

1                                   **From Pollution Fee to Environmental Protection Tax:**

2                                   **The Potential and Limitations of the New Environmental Tax in China**

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9                                   **Abstract:** *Environmental Protection Tax Law of the People's Republic of China* is  
10 newly promulgated, aggressively on the way to better green incentives. The proposed policy  
11 is evaluated as part of the country's layering orientation, where the gradual reform is  
12 considered an effective and durable strategy. The new law expands and upgrades the  
13 application of the polluter pays principle embedded in China's present pollution fee system,  
14 so that this "fee to tax" reform is expected to significantly improve environmental  
15 performance. With "income neutrality", the new law may also contribute to a broader tax  
16 green reform. The "Fee to tax" reform reflect the gradualism nature of this policy  
17 evolution, which successfully complete the reform relatively quickly. "Fee to tax"  
18 enhance the legal basis and guarantee, which may strengthen the enforcement and improve  
19 the collection rate of pollution tax. However, it is the most important for a layering process  
20 to evaluate and learn so as to remedy defects in existing regulations. China's existing

21 pollution fee system suffers from low collection rate and inappropriate pricing levels, but  
22 these fundamental problems of pollution tax have not been solved. The exemption of major  
23 pollution sources from agriculture and wastewater treatment substantially reduced regulating  
24 range of the new law. The neglect of VOCs as a whole, results in complicated contract to  
25 VOCs charge policy. Inefficient tax rate might offer little incentive for pollution reduction.  
26 The interagency interface between the tax and environmental authorities is inexplicit. The  
27 attribution and utilization mechanism of tax revenue is still unknown. An effective tax on a  
28 full range of polluting activities is a critical layer in China's steady efforts to eliminate the  
29 adverse environmental effect related to rapid economic growth. Additional improvements  
30 are obviously important before the new law is enacted.

31 **Keywords:** environmental protection tax; gradual reform; layering; pollution fee;  
32 economic incentive; impact

### 33 **1. Introduction**

34 Environmental protection tax (EPT) is one of the most popular topics on environmental  
35 economic policy in China in the past ten years. During the product-life-cycle of "Resource  
36 Exploitation → Production (including emissions) → Consumption", discharging plays the  
37 most direct role of environmental externality, which is the exact lacking of environmental  
38 taxation in China. However, China is currently at a crucial stage of pollution reduction, with  
39 sixteen of the world's most twenty polluted cities, almost half of the world's deaths caused by  
40 ambient air pollution, half of rivers classified as "unsafe for human consumption" (World

41 Bank, 2007). Although China has done a great effort on the pollution reducing target for over  
42 ten years, with thousands of factories being closed or moved, discharging standards becoming  
43 more and more stringent, it still faced a big challenge of pollution driven by a population  
44 growth, urbanization and economic development. These situations contributed to the urgent  
45 needs of emission tax policy, and Chinese Government needed economic incentives for  
46 effective environmental protection.

47 At the same time, China's fiscal and tax system reform actually promote the  
48 development of environmental tax system in recent ten years. China's environmental  
49 taxation reform started along with the new round of taxation reform in 2004, paying attention  
50 to optimization of resources allocation and "transfer the reasonable fees which is suitable for  
51 taxation forms to taxes" (CPC Party Central Committee, 2003). Pollution fee is exactly  
52 suitable for taxation. After 10-year efforts, in 2015, China released a new proposed statute:  
53 *The Environmental Protection Tax Law of the People's Republic of China (Exposure Draft)*  
54 (hereinafter referred to as *Exposure Draft Law*), and asking for public comments. It is a  
55 very important progress in Chinese reform for fee clearance and tax legislation. Subsequently,  
56 *the Environmental Protection Tax Law of the People's Republic of China* (hereinafter referred  
57 to as *New Law*) was approved on December 25, 2016, with the principle of unchanged tax  
58 incidence and only focusing on emission tax.

59 Someone may argue that there is little difference of *the New Law* and the pollution fees  
60 policies in China, and it is less significant to carry out this transfer. In fact, this is a typical

61 gradual process of institutional change, which is achieved through a marginal adjustment  
62 rather than an essential subversion.

63

64 Historic evaluations of public policy design suggest that shifts in the substantive  
65 orientation of policies are a process of “gradualism” rather than the cataclysmic reform  
66 “shock therapy” (Rocco, P. and C. Thurston. 2014). Although there some debates between  
67 proponents of shock therapy (Sachs *et al.*, 1994) and gradualism (Mckinnon, 1994), North  
68 (1990) believes that institutional change mainly in a gradual way, with a marginal adjustment  
69 of the rules, norms and implementation in an institutional framework, basically continuously,  
70 gradually and stably.

71 Thelen (2003) put forward two modes to analyze gradualism: layering and conversion.  
72 Mahoney and Thelen (2010) argued “layering”, meaning “introduction of new rules on top of  
73 or alongside existing ones”, is a better and more steady way for addressing critical social  
74 challenges than external shocks that change the rules and system radically. The transition of  
75 China's pollution fee to EPT is exactly a layering mode. The *New Law* offering an addition  
76 “layer” to the considerable network of pollution fees, and will be the milestone of the tax  
77 system greening and help gradually achieving the ideal reform dividends of environmental  
78 protection and distortion elimination.

79 The buffering of transaction costs can maintain or force the institution to evolve in a  
80 gradual manner. The institution may also be persistent without best suitable arrangements,  
81 because the expected return might exceed the cost of changing (Shepsle, 1989). Daugbjerg

82 and Swinbank (2015) argued layering is more attractive for its effectiveness of  
83 implementation. It is good for reducing the reforming cost, especially in the short term. In  
84 addition, layering policy-making will be more acceptable, because stakeholders may be easier  
85 and more comfortable converted to the new layered policies, and furthermore without  
86 challenges to the legitimacy of existing institutions and leaders.

87 The continuity of layering legislation may provide a learning curve from existing policies  
88 for policy designers and makers, so that they can revised the policies framework more  
89 targeted. However, gradual reform is not equal to forward but may be backward. Davis  
90 and North (2008) believe that it is necessary to prevent backlash from the actors' volition and  
91 preferences. Daugbjerg and Svendsen (2003) argue that environmental taxes will not be  
92 successful unless they are able to diffuse anticipated industry opposition, and legislative  
93 layering may make it simpler, especially in some countries where central government may not  
94 be as influential as China.

95 This article gives a detailed case analysis of China's reform from pollution fee to  
96 environmental tax, which is a typical case gradually layering reform. Comparing the fee and  
97 tax policies, the research expounds the gradual layering phenomenon by analyzing the  
98 substantive changed and unchanged provisions. Basing on the learning curve of redesigned  
99 pollution fee policies, what potential benefits should be expected and what further amending  
100 should be done in the intending reform.

## 101 2. An Evolution from Pollution Fee to Environmental Protection Tax in China

102 Within China's environmental economic field, pollution charge system has the longest  
103 implemented history, while EPT has been one of the hottest and most controversial topics in  
104 recent decade. Along with the promulgating of the *Draft Law*, these two parallel policy lines  
105 converged in 2015 (Figure 1).

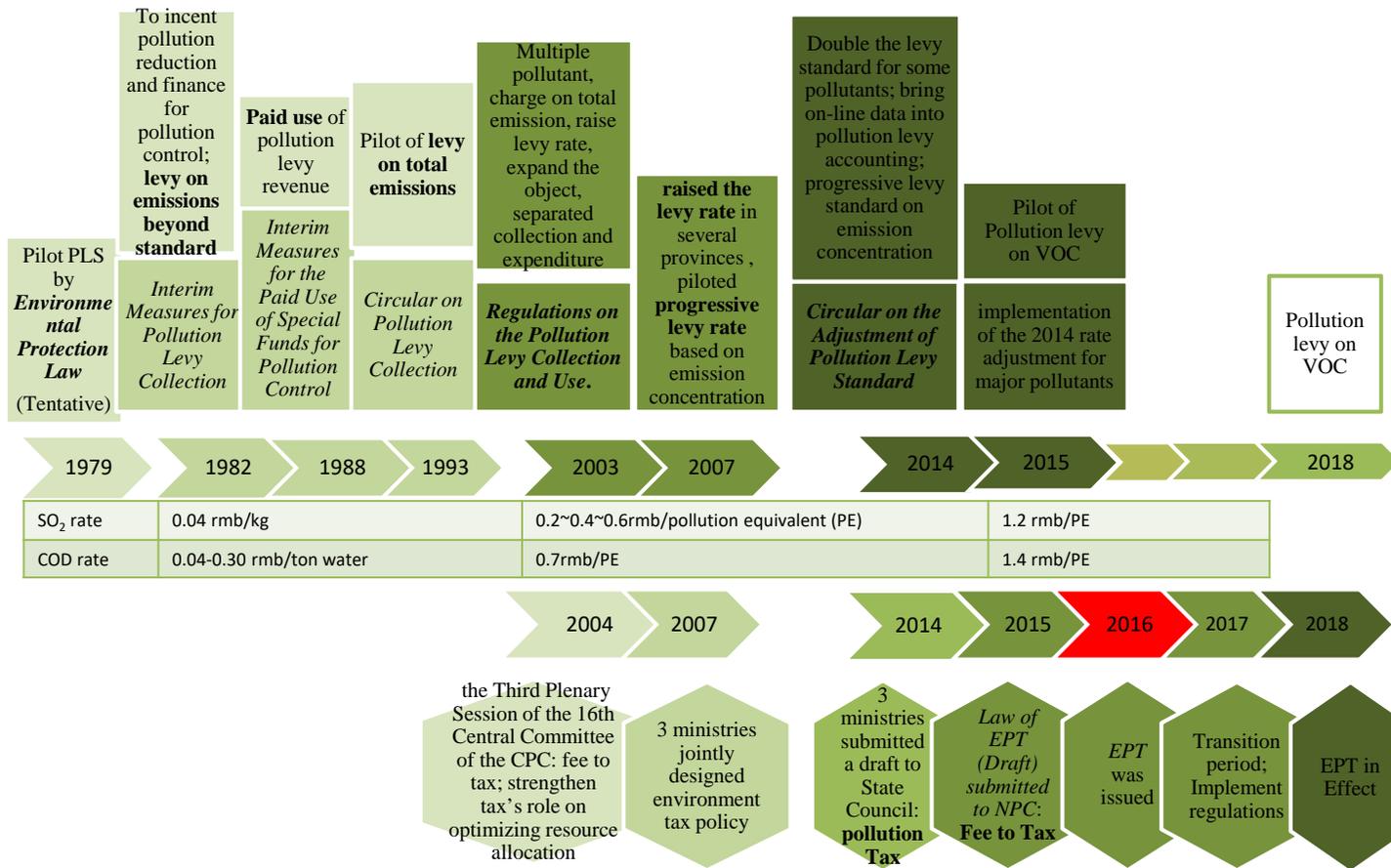


Figure 1 An Evolution from Pollution Fee to Environmental Protection Tax in China

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107

## 108 **2.1 The Embryo of China's Pollution Charge System**

109 After pilot projects in late 1970s, China formally levied pollution fee in 1982 with the  
110 context dealing with the inflexibility of command-and-control instrument and the insufficient  
111 budget and funds for environmental governance and enforcement in China (PRC State  
112 Council, 1982).

113 At this stage, two layering process happened: (1) the taxpayers. In 1982 only pollution  
114 discharged beyond standards was charged, but in 1993, China firstly charged the wastewater  
115 with the idea of the total emission control (Ministry of Finance (MOF), the State  
116 Development Planning Commission, 1993); (2) the utilization of charge revenue. Originally,  
117 collected pollution fee was used for free to subsidize the pollution controlling. In 1988, free  
118 subsidization was replaced by a loan from a special fund out of pollution fee with interest  
119 (PRC State Council, 1988), further implementing "polluter pays principle". For many years,  
120 earmarking the pollution fee made sure a very important source of funding for pollution  
121 control in China.

## 122 **2.2 China's Pollution Charge System Gradually Formalized**

123 With two decades experience, in 2003, China formalized its pollution charge system  
124 (Chinese State Council, 2003). This is one of the most important reform of China's  
125 pollution fee: changed levy items from single pollutant to multi-pollutants, replaced levy base  
126 of concentration by total emission, raised fee rates (Figure 1), doubled the fee rates if  
127 effluents exceeded the standards. More than this, the fee payers was expanded from

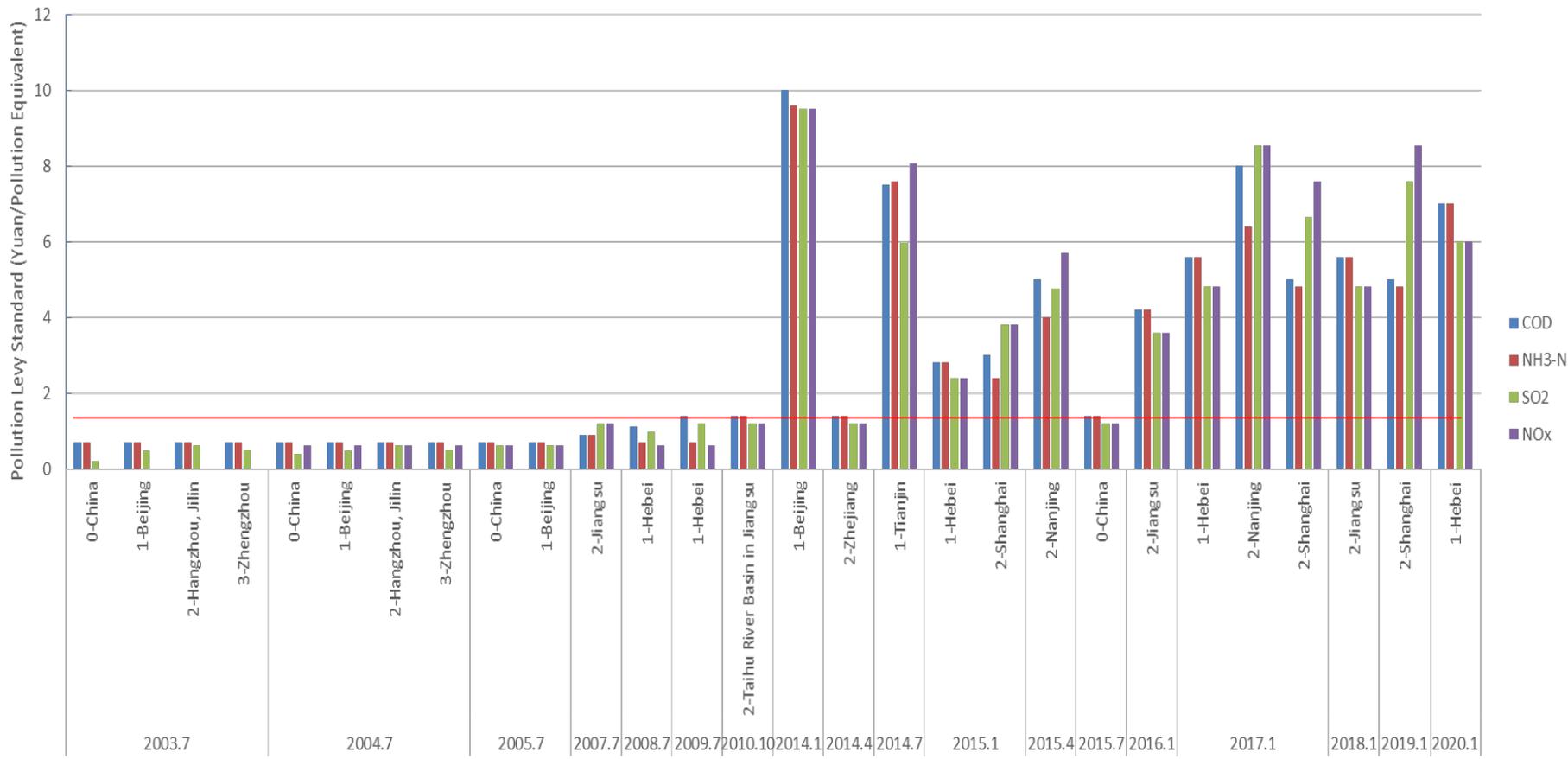
128 enterprises and institutions to all industrial and commercial individual households, and  
129 increased the penalties. These provisions enhanced and enlarged the effectiveness of  
130 pollution charge system. Furthermore, it regulated the pollution fee by separating revenue  
131 and expenditure, fitting into budgetary outlays and the special fund of environmental  
132 protection, to control rent-seeking risk.

133 Although being raised in 2003, the pollution fee rate was criticized for being too low to  
134 incentive emission reduction. From 2007 on, a number of local governments increased their  
135 fee rate to varied levels (Figure 2) and charging differently according to different  
136 concentrations of emissions.

137 In 2014, China promoted its pollution charge system again to nationally double the fee  
138 rates on the four targeted pollutants in pollution reduction governance and five heavy metal  
139 pollutants before the end of June 2015 (National Development and Reform Commission,  
140 2014). In addition, the differential fee rates were applied according to the different  
141 discharge levels for more effective incentives. This policy signal went so far as to simulated  
142 several local governments to upgrade fee rates sharply, especially in two important regions of  
143 Jing-Jin-Ji<sup>①</sup> region and the Yangtze River delta (Figure 2).

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<sup>①</sup> Beijing (Jing); Tianjin (Jin); Heibei (Ji).



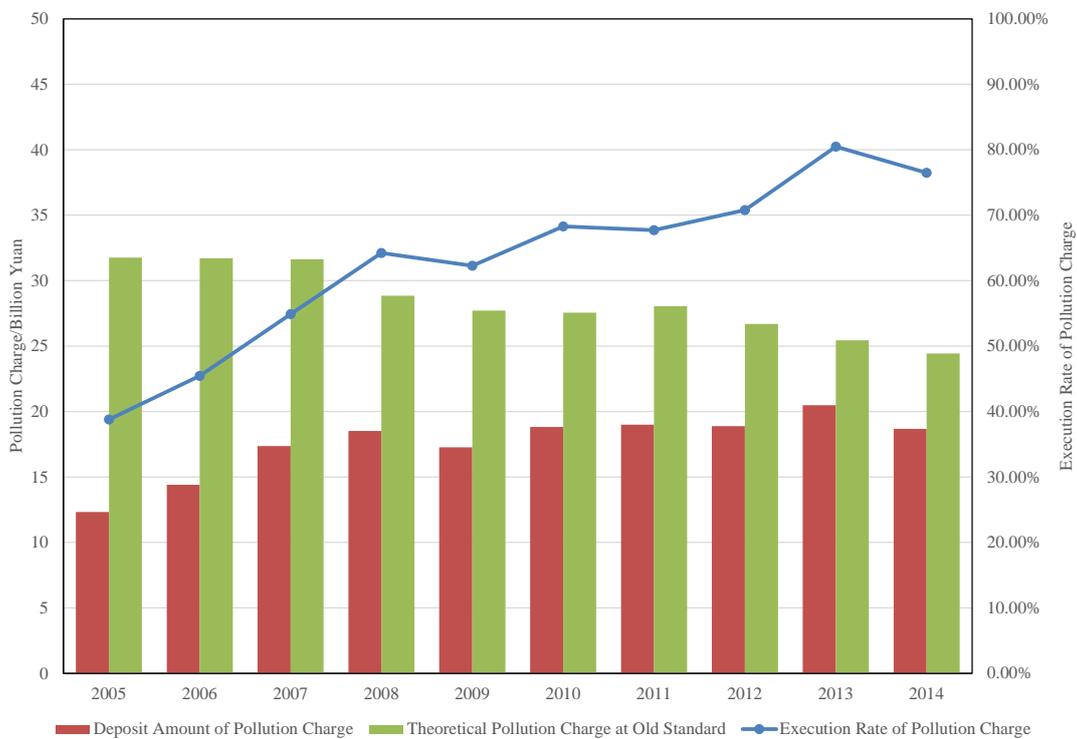
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145 (It is incomplete statistics according to local policy documents. 0-National wide; 1-Jing-Jin-Ji region; 2- the Yangtze River delta; 3-others)

146

**Figure 2 The Change of Pollution Fee Rate in China**

147 Promoting the pollution charge system gradually by policies layering, there are  
 148 nevertheless some crucial problems to be address in China: (a) The fee rates are still not high  
 149 enough to compete with the pollution abatement cost; (b) the emission measurement for  
 150 pollution fee accounting is poor of accuracy; (c) the enforcement and execution rate is poor as  
 151 negotiation on payment is allowed (Figure3); and (d) the policy does not covered all pollution  
 152 activities, exempting many important pollution sources.



153

154 (Data Source: National Environmental Statistics Bulletin from 2005 to 2014)

155

Figure 3 Execution Rate of Pollution Charge in China

## 156 **2.3 China's Reform from Pollution Charge to Environmental Protection Tax**

### 157 **2.3.1 The Naissance of the Environmental Protection Tax Law of PRC**

158 To solve the imperfections in the pollution charge system mentioned above, stakeholders  
159 and academician increasingly called for a more comprehensive “green tax” system.

160 Since 2007, three related Administrations jointly designed EPT policy of China. From  
161 the international perspective, many countries introduced environmental taxes originally only  
162 for the purpose of environmental protection (OECD, 2011). However, the motivation of  
163 environmental tax has recently quietly converted to be an important and maybe necessary part  
164 of a broader reform of the taxation system. There is no doubt that China is on a similar way to  
165 the reform, including taxation legalization and structural adjustments, so that it offers a good  
166 opportunity to expand the tax framework to cover the whole product-life-cycle to solve the  
167 negative externality, including resource tax, consumption tax and emissions tax. While the  
168 first two types of environmental taxes are promoted very fast, tax on emissions is absent,  
169 which may provide direct incentive for pollution control (Andersen *et al*, 2000). This might  
170 be a serious problem as China is exactly at a crucial stage of pollution control. Pollution  
171 charge system has already contributed to incentives for emission reduction. What China  
172 needs is a new environmental tax system fully considering the existing pollution fee system.

173 In order to confirm the force of the planning EPT Law, it need to be enacted by the  
174 *National People's Congress (NPC)* or its *Standing Committee*, the supreme organ of state  
175 power in China. Following the legislation process, after the application and extensive  
176 preparatory work, deliberations and compromise among the important stakeholders, in

177 November 2014, a draft law for EPT was submitted with the essence of "pollution tax" (Jia,  
178 2014). Then the *Exposure Draft Law* was publicized on June 10, 2015, making it open for  
179 comments from experts and public. After revision and approval, the bill was presented to the  
180 *NPC Standing Committee* at the end of 2015, and it formally entered the legislative  
181 examination process.

182 The *NPC Standing Committee* had the first review in September, 2016 and publicized  
183 the *Environmental Tax Law (Draft)* (hereinafter referred to as *Draft Law*) for public  
184 comments again. Then after the second review in December, 2016 and made further revision,  
185 *the New Law* was formally passed by voting of the *NPC Standing Committee* and  
186 promulgated on December 25, 2016, and will be enacted in January 1st, 2018.

187 Looking into the evolvement from pollution fee policies to *Exposure Draft Law*, *Draft*  
188 *Law*, then to *New Law*, some continuous and steady idea distributes in the provisions of  
189 taxpayers, tax items, tax bases, tax rates, accounting (monitoring), collection (declaration),  
190 revenue utilization, power-benefit division and local enforcement authority, and improved  
191 adjustment for reforming gradually exists at the same time. The *New Law* can be  
192 summarized that while tax rate will keep unchanged to make sure the overall tax burden  
193 converted smoothly, some provisions are designed to enhance the levy stringency and positive  
194 incentives and are also improved on normalization.

### 195 **2.3.2 Changed Provisions**

196 Although the keynote of this fee-to-tax reform is steady shift, *the New Law* is upgraded  
197 by some specific design.

198       **Firstly**, the enforcement rigidity will be enhanced not only because of the original force  
199 of the legislation, but also basing on some specific design as the followed seven points.

200       a) Taxpayers

201       The pollution fee system charges the *urban waste water* centralized treatment facilities  
202 exceeding the discharge standards of several pollutants. The *New Law* expands the scope of  
203 “charge on exceeding” from *urban* to *urban, town and village*, not only *wastewater* but also  
204 *household garbage* centralized treatment facilities, from *several pollutants* to *all listed*  
205 *pollutants*.

206       b) Tax Items

207       Besides of the top 3 conventional air/water pollutants, the tax items are extended from  
208 five listed heavy metal pollutants to top 5 of the first class pollutants which will accumulate in  
209 the environment or inside plants and animals, mostly heavy metals. The human health gets  
210 more and more attention. Furthermore, provincial governments are authorized to expand the  
211 pollutants list and require additional pollutants to be taxed. The fugitive air pollutants  
212 emission behavior will be taxed. It is conducive to strengthen the regulation of volatile  
213 organic compounds (VOCs) emission which has already been major pollutants in Southern  
214 China and contributed much to PM2.5 all over China.

215       c) Tax Rate

216       Although the pollution fee rates newly upgraded to the current level before June 2015,  
217 they only cover 4 major air/water pollutants and 5 heavy metals. The *New Law* expands  
218 these base rates to all listed water and air pollutants.

219 d) Tax Accounting

220 Priority of the automatic monitoring data on fee/tax accounting is gradually promoted  
221 and other accounting data sources are conditionally restricted. It is good for increasing  
222 monitoring frequency so as to improve total emission accounting accuracy.

223 e) Collection Modes

224 The *New Law* clearly defines the tax accounting and collecting frequency while pollution  
225 fee not. Specially, the *New Law* does not mention tax relief and delay, may lessen  
226 negotiation on the tax collecting amount and enhance the execution and enforcement.

227 f) Tax Declaration

228 Taxpayers are commonly required to declare tax amount quarterly. The *New Law* puts  
229 forward more rigorous regulation on declaration, requiring additional declaration of discharge  
230 concentration.

231 g) Penalties

232 Comparing to the *Exposure Draft Law*, the *New Law* deletes the “serious loss”  
233 precondition of penalties on illegal emission. No matter what consequences were, the illegal  
234 behaviors would be punished according to laws on taxation and environmental protection, so  
235 that the authority and force of the *New Law* are enhanced.

236 **Secondly**, the positive incentive provision designs are as follows: 1) the *New Law*  
237 additionally emphasizes the exemption of solid waste comprehensive utilization behavior,  
238 encouraging recycling; 2) more grades of discounted rates may also be applicable to  
239 encourage meaningful pollution reduction.

240           **Thirdly**, the normalization represents in two aspects. 1) For tax rates, the *New Law*  
241 delete the double tax rates on illegal emission, strictly distinguishing the different natures  
242 between legal emissions suitable for tax and illegal behaviors must to be punished; 2) For  
243 local enforcement authority: the tax rate discounts and accounting/declaring frequency are  
244 clearly defined and unified; the provisions of relief are deleted; tax rate discretion is limited  
245 within ten times and designated legislative level. These rules decrease the arbitrariness  
246 within taxation decisions, controlling local protectionism and rent-seeking behaviors.

247           **Fourthly**, the *New Law* introduces a new institutional arrangement for tax collection. In  
248 the new framework, the procedures rely heavily on self-reporting by polluters. Unlike the  
249 Environmental Protection Bureau (EPB) in charge of almost everything in pollution fee  
250 system, the required data are submitted to the Tax Bureau for by polluters, while the emission  
251 monitoring is supervised by EPB. The detailed discharge inventory and data is shared  
252 between tax and environment authorities.

253           **Finally**, revenue utilization is deleted in the *New Law*. The revenue from pollution  
254 charge is earmarked for environmental protection by being put in the special fund. *Exposure*  
255 *Draft Law* proposed to replace earmarking by bringing into the unified fiscal budget, while  
256 the *New Law* deletes this term. However, it is a key point and should be regulated in some  
257 policy.

### 258 3. The Expected Impact of the Environmental Protection Tax Law in China

259 As previously discussed, the *New Law* appears to be a gradual layer and the reform will  
260 steadily move forwards. The existing defects in implementation of China's pollution charge  
261 policy can be expected to partly correct, but partly continuing.

262 Theoretically, the principle and effect of fees and taxes are consistent. Is it worth and  
263 cost-efficient to pay such a lot in nearly copying pollution fee to EPT? We argue that, from  
264 the macro-view, the *New Law* is ultimately a big step in the process of the legislation of  
265 taxation and reform of China's green fiscal system, from micro-view, a medium step in  
266 enhancing the Pigouvian pricing on pollution, but regrettably a small step in achieving  
267 substantial emission reductions.

#### 268 3.1.1 To Make the Taxation and Fiscal System Green

269 A "green" tax system should adjust the tax structure, producing sufficient revenues to  
270 support financial consolidation with other existing taxes cut or reduced. EPT reform is a  
271 usual way for tax and fiscal greening. Many developed countries have realized legalization  
272 of their environmental fees. This is undoubtedly a progress on the normalization of the fee  
273 system. Environmental taxes have long been argued that they can realize "double  
274 dividends", both incentivizing socially desirable behaviors and producing alternative tax  
275 sources and fiscal revenues by adjusting the utilization of incomes and the overall tax  
276 structure. China is rightly in an integrated societal strategy, the introduction of pollution fee  
277 into the mainstream taxation can be considered as an important step.

278 **3.1.2 To Improve Enforcement Rigidity and Collection Rate**

279 Basing on nature force of legislation, the *New Law* is supposed to improve the  
280 implementation performance and increase the collection rate.

281 Low collection rate of pollution fee is often considered to be an important reasons for  
282 insufficient incentive on emission reduction behavior. Interviewing some local EPBs, many  
283 times they charged the enterprises on a fixed quota of pollution fee according to how much  
284 they are assigned to collect or how much they believe a polluter can afford, without  
285 considering the actual emissions. The arbitrariness and excessive discretion during pollution  
286 fee policy execution limited the collection rate improvement and disturbed the regulatory  
287 signals. According to our analysis with the major pollutants emission data in 2014 and the  
288 pollution fee rates applied since 2003<sup>®</sup>, the pollution fee collection rate in China was low as  
289 76%. Considering other pollutants should be charged, the actual collection rate would be  
290 lower. Therefore, even with the new fee rate in 2014 or tax rate, the revenue would be no  
291 more than 37.7 billion RMB. It is estimated that after establishing a new EPT, the legal  
292 basis and institutional authorities available for collection will be strengthened. With 2014  
293 emission data, the total amount of environment tax could reach 49.3 billion RMB. Improved  
294 collection rates will undoubtedly increase the impact of the economic incentives, constitute a  
295 more fair policy and facilitate far more effective environmental management.

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<sup>®</sup>In 2014 and before, most of China is still applying the old pollution fee rate set in 2003, which is only 50% of the basic tax rate in *the New Law*.

### 296 **3.1.3 To Set the Tax Rates Effective for Pollution Reductions**

297 Although the New Law can enhance the collection of EPT, it is possible failing to  
298 facilitate emission reduction, if the tax rates cannot be increased according to environmental  
299 outcomes.

300 The theoretical basis of environmental tax is the Pigou-tax principle in the competitive  
301 market, with tax rate basing on the external cost of pollution which is practically difficult to  
302 accurately measured. Therefore, Baumol and Oates (1971) proposed a standards-pricing  
303 approach: the tax rate is adjusted according to the emission standards by considering the  
304 projected marginal cost of pollution abatement. This is the usual way for emissions tax/fee  
305 rate decision in most of the countries, then the regulated polluters will decide whether to  
306 reduce emission by comparing its tax and abatement cost. Qin *et al.* (2015) shows that the  
307 higher environmental tax rate can significantly reduce emissions, while the decline in GDP  
308 within the affordable range. The *New Law* is expected to be a good opportunity to raise the  
309 environmental tax rate higher than the abatement costs for higher effectiveness.

## 310 **4. Problems to Be Solved in the Environmental Protection Tax Policy**

311 The typical layering reform of “fee to tax” is helpful for steady and easy implemented,  
312 but many problems are left to be solved, or the aforementioned expected benefits of *the New*  
313 *Law* may not be realized. Although layering is good for reducing the short term  
314 implementation cost, repeated reforms may make the final cost of the overall reform too large  
315 (Fan, 1993).

316 **4.1 Incomplete Tax Items**

317 The scope of tax items in the *New Law* is too small and not extensible without the  
318 possibility to add VOCs or carbon tax, which are very likely to be taxed in the future. VOCs  
319 may be particularly urgent to be thought about because its pilot.

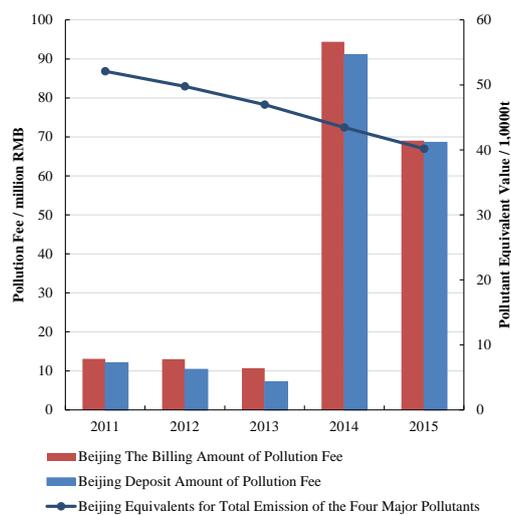
320 We argue that the decision makers will face the policy integration at the following four  
321 points in the very near future referring to VOCs pilot system and some taxed VOCs in the  
322 *New Law*: a) The species of VOCs related to the pilot charge system are much more than  
323 those in the *New Law*. b) The pilot charge system treats VOCs as a whole (TVOC), while  
324 the *New Law* accounts the listed VOCs individually with their respective PEs. c) In some  
325 industries, the pilot charge system account emissions by converting from inputs which is not  
326 applied in the *New Law*. d) VOCs are charged synchronously but nonredundant in the  
327 pollution fee system and the pilot system. Since 2018, we have to complete this complex  
328 connection between taxed VOCs and charged TVOC, or to amend the relevant part in the  
329 *New Law*.

330 **4.2 Inefficient Tax Rates**

331 As the above analysis, the tax rates for pollutants in the *New Law* should base on  
332 pollution abatement costs. The problem is that the *New Law* only adopts *existing* pollution  
333 fee rates, which have been approved to be far below the marginal abatement cost. More than  
334 this, the *New Law* does not set a tax rates upgrading plan or provide an approach to amend the  
335 tax rates. Although the *New Law* allows upgrade by provincial jurisdiction, these relatively  
336 low rates will limit the effectiveness of the new legislation. Many industries are not

337 expected to really response for the tax and reduce emission. The study by Qin *et al.* (2015)  
 338 show that with the new tax rate, emissions of the four major pollutants are only likely to  
 339 decrease slightly. The researches on the pollutant treatment cost shows that the *New Law*  
 340 tax rates is too conservative. For example, the average abatement costs of COD, ammonia  
 341 nitrogen, SO<sub>2</sub> and NO<sub>x</sub> for the industries of Shanxi Province in 2012 were about 1.25 to 4.75  
 342 times of the new tax rates, far from promoting the further pollution control(Wu and Chen,  
 343 2015).

344 Qin *et al.* (2015) assessed a range of tax rate scenarios and concluded that any associated  
 345 decline in GDP due to environmental taxes was within an acceptable scale. Therefore, it is  
 346 reasonable to increase the tax rate to a higher level. It is also useful for maintaining the EPT  
 347 revenue scale against the atrophy caused by regressive emission during environmental  
 348 management advancing. For example, Beijing raised the fee rates upto 15 times since 2014.  
 349 Although the four major pollutants emissions decreased sharply, the pollution fee income of  
 350 Beijing still enlarged 5 to 9 times (Figure 4).



351

352 Figure 4 The Interaction of Pollution Fee Rate Adjustment and Emission Reduction on  
353 Pollution Fee Revenue in Beijing  
354

355 There are discounted rates in the *New Law* for excellent pollution control. However, it  
356 loosen the condition to only depend on the effluent concentration. It might be a backward  
357 step in promotion of total emissions.

358 Given that the objective of the *New Law* is to provide incentive for pollution abatement,  
359 some researches indicate that a differentiated tax rate system should be applied practically  
360 (He, 2016; Wu and Chen, 2015), fully considering differences in abatement costs among  
361 disparate industries as well as regional distinctions. Appropriately, the *New Law* authorizes  
362 considerable autonomy to provinces to increase tax rates no more than ten times. However,  
363 whether the range is reasonable has not been approved. For some area such as Beijing, its  
364 pollution fee rate has been already close to the ceiling, so the 10 times limit might be  
365 challenged soon. Another concern is that regional differential tax rate creates a risk that  
366 some regions will choose to “race to the bottom” and offer lower tax rates, creating “pollution  
367 havens”. Since 2015, significant different fee rates for the major pollutants have emerged  
368 within Jing-Jin-Ji Area (Figure 2), a close geographical range. This has aroused anxiety.  
369 Few studies answer whether 10 times is suitable to avoid the transfer of pollution and the  
370 externality from regional environment deterioration.

371 In addition, differential tax rates for disparate industries should be considered, which the  
372 *New Law* does not mention. Researches consistently confirmed the significant differences in  
373 abatement costs among different industries (Wang and Wei, 2014; Davies and Mazurek, 1996;

374 Russel, Harrington and Vaughn, 1986). This phenomenon emerged from our survey  
375 regarding four important industries in a case city in north China (Pang and Wu, 2014). The  
376 study clearly confirmed cross-industry discrepancies in the operating costs of pollution  
377 control. With the tax rate in *New Law*, some industries might prefer to reduce pollution for  
378 its cost is lower than the expenditure taxes, while some industries might not. Therefore,  
379 unified tax rate across industries cannot guarantee all important pollution sources industries  
380 control their pollution as anticipated.

### 381 **4.3 Excessive Taxpayer Exemptions**

382 Beyond some negotiation deals, the excessive taxpayer exemption causes low coverage  
383 of potential taxpayers in the *New Law*, almost completely copying the exemption from the  
384 pollution fee system, excluding agricultural pollution, motor vehicles, conventional industrial  
385 solid wastes and urban sewage treatment plants among the pollution sources subject to the  
386 new tax. The *New Law* excessively considers the current management and governance  
387 capacity on tax collection, lack of forward-looking.

388 Agricultural pollution and motor vehicles are typically small, dispersed sources of  
389 pollution which constitute a considerable regulatory challenge. But their aggregate  
390 contribution to degraded environmental conditions is among the most significant. Agricultural  
391 discharges contributed 43.7% COD, 57.2% total Nitrogen and 67.4% total Phosphorus in  
392 2007 (Rao, Xu and Ji, 2011). Vehicles emissions from were identified as one of the most  
393 important pollutant sources in China's big cities.

394 The urban sewage treatment plants concern not only domestic wastewater sources with  
395 37.8% COD and 57.5% ammonia nitrogen released in China in 2013 (Wu and Chen, 2015),  
396 but also large amount of indirect discharging enterprises. According to our calculations, the  
397 *New Law* only taxes 13.5% COD and 10% ammonia nitrogen overall discharges of China.  
398 However, pollution concentrations of the strictest sewage treatment plants discharge standard  
399 in China are still far higher than permissible surface water standards. Therefore, the indirect  
400 dischargers pay *treatment* fees to the treatment plants, but do not pay *emission* tax for its huge  
401 amount of taxed pollutants actually discharging into natural water through the centralized  
402 treatment plants. This creates an inherent inequity that neither the punitive effects, nor the  
403 positive incentives of an EPT are passed on to industrial pollution sources through the price  
404 chain.

405 Practically, to solve the above excessive exemptions, some methods and international  
406 experience can be followed to replace of exemption or permanent concessions. There are  
407 successful cases on dealing with the difficult environmental performance monitoring of  
408 farmers and vehicles, especially with indirect taxes (e.g., tariffs on inputs). Many countries  
409 have introduced taxes to reduce demand for fertilizers and pesticides and their emissions  
410 (Institute for Self-Reliance, 2009).

411 Wastewater treatment plants are a “classic” point source that is easily taxed according to  
412 any parameters. International experience with taxation of sewage goes back almost 50 years  
413 (Ecotec, 2001). For the wastewater treatment plants, we can set the tax transition or suspend  
414 temporarily, but should eventually combine EPT and the sewage treatment fee collection

415 systems to form a price chain of "EPT-wastewater treatment fee", transferring the real  
416 pollution reduction cost to the real polluters.

#### 417 **4.4 Indistinct Collection and Management Responsibility**

418 The *New Law* intends to further enhance the enforcement rigidity by clearly defined  
419 some details besides of the original force of a law, but at present, innovations appear to be  
420 largely absent.

421 Under the *New Law*, if the Tax Authority believes that information declared by taxpayers  
422 is inaccurate, it may submit a request to the relevant environmental protection agency to  
423 verify the actual emission. But the Tax authority's capacity for evaluating applications and  
424 tax payments based on the reported and shared data is doubtful. For an environmental tax  
425 law to be effective, it needs to specify that professionals from the environmental protection  
426 ministry are responsible for verifying the veracity of applications and payments. This  
427 requires very high skill of collaboration between the Tax and Environment authorities. In  
428 order to support the collaboration, the smooth contacting between *Environmental Protection*  
429 *Law* and *Tax Administration Law* is necessary, avoiding conflict of these two laws resulting in  
430 twice penalty for once illegal declaring. If these important responsibilities are not clearly  
431 defined, polluters will play ministries off against each other and seek a path of least  
432 resistance.

#### 433 **4.5 Undefined Attribution and Utilization of the Tax Revenue**

434 The *New Law* contains no provisions designating any attribution and special use for the  
435 funds generated by the EPT.

436 For better balancing the conflict between their governance and property rights, and  
437 helping to resolve funding needs in the cross-regional environmental problems with some  
438 gathering revenue by the central government, it is recommended to share the tax revenue  
439 between the central and the local government (Li and Yin, 2016; He, 2016).

440 However, the EPT is not expected to bring substantial contribution to the revenue scale.  
441 It is estimated that the country's industrial emissions in 2014 can raise funds only about 50  
442 billion RMB from of EPT, and might become less and less with the regressive characteristics  
443 of emission tax caused by the emission reduction. This revenue is a huge drop in the  
444 demand for environmental protection and governance funds, so that the earmark cannot meet  
445 the developing environmental investment need. According to the nature of taxes, all new tax  
446 revenues will be part of the Chinese government's general income and are subject to general  
447 budget priorities. Therefore, it is suitable to introduce the tax revenue into the unified fiscal  
448 budget, to ensure the input of environmental protection through the appropriate mechanism  
449 with diversified capital sources, finally to establish a green fiscal expenditure structure.

## 450 **5. Conclusions**

451 Pollution levels in China remain extremely high and environmental exposures constitute  
452 the country's paramount public health priority. It can be argued that without initial efforts  
453 through pollution fees, it would not have been possible to move forward to the next level of  
454 regulation. Adopting a new Pigouvian initiative can lay a foundation for future adjustment  
455 of China's tax structure and overall tax system reform. That's why it is important to "get it  
456 right". In evaluating the virtues and shortcomings of China's *New Law*, we reach several

457 conclusions that should be considered as part of the environmental tax reform currently under  
458 debate:

459       Firstly, China stands to benefit from a new environmental tax. By shifting from “taxes  
460 on good activities” to “taxes on bad activities”, the new statute upgrades and leverages three  
461 decades of incipient efforts to bring the polluter pays principle to corporate and individual  
462 decisions. China’s pollution control policies continue to be driven largely by  
463 command-control / engineering measures. As regulations grow more strenuous, this  
464 approach has already led to increased spending in environmental protection by polluters. To  
465 survive from proliferation of mandatory rules and regulations along with the existing  
466 pollution fee system, the reform of environmental taxation should be promoted as  
467 expeditiously as possible.

468       Secondly, China needs to establish an environmental taxation system that fully integrates  
469 existing programs that levy pollution fees. The new, integrated system should systematically  
470 consider the full gamut of polluters including the major pollution sources from agriculture and  
471 wastewater treatment in China.

472       Thirdly, environmental taxes need to be promoted within the context of a broader,  
473 structural tax reform. The *New Law* constitutes a precious historical opportunity for  
474 fundamental tax reform.

475       Finally, the Chinese layering strategy makes sense in a country that has a moral  
476 responsibility to address pervasive poverty through robust, economic expansion but that at the  
477 same time needs to come to terms with the enormous consequences in terms of public health  
478 and pollution. A gradual process should not be synonymous with complacency. On its

479 steady road to improvement, China must maintain clear sense of where it needs to be going  
480 environmentally. Notwithstanding the aforementioned imperfections, the newly proposed  
481 legislation and its transition from a “pollution fee to environmental tax” is a critical new level  
482 that will strengthen the legal basis for economic incentives as a key tool in China’s  
483 environmental protection. A series of problems in the present *New Law*, however, remain  
484 unsolved. China should try to make its economic policy instruments even more effective.

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