NIMBYism, Waste Incineration, and Environmental Governance in China

Journal:	*China Information*
Manuscript ID	CIN-19-0030.R5
Manuscript Type:	Article
Keywords:	NIMBYism, waste incineration, environmental governance, China, regulation
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Abstract: With the world's largest population and rapid urbanization, China is in the throes of a waste management crisis. Efforts to cope with this crisis through waste incineration have been met with growing NIMBYism as the Chinese public become more environmentally aware and are determined to protect their health and economic interests. We review the turn to incineration and the major characteristics of NIMBYism and ensuing protests against waste incinerators. We then describe the May 2014 Jiufeng incinerator protest in Hangzhou and the subsequent efforts to successfully respond to NIMBYist protests and build the proposed incineration plant on the planned site. The Hangzhou Jiufeng case offers a model for breaking the logjam between development and NIMBYism, leading to important improvements in environmental governance and regulation.

Keywords: NIMBY, waste incineration, environmental governance, Hangzhou Jiufeng, YIMBY, environmental protests

As many Chinese cities seek to expand waste disposal facilities to cope with the increasing amount of waste, they must overcome growing public concerns and rising NIMBYism. The struggle of residents against waste disposal projects highlights both the strengths and weaknesses of Chinese environmental governance and of China's political economy. Based on our fieldwork and case monitoring beginning in 2014, we examine China's expansion of waste incineration and the accompanying challenges of NIMBYism. We suggest that the difficulties and eventual

success in constructing the Jiufeng waste incinerator in Hangzhou mark a milestone in the relationship between the state and NIMBYism and carry broader implications for waste management and the transformation of environmental governance in China.

We first provide a brief background on China's waste management crisis and the current state of Chinese waste incineration. We follow with a quick review of the theoretical framework behind the rise of NIMBY (not-in-my-backyard) activities and delineate the relationship between the state and NIMBYism in China, giving special attention to the major factors that have stimulated strong NIMBY opposition to waste incineration projects. We then focus on the milestone reached by Hangzhou's Jiufeng incinerator project and illustrate how, through the interaction of local authorities, NIMBY protesters, industry, media, and national regulatory authorities, the resolution of Jiufeng went beyond placating immediate NIMBY demands and set an example for improving environmental governance concerning waste incineration. In consequence, the experiences of Jiufeng and other projects have informed the development of national standards for emissions from waste incineration. The article concludes with a summary and argues that, in the Jiufeng and other cases, NIMBYism does not equate with parochialism and has helped to stimulate improvements in environmental governance in China.

Waste incineration, the rise of NIMBYism, and the state

With rapid urbanization, over one-third of China's 600-plus cities face serious waste disposal challenges.[1] The rapid municipal solid waste (MSW) growth rate can be attributed to the rise in economic prosperity and consumerism. Meanwhile, China's waste disposal capacity has not kept up with the growing amount of trash produced. As recent as the early 2000s, China's waste management plans were still primarily focused on increasing the percentage of MSW disposed through sanitary and regulated landfills and on curtailing illegal dump sites. In 2005, only 37 per cent of MSW was disposed of cleanly and of those properly disposed, over 70 per cent was by landfill.[2]

Caught between the rising amount of MSW and the growing difficulty of obtaining land for new landfills, the Chinese central government and municipal authorities increasingly regard waste incineration as an attractive solution for coping with the waste management crisis. Waste incineration is perceived as a more modern and environmental way of treating MSW given its

successful deployment in many developed countries. Through incineration, the volume of MSW can be reduced by 80 to 95 per cent, decreasing the need for landfills.[3] Waste incineration plants can be located closer to city where the MSW is produced, thus reducing the cost of transporting waste to landfills. When employing the best technology available, incinerators through stack emission can be odour free, minimizing potential negative impact on quality of life.[4] In the 13th Five-Year Plan (2016-2020), the central government raised the target incineration rate to 60 per cent for coastal cities and 50 per cent nationwide.[5]

The same growth in economic prosperity that is a major cause of the waste management crisis has also brought on increasing NIMBYism and thus helped spawn a challenge for Chinese authorities used to top–down solutions. We note that unpopular waste treatment projects are often not voluntary in nature because inaction would lead literally to trash piling up and result in potentially greater negative externalities for an urban area at large. It is in this light that we must consider the positions and actions of the government and NIMBY actors who resist waste management projects such as landfills and waste incineration projects.

We follow Kristy Michaud in underscoring the fact that NIMBYism is distinct from environmentalism. NIMBY actors are motivated by self-interest and tend to oppose specific local projects rather than all projects of a similar nature.[6] Michael Clary and Bruce Kraft define the 'backyard' in the NIMBY concept as a contained geographic location where individuals believe that they reside close enough to an unfavourable project such that they would be personally affected by it.[7] Moreover Clary and Kraft see NIMBYism as arising from a combination of parochial and localized views, lack of information, distrust of those in charge, general risk aversion, and emotional reactions.[8] In contrast, Ian Welsh considers the implication of 'backyard' in NIMBY as a physical location problematic and argues that it is not the physical space and proximity that unite the opposition but the complex ties between location and identity.[9]

The NIMBY issue can be parsed into the strategic interactions between residents and the forces and interests behind the protested project. Barry Rabe and John Gilroy interpret NIMBYism as a form of the prisoner's dilemma game and the dominant strategy is for each member to 'defect from the provision of collective good'.[10] For the residents engaging in NIMBYism, the best outcome is 'unilateral defection' where the residents stop the project and the developers withdraw. Because potential 'hosts' are expected to not cooperate with unpopular

projects, Rabe and Gilroy conclude that the rational policy approach would be to delay public knowledge of unpopular projects. [11]

From an economic perspective, Ronald Coase concludes that NIMBYism leads to an inefficient allocation of resources because of the market's failure in handling negative externality.[12] In order to overcome the lack of a socially optimal outcome arising from the prisoner's dilemma model, the NIMBY problem can also be considered by using the assurance game. Under this model, the best outcome is 'universal cooperation' where the end goal is the collective rather than individual welfare: citizens overcome their fear of negative externalities arising from the proposed project because they trust that the government is a moral agent representing the collective interest.[13]

In addition to the above considerations, a government seeking to moderate NIMBY reactions should also consider the underlying preferences of residents. According to Peter Groothuis and Gail Miller, the major options for individuals facing a NIMBY situation are either 'tolerance' (passive inaction) or 'avoidance' (vocal action), with higher-income individuals more likely to decline compensation packages and instead opt for the 'avoidance' route.[14] We recognize, however, that in practice the interactions between residents and project backers may be much more complicated and some residents may mix their strategies as they seek to improve their bargaining outcomes, especially compensation.

NIMBYism and the state in China

We believe these theoretical insights into the dynamics of NIMBYism are also relevant to considerations of developments in China, especially the growing number of protests against waste incineration projects. With rising economic prosperity, NIMBY activities have increased in China because individuals have also become more aware of potential health risks and seek to ward off health risks and protect their property values. Li Zhang et al. estimate that living within 1 km of waste transfer stations in Shanghai is correlated with a decline of 3.8 per cent in property value.[15] Xiaojie Zhang et al. find through a panel study that the number of environmental complaints is positively correlated with increasing GDP per capita and education level.[16]

Within China's hard authoritarian political framework, the parties on opposing sides of projects operate with extra sensitivity to the broader political context. On the one hand,

authorities have developed a variety of tactics for managing and defusing protests, including NIMBY protests.[17] On the other hand, NIMBY actors take care to avoid being seen as challenging the state and are focused on securing improved terms of assistance and compensation for highly localized issues.[18]

In this context, the national environmental regulator, a bureaucratic latecomer in its various guises has shown a willingness to work with environmental NGOs and other actors as potential allies for environmental protection. Together they have promoted gradual improvements in oversight and compliance with existing regulations by the local government. In general, as Thomas Johnson concludes, the rise of NIMBY movements in China has put pressure on the government to enforce and follow existing legislations on the review and approval of projects with potential environmental impact.[19]

Local authorities in China have adopted diverse strategies to cope with growing NIMBYism. However within a culture of top–down decision-making and limited time horizons, Sarah Eaton and Genia Kostka find that local officials intent on getting projects completed have tended to consider engagement and public involvement as time-consuming, excessively cumbersome, and inefficient.[20] Studying the project cycles of Liulitun, Gaoantun, and Sujiatuo incinerators in Beijing, Johnson finds that local governments in the face of NIMBYism are more likely to avoid confrontation by decreasing transparency or by relocating projects to poorer areas with less informed residents.[21] The efforts to decrease transparency are in line with what Rabe and Gillroy have predicted.

Yet, the reduced transparency is all too often accompanied by tactics of deception and manipulation and coupled with strong-arm measures leaning on a complex system of stability maintenance.[22] These tactics often worked. However, in this age of digital information, such tactics can only sow the seeds of distrust and provoke resistance. In a comparative study of NIMBY protests against the construction of waste transfer stations in Shanghai and Hong Kong, Sun Linlin et al. find that while both local governments did not seek public participation, the use of deception and manipulation in Shanghai increased the public's negative perception of the project and distrust of government representatives. As a result, the deceptive tactics fuelled the momentum of the NIMBY drive and undermined the government's ability to engage in constructive dialogue with NIMBY activists later in the project cycle.[23]

Indeed, suspicion and distrust of local authorities have prompted NIMBY protesters to dig in and push harder against local authorities. NIMBY actions have succeeded in forcing local authorities to postpone or cancel the construction of high profile PX (paraxylene) projects as well as waste incineration plants in Beijing, Guangzhou, and Wujiang, among others.[24]

Over time, some local leaders have drawn lessons from their interactions with NIMBY activists and the experiences of others. Yanwen Li et al. find that the Panyu protest in Guangdong challenged the government to go beyond traditional forms of tension reduction and to engage in collaborative governance.[25] Natalie Wong attributes the evolution toward broader participation in Panyu to the more open political structure and historically high rate of social activism in Guangdong.[26] As a result, Johnson concludes that pressure from populist environmental mobilization that started as NIMBYist helped to midwife broader changes in environmental governance in favour of more public input and participation.[27]

Sources of strong NIMBY opposition to waste incineration projects

We should underscore that we do not characterize the NIMBY actions against waste incinerators in China to be knee-jerk, emotional responses. Incineration offers many advantages as a waste disposal method. Yet the rapid growth in the number of incineration plants has faced especially strong pushback and mounting protests in China for a variety of reasons that raise public concerns. As noted earlier, local authorities and other project backers tend to be less than forthcoming about the projects. Public distrust is also warranted because regulatory oversight and management of environmental impact tend to fall short of announced standards and even to the wayside as project backers push for quick construction and operation. Such regulatory concerns have been further aggravated by financial considerations. Waste management companies, even when they are state-owned, compete fiercely with each other to win government contracts with low bids and then look for ways to cut costs, sometimes at the expense of environmental compliance. In this section, we summarize the major concerns about incineration projects that have surfaced in China.

The public has strong cause to distrust the enforcement of existing environmental standards. By law, the building of incineration plants is required to go through environment impact assessment (EIA) prior to construction and operation. The EIA process, which is

criticized by many as ineffective, is especially problematic in the case of waste incineration facilities because the authorities are involved both in the building of such facilities and in environmental regulation. While public participation is required for EIAs, scandals have erupted over faked public surveys that showed overwhelming support for the incineration projects. Institutions conducting EIAs for incineration projects are viewed as untrustworthy and are thought to be on the side of municipal governments and corporations.[28] Often excluded from the EIA processes, the public then turn to anti-incineration protests outside of the EIA process.

Individual incineration projects are regulated by local governments and often managed by government-affiliated entities. There thus exists significant potential for conflict of interest because the incineration plants are projects built with the full support of local governments, and there are major shared interests between the government and the incineration plant. As a result, local environmental protection bureaus, operating under the auspices of the local government, are often unwilling and unable to properly monitor and regulate the plants. Should the bureau issue stoppage orders for a heavily polluting incineration plant, the city may face an immediate trash crisis due to the sudden negative shock to its waste disposal capacity.

Moreover, extensive and costly pre- and post-incineration treatments are required for the safe incineration of waste to manage the potentially harmful by-products of incineration. Due to inadequate sorting separating wet and dry waste, incineration plants in China have difficulty burning waste with high moisture content while maintaining a desirable temperature for safe operations and power generation. Meanwhile, post-incineration treatment procedures are crucial to the protection of public safety. For each ton of MSW incinerated, some 30 kg of incinerator fly ash is produced. Fly ash contains high level of carcinogens such as dioxin and requires a costly and cumbersome treatment for safe disposal.[29] Yet there are reports that in practice some provinces with incinerators had no fly ash treatment plants and it was clear that some local regulators, such as the city of Wuhan, tolerated such glaring environmental violations.[30]

Finally, a major source of frustration is the lack of transparency on the part of the local authorities in the process of approving and building new incineration plans. All too often, authorities developing incineration projects are tempted to avoid the public rather than placating public concerns with transparency. The public usually discover incineration construction plans through social networks and the online rumour mill. By taking evasive actions, local authorities tend to lose credibility with the public and thus fuel negative opinions about incineration and

stimulate NIMBY activities. In various cases, the incineration plants are built to operate at high standards and tend to produce low levels of pollutants. Yet due to poor information disclosure, the public tend to assume the worst.[31]

Frustrated by the inadequate information disclosure, NGOs have in recent years stepped in to promote information transparency of incineration facilities and regulators. They initially encountered a bleak landscape. When asked by the China Waste Information Network (backed by Wuhu Eco) in 2013, only 30 of the 122 incineration plants contacted responded with relevant data. Most of those that disclosed information provided incomplete figures. Only 10 plants provided figures for dioxin emission and only two plants provided figures for fly ash management and mercury.[32]

At the time of writing, however, the situation, aided by China's quick adoption of all things digital, has improved significantly. In 2018, the Chinese Waste Information Network reached out to 152 environmental protection bureaus to request information on their regulation of waste incinerators. By June 2018, it had received responses from about 80 per cent of the contacted bureaus, and 74 per cent provided details on the scope of their regulatory work on waste incineration.[33]

The 'Jiufeng Incident': From NIMBYism to collaborative governance

To elucidate the forces at work in waste incinerator-related NIMBY activities, we look at the case of the Jiufeng incinerator protest in Hangzhou (pop. 7 million in 2017), the provincial capital of Zhejiang Province. As we elaborate in the appendix, we began to closely follow the Jiufeng incinerator project and wrote our initial case report in summer 2014, in the context of a larger project on China's environmental governance. We visited waste incineration and other treatment facilities in China in 2014 and subsequent years, and we have tracked the Jiufeng project by using official sources and from personal interviews in Hangzhou and Beijing and by monitoring social media postings and media coverage.

The Jiufeng incinerator project brings together the conflicting forces at play: the local government that is under intense pressure to find a waste management solution, the increasingly sophisticated residents who become NIMBY actors and fight hard to protect their interests against perceived bad governance, and the national regulatory authority which seeks to find a

path forward for developing building incinerators in China. In our assessment, the Jiufeng NIMBY case in Zhejiang is a milestone case because of its location in Hangzhou, where Xi Jinping served as Acting Governor and then Party Secretary in 2002-7. Zhejiang has been a Xi base after he became the paramount national leader; a variety of experiences that originated in Zhejiang have subsequently been promoted as models for emulation. The resolution of the Jiufeng NIMBY case is thus of national significance.

In the 2000s, Hangzhou's MSW growth rate exceeded 10 per cent per year while waste disposal capacity stagnated.[34] To cope with the MSW surge, the Hangzhou Municipal leadership in early 2012 began planning for the construction of a waste incineration and power generation plant at the site of an abandoned quarry mine in Jiufeng Village of Zhongtai Sub-district (pop. 24,244), which is part of Hangzhou's Yuhang District. In November 2013, a company, the Hangzhou Jiufeng Environmental Energy Co. Ltd, was established with the purpose of building and operating an incinerator with a processing capacity of 3,000 tons per day, the largest in Hangzhou. Most local residents in Zhongtai Township, however, would not hear about the proposed incineration plant until April 2014.

On 22 April 2014, the Zhejiang Bureau of Housing and Urban–Rural Construction posted an online notice that it was reviewing the Jiufeng waste incineration and power generation project for approval and solicited public comment. The following day, Transport Radio reported that the Zhejiang Bureau of Environmental Protection had yet to receive the EIA report for the Jiufeng project. It also indicated that news of the proposed project had caused area residents to worry. An environmental volunteer was quoted as saying that the proposed site was close to major water sources and tea plantations and an estimated half a million residents live in surrounding areas.[35]

Worried that their concerns were ignored as had occurred with the Binjiang Incineration Plan in Hangzhou, residents around the Jiufeng Project site rallied to gather more than 20,000 signatures on a petition seeking to halt the Jiufeng project and presented the signatures to the Hangzhou Planning Bureau. The petitioners were given a written reply to expect a response in due time. Meanwhile, the organizers of the April signature drive began a grass-roots education campaign and had over 100 people join them to inform residents within a 12 km radius of the proposed plant about the dangers of incineration pollutants.[36]

In the absence of an official response to the petition, some residents saw surveying equipment being moved to the proposed Jiufeng incinerator site on 8 May. They suspected that preparations were being made to start construction. As word spread by mouth, phone, and social media about this development, hundreds of residents began to gather and protest each day at the proposed project site and the local government office.

Concerned that the peaceful protests might get out of control, the Yuhang District government issued a notice on 10 May that all Jiufeng project activities were to cease and that the incineration project construction would not start without completion of all mandated procedures and public support. It also promised to invite the participation of residents to guarantee their right to information and participation.[37] The notice failed to quell the mass anger and more than 5000 gathered to protest the following day. Protesters blocked traffic, overturned some vehicles, and scuffled with police. A number of the protesters and residents were injured and taken to the local hospital.[38] Even after the 10 May clash, hundreds of villagers continued to gather around the locked-down local government building. Many local cadres were against the incineration project and dozens appeared to have resigned in protest.[39]

The dramatic protests sent a powerful message to the leaders of Yuhang District and the Hangzhou municipal government that the Jiufeng project cannot be carried out without cooperation from project area residents. Jiufeng project area residents resisted the incineration plant not only because the authorities had made little effort to reach out to them as stakeholders in the proposed project. They also distrusted the project promoters and feared the project (even if they had been consulted earlier and because of what they heard about incineration plants in the greater Hangzhou area). When the authorities and incineration project promoters have such a record with local communities, how could residents be expected to trust them?

The Hangzhou leadership now recognized that they had a crisis on their hands. On 11 May, Vice Mayor Xu Liyi promised that construction work on the Jiufeng project had stopped and would not restart without public approval.[40] Only a few days later, as if timed to respond to the Hangzhou development, the Ministry of Environmental Protection together with the quality administration issued updated and tightened guidelines for the construction and operation of waste incinerators.[41]

The Jiufeng Incident attracted national attention. While official media criticized some protesters for causing property damage, they also put blame on the local government for

neglecting the emotions of residents. Central state media launched a series on waste incineration and emphasized that local governments had to ensure better monitoring and public participation.[42] It was clear that the central authorities were keeping an eye on Hangzhou and its leadership as the Jiufeng Incident burst into the limelight.

The Hangzhou leadership reached an impasse. Suspending the project bought the leadership time but not the solution for Hangzhou's growing trash problem. Relocating the project, as had happened in other cities, was also not an easy option because Hangzhou was well developed. As leaders of the provincial capital of Zhejiang, a major political base of Xi, the leaders of Hangzhou, known for pioneering various urban governance reforms, were under enormous pressure not simply to resolve the Jiufeng project issue at hand but also to find a path forward for a growing national issue in environmental governance. An increasing number of waste incinerator projects had run into similar problems. The Jiufeng project was seen as a litmus test.

Clearly recognizing that they faced an uphill struggle in winning cooperation from area residents and that they could not succeed by simply continuing the top–down approach, the Hangzhou leadership, through the Yuhang District leadership, switched to partnering with the local communities while also exerting pressure on key individuals to 'maintain stability'.[43] On the basis of a reading of diverse sources and some interviews, we offer a summary of these partnership outreach efforts here:

1. Seeing is believing: It was not enough to assert that the proposed waste incinerator would be safe. Between July and September 2014, the Yuhang district government and Zhongtai neighbourhood office invited and paid for residents to make visits to existing waste incinerator facilities to see for themselves how such facilities operated and how much impact they had on the environment. To overcome the reluctance of residents, they started with the leaders of 12 villages near the project site. More than 4000 residents (2400 as of Public Notice time) went on 82 such tours. Of the four villages closest to the project site, 80 per cent of the families had at last one member join in these trips.[44] Altogether the visitors toured nearly 60 waste incineration facilities, including Everbright International's operations in Nanjing, Changzhou, Suzhou, Jiangyin, Jinan, and Ningbo. Some of the visitors also went out of their way to meet with residents living the facilities.
   Visitors on these trips learnt about multiple aspects of waste incineration, saw the incinerators in operation, and gained an understanding of the significance of such facilities for cities such as

Hangzhou. Many came back with most of their fears allayed, and some in turn became influencers in the communities that the proposed incinerator would be reasonably clean and safe. The favourable impression many residents had of incinerators built and operated by the Everbright International Group was one factor that swayed Hangzhou to also select Everbright International to build, operate, and manage the Jiufeng project. Representatives from Everbright International became heavily involved in the project subsequently.

2. Offering compensation and benefits: The municipal and district governments pulled out all the stops to support the communities near the project site. The Hangzhou municipal government allocated Zhongtai 1000 *mu* (about 165 acres) in land-use quotas for non-agricultural development. The Yuhang district government earmarked RMB 140 million to improve the environment and infrastructure in Zhongtai: 71 of 117 planned projects were started immediately, including investments in roads, bridges, and street lights in these once isolated villages. It also promised to invest more than RMB 2 billion to help Zhongtai develop leisure/tourism, attract investments, or otherwise create job opportunities for residents.[45] These initiatives helped to allay fears among local community leaders that the incineration project would deter new businesses. Some community leaders saw the Jiufeng project as a welcome opportunity for much-needed development.
3. Partnering with the communities: Over time, the Hangzhou municipal and Yuhang district governments learned to treat the local communities as partners. Following the visits to operating incinerators, a public meeting was convened to provide more details about the Jiufeng project and answer residents' questions on waste storage, incineration, emissions and the control of dioxin, and handling of fly ash.

Going forward, project managers were careful to keep the Jiufeng area residents informed and involved.[46] When a geological and hydro survey was conducted in the latter half of September 2014 for the EIA, area representatives were invited to observe and supervise.[47] Later on, monitoring equipment was set up in the villages so that residents could learn about local environmental quality first-hand. Residents were also invited to join in inspections of the incineration project and efforts were also made to mitigate construction-related pollution.

These efforts paid off. When, on 11 September 2014, the Zhejiang Housing and Urban–Rural Development Bureau again put the public on notice that it was considering for approval the Jiufeng project, the announcement was greeted with calm.[48] Those who were following the

project closely would note the emphasis on adhering to superior emissions standards (Euro 2000), zero water discharges, and fly ash treatment, among others, as well as the fact that the project would now take up less land area (34.4 acres). The EIA was released the following day when the Hangzhou municipal government also convened a press conference to announce the proposed project details. Following surveying and other efforts, the EIA was completed in late November. A survey of the area residents was conducted and it also proved favourable. With all approvals secured, construction started on 14 April 2015 and the plant went soon into commercial operation with little public resistance. To maintain trust, the plant displays live pollutant emission data on an electronic screen visible to the public and has offered tours to the public.[49]

Without intending, the protesters at Jiufeng and other places have become allies of the regulatory state. The Ministry of Environmental Protection had been frustrated by the widespread incidence of corporate non-compliance with emissions standards. At the end of 2016, the Ministry, headed by Minister Chen Jining who had the full backing of President Xi to bolster environmental regulation, issued an industrial emissions compliance action plan. The action plan stipulated that firms in eight sectors, waste incineration among them, must achieve 'obvious results' by the end of 2017.

The Ministry strategy to force compliance from waste incineration enterprises was to demand transparency. Scholars of transparency have noted that the impact of transparency promotion tends to be ineffective and even counterproductive with only limited and partial disclosure.[50] In a display of its growing authority, the Ministry of Environmental Protection pushed for full disclosure and ordered all waste incineration enterprises to install equipment to automatically monitor key emissions and performance indicators, erect screens to disclose data to the public in real time, and to supply such data in real time to the environmental protection system including the Ministry in April 2017.[51] This corporate transparency is coupled with efforts to allow the public to visit the incineration plants so that they can see, hear, and smell for themselves. Simply put, the Ministry wants to use transparency by the waste incineration enterprises to win back public trust and enhance environmental governance of such enterprises.

The Ministry's strategy was partly based on the experiences of projects such as Jiufeng. Even before the Jiufeng incinerator went into commercial operation, Chinese journalists began to cast the Jiufeng incinerator project as a case of successful innovation in social governance to

untie the knot of NIMBYism.[52] Representatives of Everbright International eagerly touted the case as a classic public–private partnership success.[53] In a vote of confidence in how Hangzhou and Everbright turned the Jiufeng project around with improved governance, in July 2017 the Ministry convened in Hangzhou the corporate leaders of more than 40 waste incineration enterprises to boost the transparency initiative.[54] The Jiufeng project, together with two other projects in Jiangsu that were also built and operated by Everbright International, were touted as models for commendation and emulation.[55]

The Jiufeng experiences came in handy in Wuhan in summer 2019. As noted earlier, Wuhan was in the early 2000s known and criticized for the unsatisfactory performance of its waste incineration operations.[56] In June 2019, in a replay of Jiufeng, massive protests broke out in Wuhan's Xinzhou District after local authorities failed to consult and involve residents in the decision to build a new incineration facility in Yangluo near residential neighbourhoods and schools. Faced with the highly publicized protests, the Xinzhou district government suspended the project and promised to seek the public's support before re-starting the project.[57] On the day the project was halted, the district government began to reach out to the local population online and posted basic information regarding the benefits of waste incineration.[58] It also showcased pictures of clean modern incineration facilities, high-tech monitoring equipment, and happy nearby residents, and notably featured the Jiufeng incineration plant.[59] As of the time of this writing, it is not yet clear whether the Yangluo incinerator would go ahead but it is clear that the Xinzhou district leadership has much to learn from the Jiufeng case.

Discussion and conclusion

As many cities in China struggle to cope with landfill capacity limits, they have increasingly turned to waste incineration. Yet the difficulties many cities have encountered in building incineration plants illuminate both the strengths and weaknesses of Chinese environmental governance and of China's political economy.

Municipal leaders in China have tended to rely on top–down and secretive tactics to develop waste incineration plants. Such tactics, however, undermine public distrust and prompt affected residents to engage in NIMBY activities in order to safeguard their health and the value of their property. In the meantime, since local authorities are also under pressure to maintain

social stability, they have found it increasingly challenging to cope with determined NIMBY activists fighting against waste incineration projects.

The case of the Jiufeng incinerator project illustrates well the dynamics of anti-incinerator NIMBYism. The Hangzhou authorities initially failed to include the public and such hubris or sheer ineptitude only served to sow distrust, fuel public anger, and stimulate NIMBY mobilization. The protesters against the Jiufeng project were primarily motivated by the perceived threat to their personal physical and economic well-being. The scope of NIMBY activities against the project, as elsewhere, was thus limited and parochial. The NIMBY activities forced the local authorities and the involved enterprise to dramatically adjust their behaviour through public engagement, increased transparency, and economic compensation. As a result, public sentiment was turned, and the Jiufeng project was completed. The significance of the Jiufeng turnaround is far from parochial, and it offers a major example of collaborative governance between government, enterprise, and the local community. By broadening public participation, enhancing transparency, and sharing both costs and benefits, the Jiufeng success turned a case of NIMBY veto into one of YIMBY (yes-in-my-backyard) development.

Leveraging on the experiences of Jiufeng and other projects, the Ministry of Environmental Protection was able to demand that waste incineration enterprises meet stringent requirements of transparency in complying with national standards for industrial emissions. As a result, NIMBYistic demands and more broadly local communities as stakeholders have played an important role in improving environmental standards and environmental governance. NIMBY parochialism has thus contributed to the making of civic good.

Faced with growing NIMBYism against the building of landfills and incinerators, waste management has figured prominently on the national agenda. In 2018, the Chinese government banned the import of waste. President Xi has personally and repeatedly stressed the importance of systematic garbage sorting and the central government has set ambitious waste sorting targets for Chinese cities to achieve by 2025.[60] In response, the city of Shanghai has led the nation by adopting strict garbage sorting guidelines in the summer of 2019, with emphasis on the separation of dry and wet waste, a crucial step in ensuring safe incineration and thus reducing the amount of waste going to landfill.[61]

Appendix: Note on field research and interviews

We began this research as part of a larger project on China's environmental governance in 2014. We were initially concerned with the broad issue of NIMBYism and waste disposal and conducted interviews with leading environmental NGOs (especially in Beijing and Guangzhou) and activists knowledgeable about developments in Beijing and Panyu and elsewhere, academic researchers in think tanks and universities such as Renmin University of China, China University of Political Science and Law, Beijing, Sun Yat-sen University and Tsinghua University, and journalists. We also spoke with regulators in the Ministry of Environmental Protection and visited a provincial environmental protection bureau.

We especially benefited from a site visit to Beijing's Gaoantun incinerator in the summer of 2014. The guided tour there helped us understand the as-of-then 'best case scenario' for waste incineration in China since that incinerator was used as a model for publicity. In the process, we began to learn and write about the Jiufeng protests in Hangzhou. Subsequent to 2014, we have continued to monitor the relevant developments at Hangzhou and elsewhere. One of the authors also made visits to Hangzhou and conducted interviews with individuals with knowledge of the Hangzhou situation. We have also made extensive use of public sources, including media reports and online comments/blogs. We are grateful to our interviewees, who shall remain anonymous, for their insights into general environmental issues and for helping to inform us of developments in waste incineration. Our interpretation of the public sources and of public events is shaped by the discussions we have had with our interviewees.

Notes

We are grateful to two anonymous reviewers for their suggestions. Xiaodu Huang gratefully acknowledges support from the University of Chicago Metcalf Internship Program in 2014. Any opinions and views represented in this article are those of the authors and do not represent those of the institutions or organizations the authors are associated with in their professional or personal capacities.

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