disclose data**

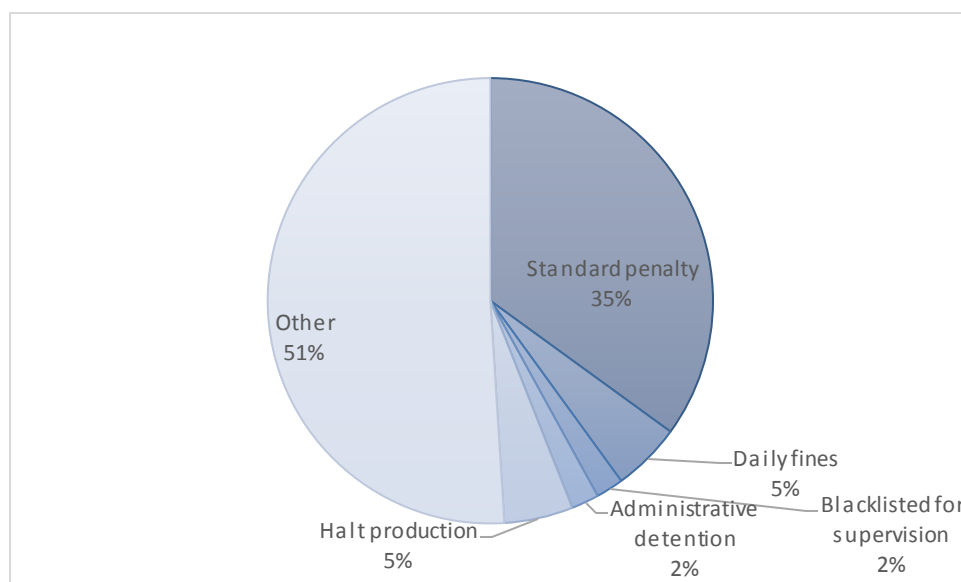
Of the companies that do not yet disclose online data, a total of 43 were found to have environmental supervision records. Of those 43 companies, 28 records related to pollutant emissions exceeding standards, with five enterprises exhibiting excess emissions upon multiple occasions.

Figure 19: Environmental supervision records for companies that do not yet disclose online data in 2015



- (1) China Cement Factory Co., Ltd. tampered with its online monitoring equipment or falsified its data, leading the municipal environmental procuratorate to issue an administrative penalty of 200,000 RMB; the company was also required to hand over an emissions fee of 2,600,000 RMB. The responsible parties at the company were accused of tampering with and falsifying monitoring data, and sentenced to 5 days' administrative detention.
 - (2) Four companies (Dalian Shipbuilding Industrial Group, Lianyungang SECCO Waste Disposal, Mulei County Yihua Donggou Mining, and Inner Mongolia Wuhai Chemical) were found to have violated Environmental Impact Assessment (EIA) procedures. Two of these companies (Dalian Shipbuilding and Lianyungang SECCO Waste Disposal) were ordered to halt production.
- Analysis of types of environmental penalties issued to companies that have not yet disclosed data

Figure 20: Types of environmental penalties issued to companies that have not yet disclosed data



Based on the chart, the greatest proportion of environmental supervision records are classified as "other," which is due to such situations as emissions having exceeded standards but the relevant authorities having not yet determined the appropriate penalty, administration deadline or raised forth remediation requirements.

There were 19 penalties levied to the companies that do not yet disclose online data, totaling 5,427,400 RMB. These penalties include two instances of daily penalties that together total 1,930,000 RMB, comprising approximately 36% of the total fines. Shanxi Stainless Steel Co., Ltd., alone was fined 1,650,000 RMB.

In 2015, of the enterprises affiliated to non-disclosing companies, some enterprises received numerous environmental penalties such as fines, daily penalties, orders to halt production and other severe penalties. Two companies exhibited multiple instances of excess emissions and were subjected to daily penalties or multiple fines. One of these companies was Dalian Shipbuilding Industrial Group, whose supervisory monitoring data results from March 26, 2015 showed total concentration of suspended solids in its effluent to be 34 mg/L, and a total phosphorus concentration of 2.3 mg/L. These readings exceeded the Liaoning Province Integrated Wastewater Discharge Standards (DB21/1627-2008), which stipulate that suspended solids in wastewater discharge must be limited to 20 mg/L, with phosphorus concentration limited to 0.5 mg/L. Therefore, Dalian Shipbuilding exceeded the legal limit by respective multiples of 0.7 and 3.6. On April 29, 2015, an investigation into the environmental violation was carried out and samples were collected, with monitoring results showing total phosphorus concentration of the wastewater to be 1.02 mg/L, which was still in excess of the legal limit by 1.04 times. Thus, from April 16 through April 29 the company was subjected to daily penalties of 280,000 RMB.

Online data can reflect a given enterprise's environmental performance in real-time. Through online data disclosure, EPBs can better discover and push for corrective actions at companies that violate environmental regulations. Companies themselves can also use the data as a form of early-adoption methods for improving environmental performance and avoiding heavy costs to their operations and production.

6. Conclusions and Recommendations

(1) Conclusions

1 . The level of online monitoring information disclosure for key monitored enterprises that are publicly-listed or affiliated with publicly-listed companies is higher than that for key state-monitored enterprises as a whole

The Measures on Self-Monitoring and Information Disclosure for Key State-Monitored Enterprises (Trial) clearly requires that, in order to better understand the relationship between the entity's emissions and the surrounding environment, each key state-monitored enterprise must organize and carry out environmental monitoring activities in accordance with the requirements of any and all such environmental protection laws and regulations. Moreover, each enterprise is responsible for the truthfulness, accuracy, and completeness of the content of self-monitoring results and other information disclosed. According to the Ministry of Environmental Protection's latest issue of the China Environmental Bulletin, as of the end of 2014, of the 14,462 key state-monitored enterprises nationwide, 73.2% of those – or a total of 10,597 companies – had carried out self-monitoring. Furthermore, according to the project team's statistics, approximately 90% of publicly-listed companies and their affiliates designated for monitoring at the national level had disclosed online monitoring data, a higher percentage than overall figure for key state-monitored enterprises as a whole.

Apart from Tibet, each provincial-level environmental protection bureau nationwide has already constructed a platform for data publication. Based on study of the companies designated for tracking for this report, 90% of publicly-listed companies and their affiliates designated as key state-monitored enterprises have implemented real-time disclosure of pollutant online monitoring data.

However, some platforms still exhibit shortcomings: coverage has not yet been extended to key enterprises designated for monitoring at the provincial and city levels; data disclosure is not always timely and the update frequency is poor; and the pollution information published on the platforms is often incomplete. Even though the Measures on Self-Monitoring and Information Disclosure for Key State-Monitored Enterprises (Trial) has been in effect for over two years, data for nearly 10% of companies has yet to be disclosed, and deficiencies in the disclosed monitoring data restrict the use of such data.

2 . Environmental risks related to pollutant discharge from publicly-listed companies exist in the vast majority of industries

Thanks to the development of online monitoring technology and legal requirements, the vast majority of industries' polluting companies have already started publishing real-time monitoring data. The annual index of tracked companies covers a wide range of industries – 25 in total– with the highest number of publicly-listed enterprises belonging to the chemical, public utilities, and non-ferrous metals industries.

Of the companies that were indexed due to their emissions exceeding legal limits, only 40% received punishments or fines from EPBs. Real-time publication and continuous tracking of online monitoring data can serve as a powerful complement to supervisory monitoring, and can be a helpful tool for public participation and supervision and EPBs' law enforcement. At present, some areas have already begun trial implementation of online data as a basis for law enforcement.

3 . The current strength of environmental punishments is still not enough to convert environmental risk into financial risk

Since the implementation of the new Environmental Protection Law and a series of accompanying measures on January 1, 2015, companies that are found to be in violation of environmental regulations can be subjected to daily fines and other new punitive measures. These new measures can be a powerful means of exposing and punishing environmental transgressions and greatly improving corporate environmental performance.

However, some companies still ignore environmental penalties and continue to pollute beyond the mandated emissions standards, since the cost of penalties remains too low and enforcement methods have still not arrived at a satisfactory level. Last year, China Petroleum Jilin Petrochemical Subsidiary Company was subjected to 5 instances of daily fines for its air emissions exceeding standards, with the fines totaling over 3,870,000 RMB. However, throughout the year, the company repeatedly exceeded emissions and was placed on the index. The passing time has not yet led to rectification. According to China Petroleum's 2015 3rd Quarter Report, the company had a net profit of 30,598,000,000 RMB

4 . Many publicly-listed companies and their affiliates that exceed emissions standards lack the motivation to communicate

During the monitoring period, a total of 28 companies responded to their placement on the index. While many of them achieved compliance, an even greater number of companies still did not explain the cause of their emissions violating standards or their intended corrective measures. This situation illustrates that publicly-listed corporations still attach too low of an importance to online

monitoring of their emissions, and that companies' interest in actively communicating this information to the public is insufficient

According to the analysis, this phenomenon can be attributed in part to the relatively weak limitations of laws and regulations. It is also partly due to the lack of an effective daily tracking and evaluation system for the environmental performance of publicly-listed companies.

(2) Recommendations

1. To ensure fairness, rapidly promote online data disclosure in regions that lag behind

At present, over 90% of publicly-listed companies and their affiliates designated as key monitored enterprises have published online monitoring results. However, the status of online data publication varies across provinces, and at present, provinces with higher levels of information disclosure have more companies placed on the index. From the perspective of fairness of law enforcement, non-disclosing companies may escape punishment, which is profoundly unfair to companies that do disclose. In order to accurately and reasonably estimate the influence of companies' environmental risk, comprehensive disclosure from key state-monitored enterprises must be pushed, and disclosure should expand to self-monitoring information for key monitored enterprises designated for supervision at the provincial and municipal levels.

2. Investors should attach importance to the extensiveness of environmental risks from pollutant emissions

The annual index tracks a wide range of industries, covering a total of 25 distinct industry classifications. Key monitored publicly-listed companies and their affiliates whose emissions exceeded standards during the monitoring period belong to 17 of those total industries, of which the top three industries were chemicals, public utilities and building materials. The main focus of this research was on the compliance status of air emissions and wastewater discharge with standards. Apart from examining key industries traditionally targeted for air pollution prevention, such as the steel, cement, power and glassmaking industries, the air emissions and wastewater discharge compliance situation of the chemicals industry is also worthy of attention.

3 . Improve the effectiveness of disclosing information on environmental penalties and the completeness of information about corrective actions

Large fines, limiting and suspending production, and other such punitive measures will have an important effect on the operations and production of enterprises that receive such punishments, but the publication of information on environmental violations generally lags behind the initial infraction by several months. Disclosure of corresponding corrective actions by companies is also

completely insufficient and unsatisfactory. Therefore, EPBs urgently need to promote the disclosure level of these two types of information. Sufficient and timely disclosure of information on penalties will positively contribute to companies' own market assessments and investor choice, and will help investors to determine the environmental risk of publicly-listed companies. At the same time, various regions' comprehensive and timely disclosure of environmental penalty information and follow-up rectification results can prompt companies to improve their environmental conduct, thus reflecting the level of companies' environmental management, to help achieve emissions compliance as well as promote the company's own corporate image, and improve the ability of enterprises to respond to environmental risk.

4 . Key monitored publicly-listed companies and their affiliates should strengthen awareness of their responsibility toward effective and truthful disclosure of online data

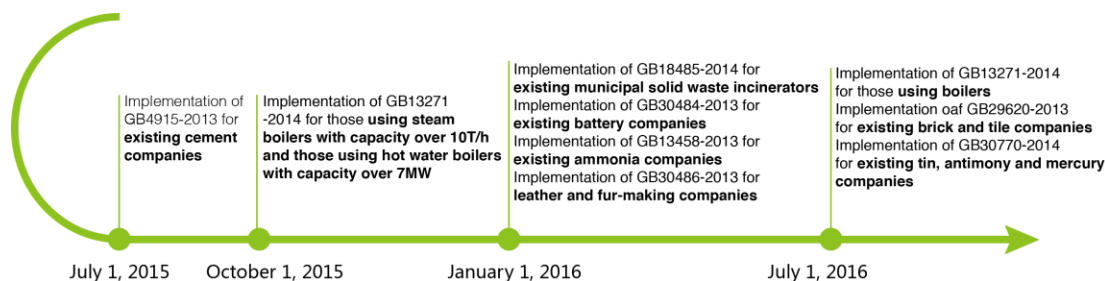
When communicating with different parties during the monitoring period, we witnessed the phenomenon of "passing the buck" between some companies and EPB departments, as well as between publicly-listed companies and their subordinates. According to Article 24 of China's Air Law, key polluting units shall install and utilize air pollution automatic monitoring equipment, connect them to the monitoring equipment network of the department responsible for environmental protection, and ensure regular operation of the monitoring equipment and lawful disclosure of emissions information, thus clarifying that the enterprise is the primary responsible party for ensuring the effectiveness and truthfulness of online disclosure. In accordance with provisions in Article 100 of the same law, for key polluting entities that do not disclose or do not truthfully disclose automatic monitoring data, the departments responsible for environmental protection of people's governments at the county level or higher shall order such entities to make corrections, and impose a fine of greater than 20,000 RMB but no more than 200,000 RMB. Refusal to enact corrective actions will result in an order to halt production.

5. Combine strict enforcement with economic strategies to allow responsible public corporations to win out the market

Light enforcement – such as small fines for big corporations or deep investment streams and protection of enterprises by local governments – makes it difficult to have a substantial impact and covers the truth that an enterprise has a high degree of environmental risk. When breaking the law is more cost efficient than making necessary environmental rectifications, this leads to a situation where "bad money drives out the good" and allows risk to accumulate over time, especially in high-polluting industries. Meanwhile, SMEs face the pressure of the daunting costs of making environmental renovations, so blindly fining companies can force small- and medium-sized enterprises into a financial predicament, and will not help to stimulate the vitality of the market.

We recommend that EPBs combine the use of law enforcement with economic means by following up on rectifications and using a complementary set of economic measures to encourage corrective actions, thereby genuinely helping enterprises improve the current situation.

Appendix 1: 2016 Implementation Timeline of Key Wastewater, Air Emissions and Sewage Policies Relevant for Publicly-listed Companies



Appendix 2: Explanation of research methods for online pollutant data index of publicly-listed companies

(1) Research Scope

Research is based on those publicly-listed companies' branch companies, subsidiaries, controlled affiliates, and key joint ventures identified up through companies 2015 semi-annual reports.

(2) Data Sources

Various provincial and municipal enterprise self-monitoring platforms.

(3) Research Period

December 29, 2014 through December 29, 2015

(4) Calculation Methods

Environmental Risk Index = $50 \times (\text{Number of days exceeding emissions standards})/7 + 50 \times (\text{when the average excess emissions multiplier is greater than 2, use 2; wastewater is calculated based on an excess emissions multiplier of 1.5 as the standard; in all other situations use the daily average multiplier of excess emissions to calculate})/(2, \text{ or } 1.5 \text{ for wastewater emissions})$.

Of these:

Excess emissions multiplier = $(\text{pollutant concentration value})/(\text{pollutant concentration standards}) \times 100\% - 1$.

Average excess emissions multiplier = $(\sum \text{daily average excess emissions multiplier for a certain})$

pollutant from a certain discharge point from that enterprise)/(∑ number of days of pollutant emissions of a certain pollutant from a certain discharge point at the enterprise exceeding standards).

The number of days exceeding emissions standards is counted based on the actual work situation: if, on a production day for that enterprise, any pollutant for any discharge point exhibits 3 or more instances of exceeding discharge standards, and that day's average excess emissions multiplier >0, it is denoted as a day for which that enterprise's discharge points exceeded standards.

Excess emissions are based on whether or not the pollutant concentration value is shown in environmental protection departments' real-time online monitoring data exceeds the standard concentration value for that pollutant, and is defined based on the time period during which pollutant emissions were in excess of standards.

(5) Disclaimer

1. The enterprise discharge standards for this index derive from the enterprise self-monitoring online platforms of environmental protection departments, and the authoring institutions will not be held responsible for any consequences resulting from the authenticity or accuracy of the original data or information.
2. Due to some enterprises' air emissions and wastewater discharge points not indicating standard limit values, or errors in the standard limit values indicated, the authoring institutions consulted the following references in order to revise the relevant discharge standards for air emissions and wastewater discharge points:
 - (1) Enterprise self-monitoring plans;
 - (2) Enterprise self-monitoring annual reports;
 - (3) National and local discharge standards for the industry to which the enterprise belongs;
 - (4) Enterprises' construction project environmental impact assessment (EIA) reports;
 - (5) Local environmental protection bureau quarterly supervisory monitoring reports;
 - (6) 2013 National List of Coal-Fired Units for Mandated Operation of Desulfurization Equipment;
 - (7) 2014 National List of Coal-Fired Units for Mandated Operation of Desulfurization Equipment;
 - (8) According to available introductions for enterprises' boiler operation year, type of boiler, etc.