# Allocation of Environmental Targets in China: Neither Fair nor Efficient

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**Abstract**: This paper analyses how China's authoritarian regime uses environmental targets as an enforcement mechanism. Based on document analysis and fieldwork, it examines how binding environmental targets are allocated on different levels of China's administrative hierarchy. The evidence shows that, despite the recognized benefits of allocating differentiated targets in accordance with scientifically weighted equity and efficiency criteria, China's bureaucrats have persisted in allocating targets in a discretionary and opaque manner. We argue that this situation results from capacity constraints on the part of the planners, as well as the intrusion of politics in the target setting and implementation processes. These structural defects of the target system affect the legitimacy of environmental planning and incentivize disgruntled local officials either to resort to drastic, costly and unfair measures to satisfy upper-level demands or to shirk responsibility and fake performance data despite increased monitoring and verification.

**Keywords**: Environmental policy targets; target allocation; China; command and control policy instruments; fairness

## Introduction

The world is carefully watching China's strategy of using administrative measures to implement a domestic response to the global challenge of climate change. Since 2007, this response has centred on binding energy intensity and carbon intensity targets allocated and implemented throughout the administrative hierarchy from the national to the provincial, municipal, county and township levels. However, the challenges are immense and include the vast income gap between have- and have-not provinces. Chinese provinces not only differ in terms of population density, GDP per capita, industrial structure and technological capabilities but also vary widely with regard to their energy consumption and energy structure (Da et al. 2013). Moreover, intra-provincial disparities are high and rising (Yu, 2014).

Given these disparities and the difficulties many localities face in meeting the uniform targets imposed by the 11$^{th}$ FYP (2006–2011), the adoption of the 12$^{th}$ FYP in 2011 spurred a political and academic debate about the necessity of designing domestic climate policies that would be both more equitable and more efficient. Academics contributed to this debate by proposing diverse scientific methodologies, including a mix of economic, industrial and energy indicators, to distribute national energy and carbon intensity targets more equitably and cost-effectively among China's provinces (e.g. Ohshita, Price, and Tian, 2011; Li et al. 2014; Zhou et al., 2014).

Notwithstanding these efforts, we still know little about how Chinese bureaucrats have distributed environmental targets since 2006. A few qualitative studies suggest that central planners have considered the domestic implications of the "common but differentiated responsibilities" principle. However, they also highlight the distribution process's approximative and opaque nature (Wang, 2013; Ni et al. 2015). Even less is known about the target distribution process below the provincial level, although the lower

levels of governments are in charge of implementing environmental and energy saving projects.

This paper begins to fill this research gap by examining how energy intensity and carbon intensity targets are distributed lower on the Chinese administrative hierarchy. The analysis draws on data collected from policy documents and local interviews. Firstly, information about energy intensity and carbon intensity targets was gathered from government policy documents and reports issued at the central, provincial, municipal and county level to uncover how targets trickle down from the national level to the county and town levels. Secondly, 58 semi-structured interviews were conducted in 2012 in three municipalities located in three different provinces: Chenzhou municipality in Hunan province, Yancheng municipality in Jiangsu province and Weifang municipality in Shandong province. The goal was to analyse the decision-making process shaping target distribution. In each of the three municipalities, officials in municipal bureaucracies in charge of China's environmental targets were interviewed first, followed by interviews with county-and-district level officials. We also conducted two additional interviews in Shandong and Jiangsu in 2019.

We find that China's target allocation system has mobilized political (rather than scientific) considerations. Most often, Chinese bureaucrats have distributed either uniform or hardly differentiated environmental targets, irrespective of the jurisdictions' distinct economic structures. Capacity constraints and political factors seem to be the main causes for the absence of a scientific target allocation method at the local level. As a result, the target allocation process lacks both equity and efficiency and, consequently, long-term sustainability.

## Academic debates over environmental targets as key command and control instrument in low-carbon transitions

### *The nature of Chinese environmental targets*

Despite criticisms of command and control environmental policy instruments, both Western democracies and China have used policy targets as environmental and climate policy instruments. However, the nature and the implementation mechanism of these targets differ significantly in China. In Western countries, environmental policy targets are usually adopted as binding regulations or laws engaging the legal responsibility of national governments (sometimes local in federal governments). However, unlike the police and public health sectors since the 1980s (Frayer et al., 2009, Vand Dooren et al., 2010), environmental administrations have generally not been subject to performance evaluations regarding the fulfilment of these targets.

By contrast, performance evaluation has been central to the implementation of environmental policy targets in China. Since the 2000s, they have included China's Five-Year-Plans (FYPs) and been implemented via the 'target responsibility system' (TRS), a pre-existing core institution of the Chinese Party-state. Under the TRS, the performance of officials striving to meet policy targets like GDP growth has been evaluated annually by superiors with varying degrees of stringency since the 1980s. For hard and "veto" (*yipiao foujue*) targets, repeated non-implementation may be penalized by collective and individual economic sanctions, fewer career opportunities and, potentially, outright expulsion from office (Landry, Lü, and Duan, 2018). Importantly, these sanctions are politico-administrative and individualized rather than legal and public. A growing literature has reviewed the effectiveness of these environmental targets in achieving outcomes such as pollution reduction. For example, Schreifels et al. (2012) studied the effect of targets on air quality, Golding (2011) on water quality, Kostka and Hobbs (2012)

on energy intensity reduction and Santalco (2012) on hydro-, wind and solar power deployment. Wang (2013) and Kostka (2016) also discussed the merits and drawbacks of relying on a target-based implementation approach more generally.

***Academic debates over target allocation***

Another stream of research has developed scientific methodologies for allocating carbon or energy intensity targets across provinces and is increasingly focused on their distributive impact (e.g. Oshita and Price 2011, Zhou et al., 2014; Ni et al., 2015). Fundamentally, environmental targets can be distributed either uniformly or in a differentiated manner. While easier and faster, the uniform approach is also likely to result in unfair and inefficient outcomes (Field, 1994). Differentiated targets introduce variations stemming from the pursuit of other political goals, such as social equity and economic efficiency. Researchers also argue that a scientific allocation method based on equity principles can help secure implementation by subordinate agents and, therefore, help achieve sustainable outcomes. They identify institutional capacity as a key challenge, since obtaining the information required to differentiate targets scientifically is costly and agreeing on a scientific allocation method is politically difficult and time-consuming (Field, 1994).

Recent studies have emphasised the need for China to adopt differentiated targets reflecting inter-provincial and intra-provincial variations. Yi et al. (2011) proposed an "equity-based" allocation model quantifying different provinces' historical carbon emissions and reduction potential based on a mix of indicators (per capita GDP, historical $CO_2$ emissions and energy consumption per unit of industrial added value). Wei et al. (2012) and Guo et al. (2019) have developed models that further refine the calculation of the $CO_2$ abatement potential and cost in different provinces.

However, likely because of the difficulty in gathering data, such studies are much rarer at lower levels. And yet, distributional issues are no less important there, since targets are allocated among localities with widening economic and structural differences (Yu 2014). In 2018, the Shandong province relocated 4,000 chemical plants to rural-designated industrial zones, which significantly altered emissions patterns in the province (Yicai, 2018). Likewise, large municipalities often encompass both rural and urban districts and counties, with significant variations in energy saving and emission reduction potentials among them. From a policy point of view, it is worth examining the pertinence of using environmental targets at this local level in the first place. But once in place, they have an impact on local development strategies and raise significant fairness and efficiency issues.

While these studies have made significant contributions to ongoing theoretical debates about target allocation, they have neither examined nor explained current allocation practices. Wang's (2013) study was one of the first in English to describe how environmental targets were integrated into the TRS in the 11$^{th}$ FYP. A more recent study by Ni et al. (2015) proposed a method to deduce the central government's allocation preferences for provincial energy intensity targets to provinces in 12$^{th}$ FYP. The authors do so by comparing the distributed targets with a series of provincial characteristics (energy intensity, environmental sensitivity, GDP per capita etc.). However, their analysis focuses on the national level and takes for granted that the government followed a scientific allocation method but excludes political considerations and bargains.

By contrast, this paper examines the political process of target allocation and pays more attention to the sub-provincial level. In so doing, it emphasizes that any reform aimed at rationalizing target allocation has to take institutional and political implementation constraints into account.

**Environmental target allocation practices in China**

Since 2006, the majority of binding environmental targets adopted by Chinese central planners have been granted veto power status in the TRS (Lo and Wang 2013). The five original binding environmental targets in the 11th FYP became nine in the 12th FYP and 12 in the 13th FYP (see Table A1).[1] These binding targets include air quality (sulphur dioxide and nitrogen oxide, PM2.5), water quality, energy efficiency, carbon efficiency, non-fossil fuel energy, water consumption intensity and forest coverage targets (Kostka, 2016). According to the TRS, at each administrative level, the local government has the authority to decide how to allocate targets to subordinate governments and state-owned enterprises.

Although the central government has vowed to take into consideration inter-regional disparities in development levels (Yuan and Feng, 2011; Guo et al., 2019; Ni et al. 2015), neither the national nor local governments have publicly explained how they allocate targets. For instance, the 12th FYP for Energy Saving and Emissions Reduction, which categorised the 31 provinces into five target groups, did not explain the rationale behind this distribution (Caixun, 2011). For the 13th FYP, although the Deputy Director of the National Energy Administration declared that the targets "comprehensively took into account each province's development level, industrial structure, technological level and resource endowment", the plan itself did not mention any target allocation principles, let alone a precise methodology (cnenergy, 2017). The 13th FYP for control of GHG emissions similarly claims that the provinces' "level of development, energy resource

[1] Targets have also been allocated to industrial sectors, especially the so-called "double high" industries (high energy intensity and high emissions).

endowment, strategic position and environmental and ecological conditions" without further detail (State Council, 2017).

A closer look at published provincial targets reveals a rather narrow differentiation. As shown in Table 1, in the 12th FYP, the prescribed energy intensity and carbon intensity targets for most provinces (22/31) were within 1% of the national target. Ni et al. (2015) found that the only discernible distribution pattern was that richer provinces and provinces located in areas singled out for environmental priority received higher targets. This relatively narrow and approximative differentiation fell short of an efficient and fair distribution as put forward in scientific models. For instance, the study by Zhou et al. (2014) showed that the carbon intensity targets allocated to Qinghai, Hainan and Xinjiang were much lower than their scientifically calculated abatement potential. Ohshita and Price also questioned the rationale for granting a mere 15% energy intensity reduction target to Inner Mongolia, a province with skyrocketing energy consumption resulting from rapid industrialisation and coal mining (Ohshita and Price 2011). Despite these scientific studies and the debates they spurred during the 12th FYP, the target range was barely extended in the 13th FYP. Once again, most provinces (19/31) received targets between 1% and 1.5% different than the national target.

**(Table 1 here)**

The data we gathered in this paper show no coherent patterns at the sub-provincial level. In fact, there are significant variations between localities in terms of environmental issues. For instance, during the 11th FYP, Jiangsu distributed a uniform forest coverage target of 20% to all its municipalities, but other provinces like Shandong and Hunan had differentiated targets. However, Shandong, Shanxi and Jiangxi initially allocated uniform

targets energy intensity and a reduction in $CO_2$ emissions. Gradually, all the provinces adopted a narrowly differentiated target approach. In the 12th FYP, only nine provinces (for which data were available) had an energy intensity target range exceeding 5 points; only eight provinces had a $CO_2$ emissions reduction target range exceeding 5 points; similarly, in the 13th FYP, only 10 and seven provinces, respectively, adopted target ranges larger than 5 points. In both plans, with two exceptions (Fujian and Ningxia), the target range was never greater than 10 points.

**(Table 2 here)**

This narrow differentiation approach is illustrated in the three provinces we visited during fieldwork. Table 3 shows that Shandong moved from a uniform target of 17% in the 12th FYP to a narrow differentiation in the 13th FYP (16–22%), while Hunan and Jiangsu distributed almost the same targets to municipalities in both plans (15–17% and 17–18%, respectively). These narrow target ranges do not reflect the wide and widening intra-provincial economic differences. For instance, in Shandong province, coastal Qingdao's per capita GDP is five times higher than in rural Heze, but the latter received a (slightly) higher energy intensity reduction target (17% vs. 16%) in the 13th FYP, even though many polluting industries have relocated there to cut costs. It is hard to see which criteria the province considered when deciding on such a distribution. However, Jiangsu did make an exception for the heavily industrialised Lianyungang and Suqian prefectures (both 10%).

*(Table 3 here)*

The data collected for county-level targets indicate similar variations in the distribution approach. As shown in Table 4, in the 12th FYP, Jinan, the capital of Shandong, simply passed on the uniform 17% energy intensity reduction target received from the province to its 10 counties and districts without differentiating between urban and rural areas or making an exception for its industrial development zone. In the 13th FYP, however, following changes at the province level, Jinan introduced marginal differentiation (16–18%) and lowered the target of the industrial zone (14%). The practice of granting more emissions space to industrial zones was also found elsewhere: For example, in order to accommodate the development of harbour activities, Yancheng municipality (Jiangsu province) gave lower targets to its coastal counties (Yancheng Government, 2014). By contrast, the Chenzhou municipality (Hunan province) distributed marginally differentiated targets (16–18%) to its 11 counties and districts in the 13th FYP.

**(Table 4 here)**

Finally, at the county/district level, our interviews produced anecdotal evidence indicating that some county-level bureaus did pass on additional energy intensity targets to township governments, although the majority did not (personal communication, 22 May 2012, county in Chenzhou). The officials who adopted environmental targets seemed to use either uniform or marginally differentiated targets. For instance, in one county in Hunan, leaders set the same annual energy intensity targets of -3.43% per year for the entire planning period, while in a neighbouring county, energy intensity targets started high with 5% for the first year and decreased to 3.5% over time. There, the officials adopted this descending method because they believed there would be less and less room for energy savings (Kostka, 2016).

In summary, the data gathered in this paper indicate that local governments have not used scientifically differentiated targets in either the 12th or the 13th FYP. When they have used differentiated targets, the distribution method seemed to cater mostly to industrial development needs instead of considerations for equity and efficiency, as proposed in scientific models.

## Factors explaining the crude target allocation practices in China

Based on the literature, the failure to adopt scientifically and equitably differentiated targets may be explained by the absence of available scientific allocation methods at the local level, as well as the high costs involved in the process of gathering the information necessary to implement them. However, current practices are also sustained by political factors relating to the institutional logic of the TRS, such as how implementers respond to career incentives and the lack of coordination of environmental targets with other policy targets, especially GDP growth.

### *Absence of scientific and transparent allocation methods at the local level*

Official reports and our fieldwork interviews indicate that local governments have seldom sought scientific collaborations to rationalize target allocation. An exception to this finding is the handful of provincial governments that, in 2011, decided to join forces with universities and research institutes to develop scientific target distribution models and persuade central authorities to adopt differentiated targets in the 12th FYP (Oshita and Price, 2011). Instead, targets were allocated based on rough evaluations and estimates (Xiao, 2012 quoted in Zhou et al., 2014: 25; various instances of personal communication, including 25 May 2012, county in Chenzhou). As a result, the negotiations around local

target allocations do not refer to objective criteria, which has an adverse effect on the planning system's legitimacy and the implementation by subordinate governments.

For instance, Anhui and Fujian provinces both received a provincial energy intensity target of 16%, despite substantial differences between the provinces in terms of the economic and energy structure. Interviews with leading Anhui officials in 2010 found that, faced with what they perceived as an unreasonable target, local leaders were inclined to disregard energy-saving mandates and, instead, prioritize Anhui's need for economic development. As we will see below, the lack of an objective reference partly explains the tendency of superiors to distribute uniform targets and of subordinates to renegotiate targets unilaterally.

***High information gathering costs***

One important reason for the absence of interest in a scientific distribution of targets may be the lack of capacity to gather and process the necessary high-quality information from industries at the local level. Local officials in charge of energy and emission savings often lack the necessary technical knowledge and have to rely on self-reporting by enterprises, which they cannot always verify. The director of a municipal Economic Commission Bureau admitted that he was unable to verify the energy consumption data provided by enterprises since he did not have access to detailed enterprise-level data or sectoral benchmarks for energy usage (personal communication, 28 May 2012, Chenzhou). An official at a municipal Water Resource Bureau also noted how staff shortages and the lack of coordination across departments impeded the elaboration of scientifically differentiated targets:

> In our bureau, I'm the only person in charge of water management, and I don't have time to go to enterprises and counties to do checks. I also can't get enterprise data

> on industrial value-added figures from the Statistical Bureau; therefore, it is very difficult for me to estimate scientifically how much water is consumed by enterprises at the county level. [Given our constraints,] my main job is to sit in my office and write documents; you can also say I "play with words" (*wan wenzi*) (personal communication, 29 May 2012, Chenzhou)

Inadequate sub-provincial statistical systems further complicate data collection. Whereas pollution data for regions and large emitters have improved significantly thanks to the installation of self-reporting sensors and more frequent monitoring, local energy and $CO_2$ accounting systems have relied mostly on enterprises self-reporting to the statistical bureaus. Despite improvements in verification, these systems have frequently struggled with false reporting and reporting delays (Kostka, 2016). Moreover, not only do the calculation methodologies vary across the country (Li et al., 2014: 953), but the fact that the targets are intensity-based (per unit of GDP) enabled major distortions. For example, in the 11$^{th}$ and 12$^{th}$ FYPs, intensity-based targets incentivized local cadres to accelerate and diversify local growth rather than improve the local industries' energy efficiency. In response to these practices, the central government added absolute energy consumption targets for local governments in the energy strategy of 2014 and in the 13$^{th}$ FYP (Qi, 2014). However, these new absolute targets do not solve the problem since most localities rely on industry to reduce energy consumption, and industries have their own, intensity-based targets (personal communication, Jiangsu, 18 March 2019).

Without sufficient capacity to gather and process reliable emissions data, uniform or hardly differentiated targets are a practical default option, even though this inevitably results in very inequitable distribution. For example, within the same municipality in Hunan, one EPB director reported that air pollution targets were "easy", while the EPB directors of two neighbouring counties felt they were "difficult" (personal

communication, 21, 23 and 28 May 2012, three counties in Chenzhou). Such practices generate significant resentment and push unreasonably burdened localities to fake data or simply give up on reaching targets.

***Politically motivated interference in allocation***

Another problem stemming from the TRS is that it ties sanctions for environmental target achievement to officials' career incentives since the main sanction for non-fulfilment is its individual effect on financial benefits and career prospects. While a powerful incentive, this mechanism also implies that leading cadres' career motivations and calculations interfere with the target allocation process. Some officials eager for a promotion and bonus payments might find it appealing to use unreasonable means to meet their targets (Gao, 2010). A commonly used strategy is to inflate targets when passing them down to subordinate levels, which ensures against the possible failure of some environmental projects and criticism from higher levels. This phenomenon is visible in Hunan (Table A2), where the Chenzhou municipality's 12$^{th}$ FYP sulphur dioxide ($SO_2$) emissions reduction target was -8%, but district-level targets were -8.7% in Suxian and -10% in Zixing. In the 13$^{th}$ FYP, the contrast was even greater since the municipality target was -13%, while the two districts' targets were -30% and -25%, respectively. The same inflation towards the bottom was found in Weifang (Shandong), where the municipality's $SO_2$ emissions reduction target was -18.1%, but that of Fangzi and Zhucheng counties was -19.2% and -23%, respectively. Other emergency strategies involve drastic measures commonly referred to as "*yi dao qie*", such as cutting electricity to companies or forcing factories to halt production in order to "meet" the target.

In response, we also found evidence of subordinates deliberately undermining their achievements in order to prevent higher targets. Some local officials complained

that their superiors had given them higher targets because they were perceived as especially capable. This phenomenon was commonly referred to as "whipping the fast and hard-working cattle" (*bian da kuai niu*). Interviewees described receiving unattainable targets as harmful to morale; in some cases, local officials gave up trying to achieve what they considered to be unattainable targets. For example, the director of a county-level DRC complained that even if he worked very hard, his energy target was out-of-reach, and he had no choice but to play with the numbers (personal communication 10 July 2010, Shanxi).

***Poor coordination with other policy targets***

Finally, interviews also confirmed that environmental targets are not sufficiently coordinated with other targets in the TRS. This is a well-known phenomenon since for decades the pursuit of GDP targets has hampered the implementation of environmental norms. The purpose of making environmental targets 'binding' on the target responsibility system was precisely to rebalance officials' incentives with environmental protection goals. Despite these efforts, local governments have continued to set economic growth targets that are substantially above the national target, thereby exacerbating tensions with environmental goals. For instance, in the 12$^{th}$ FYP, 16 provinces set their FYP target above 10%, while the national target was only 7%. Li et al. (2014: 954) calculated that if provinces achieved their growth targets, energy intensity at the national level would decrease by only 14.9% instead of the targeted 16%.

These tensions are more acute at the bottom level since environmental and GDP targets are both inflated when they pass down the administrative hierarchy (see Tables A2 to A4 in the Appendix). For example, all nine counties visited during fieldwork in Shandong, Hunan and Jiangsu had set growth targets above 12% during the 12$^{th}$ FYP. In

Suxian district (Hunan), local leaders initially proposed a growth rate well above 17%, but municipal leaders lowered the rate to 17% (personal communication, 22 May 2012, Suxian Chenzhou). In the 13th FYP, local GDP targets appeared to be less inflated but remained much higher than the national target. For instance, whereas the national growth target was 6.5%, it was 8.5% in Hunan province: Chenzhou municipality, Rucheng county, Suxian county and Zixing county had growth targets of 9%, 10.5%, 9.5% and 8%, respectively.

With both environmental and GDP targets labelled "hard" or "veto", some local governments face a Cornelian dilemma: Whereas welcoming a new industrial project may mean failing to meet an environmental target and vice versa, closing a polluting factory or refusing a project entails slower GDP growth – at least in the short term (Chen and Naughton 2017).

## The local politics of target allocation

With heightened stakes, the distribution of environmental targets has become a politically sensitive process. While the scope for bargaining targets has varied from place to place, over time and between targets of different types, the absence of an objective methodology has mostly encouraged subordinate levels to lobby their superiors to obtain or renegotiate their targets using opaque processes that reinforce the unfairness of the allocation outcome.

### *Debates about fairness in target allocation*

As mentioned above, the negotiations of the 12th FYP spurred a lot of scientific and public debates about fairness and efficiency.

In 2011, a "tug-of-war" emerged between the central and provincial governments over the allocation of efforts (Feng and Yuan, 2011: 35). On the one hand, many central

and western provinces demanded that their eastern counterparts take the lead, emphasising that the latter had consumed their low-cost energy and labour for the sake of rapid development and that it was now their time to 'develop first'. On the other hand, eastern provinces argued that they were already comparatively energy-efficient, and that that it would be more cost-effective to reduce emissions in western and central China (Sina, 2011).

These debates about fairness trickled down to the local level, although they received little media coverage. In 2012 in Weifang, for instance, county leaders at a joint municipal committee meeting had heated debates about the allocation of energy intensity targets. Shouguang, an industry-heavy county, argued that because it had a more extensive industrial base, it should receive lower targets than agricultural counties; otherwise, it would entail an unrealistically heavy workload (personal communication, 10 May 2012, Weifang). By contrast, leaders from agricultural counties like Fangzi argued that, considering their small industrial base and undiversified economy, they had very little to spare for energy savings. Their disadvantageous economic structure also made it difficult for them, unlike localities with strong industry and higher revenue, to attract new energy-efficient enterprises. In the end, the Weifang joint committee decided to distribute barely differentiated targets (personal communication, 10 May 2012, Weifang).

During the negotiations of the 13$^{th}$ FYP in 2016, there was even less coverage of debates about targets distribution, but lingering negotiations of the national ETS regulations indicate that bargains continued. This tension was revealed in a letter published with the draft ETS regulations in 2016, which reported that several provinces were concerned that the anticipated centralized allocation of emissions' rights to companies ignored the development gap between them (NDRC, 2016).

Some complaints about the unfairness and unfeasibility of targets at the local level appeared online. Local officials in the Changji Hui autonomous prefecture in Xinjiang argued that energy intensity targets were unreasonable since, for poor western localities, energy-intensive industries relocating from the eastern provinces offered the only opportunity to secure long-term GDP growth (Changji government, 2017).

***Negotiation tactics and gaming behaviour***

This perceived lack of impartiality and fairness in the allocation of targets has encouraged individual gaming behaviours in both allocation and implementation (Gao, 2010).

During the 11th FYP, a "three-stage" process was used to allocate targets among provinces (Feng and Yuan, 2011: 35). The NDRC openly negotiated the energy intensity reduction targets with provincial governments. Fifteen provinces submitted a target equal to the national target of 20%, 12 provinces proposed targets below 20%, and four provinces proposed targets above 20%. The NDRC asked the 12 provinces that had set lower targets to match or move closer to the national target. Following another round of discussions, 11 of the 12 provinces (Tibet being the exception) adjusted their target upwards (Li et al. 2014: 957; Feng and Yuan, 2011: 35). But some of the provincial targets were renegotiated during implementation. Jilin and Shanxi provinces, which had set very ambitious energy-saving targets of 30% and 25%, respectively, requested that they be lowered to the national average of 22% (Feng and Yuan, 2011: 35; Xinlang News, 2011). Inner Mongolia's target was also lowered from 25% to 22%. Xinjiang, which completely missed its target (8.9% instead of 20%), was removed from the final evaluation. Thus, implementation was more flexible than the "veto target" rhetoric seemed to prescribe.

Nonetheless, burnt by this experience, the provinces actively lobbied for lower targets in the 12th FYP. For example, in a public letter to the central government in December 2010, the Guangdong provincial government wrote that their provincial energy intensity level was already just 60% of the national average (China News, 2010). Ningxia, Yunnan and Inner Mongolia all issued statements calling on central planners to adopt more differentiated targets (NZTV, 2012; Eeo.Com.cn, 2012). Inner Mongolia, for instance, claimed that its energy-intensive industrial structure should be taken into account. Its first demand was partly successful since the province obtained a 15% target, which experts considered comparatively low. Inner Mongolia and other provinces also suggested exploring the establishment of a consumption-based accounting system of emissions to address carbon leakage problems. Shandong, for instance, pointed out that half of the 14 million tonnes of fertilizer it produced annually were exported to other provinces (Sina, 2011).

In March 2011, when the NDRC published the planned energy intensity targets for public consultation, it acknowledged that they were the result of "extensive negotiations" (Caixun 2011), despite some provinces expressing dissatisfaction with the outcome: Ningxia, for example, had lobbied for a mere 2.1% energy intensity reduction target but received a much more ambitious target of 15% (Feng and Yuan, 2011: 35). According to official NDRC reports, notwithstanding complaints and challenges, all the provinces met their 12th FYP target, even though some government statements may be dubious. Since 2014, the NDRC has only published the total scores of the provincial energy saving evaluations, which include a large number of performance indicators and are vaguely formulated as "over-complete", "complete", "basically complete" and "incomplete". This practice may have helped to conceal the non-fulfilment of provincial targets. For instance, one may wonder how Hainan could obtain a "complete" score in

2015 when it had only met 23% of its target in 2013 (when the last data were published) or how Xinjiang could obtain a "fundamentally complete" score when in fact its energy intensity increased in the 12th FYP. Again, this suggests that renegotiations and accommodations occurred behind the scenes and that target implementation was likely not as strict as the "veto" rhetoric implied.

At the sub-provincial level, officials have often negotiated and renegotiated targets, even though the situations vary significantly. In some places, targets were reportedly debated and negotiated at large meetings in which subordinate levels participated (personal communication, Shandong, 8 March 2019; Jiangsu, 18 March 2019). Some localities, like the EPB of Chenzhou municipality (Hunan), have publicized preliminary targets on their website to seek responses from subordinate levels and the public (Chenzhou Government Website, 2014). Neighbouring Rucheng county's DRC published energy intensity targets for townships online before finalizing targets. It had initially put forward uniform targets to "test the waters", but following discussions with concerned township leaders, it distributed slightly lower targets to some of them (personal communication, 25 May 2012, Rucheng). However, these practices have not been pursued across the board, and it is difficult to generalize from these accounts. Our data and interviews suggest that, in other places, targets are decided by higher-ups and communicated to each subordinate jurisdiction without ever being disclosed to the public (personal communication, Jiangsu, 18 March 2019).

Bargaining and consultations enable frequent communication within the administration, which, some authors have argued, enhances planning and policy implementation processes (Heilmann and Melton, 2013: 607). However, bargaining is also resource- and time-consuming. As many researchers have asserted, such an environment encourages "gaming behaviours", where higher and lower levels suggest

targets despite being fully aware that the other party will bargain against them (Li, 2015, Xinlang News, 2011, Ran 2013). Feng and Yuan note that "provincial governments make sure to keep their first proposal low, while the central government, aware that its response will again be undercut, keeps something in reserve" (Feng and Yuan, 2011: 36). Such games reward smart negotiators and punish those who communicate honestly. Some local governments even reported that they did not set emission and energy targets at the maximum level in the 11th and 12th FYPs, in order to leave room for further reductions in the 13th FYP (personal communication, Hunan, 25 May 2012). Thus, political considerations lead to a slower implementation of energy reduction and emission savings than what was known to be possible. Absent a transparent process, these bargains further undermine the targets' legitimacy and result in allocation outcomes that reflect neither local conditions nor the ability to pay nor fairness principles (Ran 2013).

**The impact of central environmental inspections during the 13th FYP**

During the 13th FYP, a new command and control policy mechanism interfered with the environmental target setting system. Under Xi Jinping, the Ministry of Environmental Protection (MEP) turned to centralized campaign-style measures and a focus on oversight and punishment for violations of environmental norms without regard for the previous attention to fairness.

In 2015, the Central Leading Small Group on Comprehensively Deepening Reforms, a new organ of the Chinese Communist Party, launched a central environmental inspection campaign. The inspection teams were deployed by the MEP to conduct on-site reviews of local governments' environmental protection efforts. Five rounds of inspections, spanning from December 2015 to late 2017, covered all 31 provincial-level regions in mainland China. They were followed by a review campaign (*huitou kan*) in a

selected number of provinces in 2018, and another review round was announced in early 2019 to span over the next four years, turning them into a “new long-term mechanism”, as Environment Minister Li Ganjie put it, instead of an extraordinary measure (Yicai, 2019).

Most provinces launched their own inspections, both to prepare the required “replies” to the central inspections and to anticipate the subsequent “reviews”. For instance, Hunan province carried out what it called a “storm of rectification” shortly before the expected review in 2018 by punishing 167 officials, putting nearly 200 people in detention, imposing fines totalling 81 million yuan and closing 3,734 polluting companies (Xinhua, 2018). In Shandong, the provincial government organized its own round of provincial inspections in 2018, punished hundreds of officials and fined 443 companies a total of 25 million yuan (Ifeng, 2018).

**(Table 5 here)**

The central environmental inspections differ in several important ways from environmental targets under the TRS. Firstly, whereas targets are implemented and evaluated level by level from the central to the local level, the central inspections have been carried out directly by the central government with the clear objective of bypassing intermediary levels and punishing complacent local officials (Chang and Wang, 2016). These inspection teams have deliberately been made independent of local governments and are tasked solely with uncovering environmental problems and bad performances, regardless of local economic conditions.

Secondly, the inspections have put much more emphasis on enforcement and repression. The detailed enumeration of punishments systematically published in the

press (see Table 5) signals that pollution and the violations of environmental norms now have severe legal and political consequences.

Thirdly, as Minister Li Ganjie pointed out, the inspections have focused on identifying and "solv[ing]" outstanding problems (Hou, 2018). Poor achievement of target performance was only one of the possible problems, which more prominently featured those reported to the inspectors "by the masses". The lists of "typical problems" published by both the central government and the provinces vary greatly in kind and level of gravity. They range from water pollution from chicken farms to the poor implementation of car quality standards (people.cn, 2018).

While these inspections' long-term effects are still being debated, their short-term effect has been strongly felt. Many lingering problems had been tackled effectively for the first time. However, many emphasize the cost of the inspections for local economies and the potentially perverse effect on local officials' behaviour, which impacts the sustainability of the campaign in the long term. There have been complaints against the authoritarian measures (*yi dao qie*) employed by local authorities to 'resolve' the problems. The central government's response to these criticisms has been to condemn "yi dao qie" measures and to promote the legalization (*fazhihua*) of the inspections. Shandong province was one of the first to do so in a new provincial environmental regulation passed on 30 November 2018. Although it had invited comments from the public, no changes were ultimately made to the text.

Another issue for scrutiny is the extent to which inspectors have been able to check the work of local bureaucrats and ensure a thorough resolution of the most severe environmental problems. The fact that the environmental minister vowed to deploy an array of new technologies in future inspections is an implicit recognition of the limits that inspectors face when relying solely on information provided by local bureaucrats.

Finally, the impact of environmental inspections on the implementation of environmental targets is questionable, since systems have run in parallel without a priori coordination. On the contrary, the central government adopted new targets during the 13th FYP, like the three-year "Blue Sky Battle Plan" adopted in 2018, to increase the stringency for the Beijing–Tianjin–Hebei area, the Yangtze River Delta region and the plains of the Yellow River (State Council, 2018). Provinces like Shandong have adopted new and more severe local coal control targets for 2018–2020 to reflect the titular "battle" (Shandong Government, 2018).

In some cases, the resolution of specific problems following the inspectors' visits may have helped to meet environmental targets (personal communication, Shandong, 8 March 2018). For instance, Hunan reported that its "storm of rectification" had resulted in a 5.8% drop in energy consumption (Xinhua, 2018). In other cases, it may have absorbed all the limited human and financial resources and diverted efforts from less emphasised targets, such as the reduction of $CO_2$ emissions (personal communication, Jiangsu, 18 March 2019). Moreover, authoritarian measures like temporary closures and hefty fines may have affected enterprises' capacity to invest in the solutions necessary to reduce energy consumption in the long term, as an industry association report pointed out (Xinhua, 2019).

Overall, the pressure brought by the inspections to showcase strength and determination superseded debates about economic efficiency and fairness. Following the winter of 2017, when peasants in Hebei were banned from burning coal, some started mentioning the "ethical divide" of the war on pollution (Ma 2017). As a result, at the 2019 National People's Congress, Premier Li Keqiang declared the need to rebalance environmental protection and economic development (Li, 2019).

## Conclusion

This paper examined why binding environmental and energy targets passed down the Chinese administrative hierarchy have neglected equity and efficiency considerations. Despite the widely acknowledged advantages of relying on a scientific and differentiated approach to target allocation, Chinese bureaucrats have often used barely differentiated targets and ignored significant variations in economic and energy structures between and within provinces. When differentiated targets have been adopted, local governments have provided no transparent or scientific method explaining the rationale behind their decision, which undermines the targets' legitimacy and compliance by subordinate levels.

A combination of factors can explain the reluctance to allocate targets in a more scientific and equitable manner. Firstly, local officials face significant information and capacity constraints. They often lack the high-quality information needed to identify appropriate target levels for the subordinate governments. Even where such information is available, officials would struggle to make effective use of it, given the lack of qualified personnel and funding. Secondly, local politics sometimes interferes with target allocation decision-making processes. To avoid distributional conflicts among subordinate governments, officials often choose to distribute in a homogenous way and to ignore the widely varying potential to deliver on plans.

This system showed its limits as environmental problems went unresolved and the centre grew frustrated with persistent issues related to fake reporting. The 13$^{th}$ FYP saw the return of campaign-style measures to address implementation issues and added another significant political impediment to the pursuit of fairness in the distribution of environmental efforts.

The findings in this paper have broader implications for China's low-carbon transition. Certainly, by disaggregating national targets into local ones, central planners

have somewhat corrected the overwhelming emphasis on economic growth that characterized the first decades of the reform era. However, both the TRS and the inspections have notable limitations. They rely heavily on local officials but fail to take into consideration the objective differences in local conditions and the local bureaucratic capacity to harness targets in order to make sustainable gains for the environment.

The NDRC's sole reliance on the target allocation system to begin to address the distributional impacts of climate and energy policies can be called into question. There might be a better means to achieve this end. Some have suggested using market mechanisms, and several studies have looked into ways of using emissions' trading to solve it. Other possible solutions include bargains in which poorer localities with higher energy intensities and fast economic growth would receive higher energy-saving targets in exchange for subsidized technology and fiscal transfers (Li et al., 2014: 957). However, any solution addressing fairness issues must take into account the local politics created by the co-existence of the TRS and the central inspections.

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**Declaration of interest statement**

No declaration of interest

**Data availability statement**

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Table 1: Carbon intensity and energy intensity targets of the 31 provinces in the 12th (2011–2015) and the 13th FYP (2016–2020)

| **Carbon Intensity Targets** (in %) | | | | | | **Energy Intensity Targets** (in %) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **12th FYP target** | *No. of pro-vinces* | *Provinces* | **13th FYP target** | *No. of pro-vinces* | *Provinces* | **12th FYP target** | *No. of pro-vinces* | *Provinces* | **13th FYP target** | *No. of pro-vinces* | *Provinces* |
| - | - | - | 20.5 | 8 | Guangdong, Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Shandong | - | - | - | - | - | - |
| 19.5 | 1 | Guangdong | 19.5 | 6 | Fujian, Jiangxi, Henan, Chongqing, Sichuan, Hubei | - | - | - | - | - | - |
| 19 | 4 | Tianjin, Shanghai, Jiangsu, Zhejiang | - | - | - | - | - | - | - | - | - |
| 18 | 4 | Beijing, Liaoning, Shandong, Hebei | **18** | 8 | Shanxi, Liaoning, Jilin, Anhui, Guizhou, Hunan, Yunnan, Shaanxi | 18 | 5 | Tianjin, Shanghai, Jiangsu, Zhejiang, Guangdong | - | - | - |
| 17.5 | 2 | Fujian, Sichuan | - | - | - | - | - | - | - | - | - |
| **17** | 9 | Jilin, Chongqing, Hubei, Shaanxi, Shanxi, Hunan, Henan, Jiangxi, Anhui | 17 | 5 | Inner Mongolia Gansu, Heilongjiang, Guangxi, Ningxia | 17 | 4 | Beijing, Liaoning, Shandong, Hebei | 17 | 8 | Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Guangdong, Shandong |
| 16.5 | 1 | Yunnan | - | - | - | - | - | - | - | - | - |
| 16 | 6 | Inner Mongolia, Ningxia, Heilongjiang, Guangxi, Gansu, Guizhou | - | - | - | **16** | 12 | Fujian, Jilin, Chongqing, Hubei, Shaanxi, Heilongjiang, Shanxi, Hunan, Henan, Sichuan, Jiangxi, Anhui | 16 | 8 | Fujian, Anhui, Jiangxi, Henan, Hubei, Hunan, Chongqing, Sichuan |
| - | - | - | - | - | - | 15 | 6 | Inner Mongolia, Ningxia, Guangxi, Yunnan, Gansu, Guizhou | **15** | 5 | Shanxi, Liaoning, Jilin, Heilongjiang, Shaanxi, |
| | | | | | | | | | 14 | 6 | Inner Mongolia, Guangxi, Guizhou, Yunnan, Gansu, Ningxia |
| | | | 12 | 4 | Xinjiang, Hainan, Qinghai, Tibet | - | - | - | - | - | - |
| 11 | 2 | Xinjiang, Hainan | - | - | - | - | - | - | - | - | - |
| 10 | 1 | Qinghai, Tibet | - | - | - | 10 | 4 | Xinjiang, Hainan, Qinghai, Tibet | 10 | 4 | Xinjiang, Hainan, Qinghai, Tibet |

*Shaded grey area shows targets within a (plus or minus) 1% range from the national target (in bold).

*Sources: 12th and 13th FYP for Greenhouse Gas (GHG) Emissions Controls and 12th and 13th FYP for Energy Saving and Emissions Reduction*

Table 2: Allocation of carbon intensity and energy intensity municipal targets, 12th FYP (2011–2015) and 13th FYP (2016–2020)

| | Energy Intensity Target (in %) | | | | Carbon Intensity Target (in %) | | | |
|---|---|---|---|---|---|---|---|---|
| | 12th FYP | | 13th FYP | | 12th FYP | | 13th FYP | |
| | *National Target* | *Range for Provinces* | *National Target* | *Range for Provinces* | *National Target* | *Range for Provinces* | *National Target* | *Range for Provinces* |
| **National** | 16 | 10-18 | 15 | 10-17 | 17 | 10-19.5 | 18 | 12-20.5 |
| **Provinces** | *Provincial Target* | *Range for Municipalities* | *Provincial Target* | *Range for Municipalities* | *Provincial Target* | *Range for Municipalities* | *Provincial Target* | *Range for Municipalities* |
| Jiangsu | 18 | 13-19 | 17 | 10-18 | 19 | 14-20 | 20.5 | 20.5*** |
| Guangdong | 18 | N/A | 17 | 16- 19.3 | 19.5 | 18.5-21 | 20.5 | 19.5-23 |
| Hebei | 18 | N/A | 17(19) * | 18.7***** | 19 | N/A | 20.5 | 20 -22 |
| Shanghai | 18 | 15-18 | 17 | 15-17 | 19 | N/A | 20.5 | 15 -18 |
| Tianjin | 18 | N/A | 17 | N/A | 19 | N/A | 20.5 | 20-22 |
| Zhejiang | 18 | N/A | 17 | 16-23 | 19 | N/A | 20.5 | 18-25 |
| Beijing | 17 | 16-40**** | 17 | 16-19 | 18 | N/A | 20.5 | 20 -21 |
| Shandong | 17 | **17**** | 17 | 16-22 | 18 | **18**** | 20.5 | 20 -23 |
| Liaoning | 17 | N/A | 15 | 15-16 | 18 | N/A | 18 | N/A |
| Hubei | 16 | 12-18 | 16 | 12-17 | 17 | 13-19 | 19.5 | 15.5-20.5 |
| Henan | 16 | 15-17 | 16 | 15-17 | 17 | 15-19 | 19.5 | 18 -20 |
| Hunan | 16 | 15-17 | 16 | 15-17 | 17 | 16-18 | 18 | N/A |
| Fujian | 16 | 5-19 | 16 | 10-20 | 17.5 | 17-20 | 19.5 | 19-20.5 |
| Sichuan | 16 | 10-17 | 16 | 8-17 | 17.5 | 11-19 | 19.5 | 15-20.5 |
| Shaanxi | 16 | 12-17 | 15 | 12-16 | 17 | N/A | 18 | 15 -19 |
| Jiangxi | 16 | N/A | 16 | 16-20 | 17 | **17**** | 19.5 | 18 -21 |
| Anhui | 16 | 10-17 | 16 | 10-17 | 17 | 11-18 | 18 | 12 -19 |
| Shanxi | 16 | N/A | 15 | **15**** | 17 | **17**** | 18 | 18 -19 |
| Jilin | 16 | N/A | 15 | 11-15.5 | 17 | N/A | 18 | 17.9-18.5 |
| Chongqing | 16 | 10-18 | 16 (15) * | N/A | 17 | 10.5-19 | 19.5 (16) * | 18.5-22 |
| Heilongjiang | 16 | N/A | 15 | 10-15 | 16 | N/A | 17(18) | 18*** |
| Guizhou | 15 | 14-16 | 14 | 13-15 | 16 | 15-18 | 18 | 17 -20 |
| Inner Mongl. | 15 | 14-16 | 14 | 12-15 | 16 | N/A | 17 | 15-18 |
| Guangxi | 15 | 11-19 | 14 | 9-19 | 16 | 12-20 | 17 | 10 -22 |
| Gansu | 15 | 12-17 | 14 | 12-20 | 16 | N/A | 17 | 14-17.5 |
| Ningxia | 15 | N/A | 14 | 5-17 | 16 | N/A | 17 | 7-19 |
| Yunnan | 15 | 8-18 | 14 | 6-15 | 16.5 | 8-20 | 18 | 10-23 |
| Hainan | 10 | 8-11.5 | 10 | 8-11 | 11 | N/A | 12 | 8-16 |
| Tibet | 10 | 6-13 | 10 | 9-12 | 11 | 7-14 | 12 | 11-14 |
| Xinjiang. | 10 | N/A | 10 | N/A | 11 | N/A | 12 | N/A |
| Qinghai | 10 | N/A | 10 | 9-11 | 10 | N/A | 12 | 11-13 |

* Province plan adopted a different provincial target than the one put forward as part of the national FYP.
**Locality distributed the same target to all its municipalities.
*** Data was found only for one municipality.
**** Beijing's Shijingshan district is the only district that received a target of 40%; all the other districts received targets ranging from 16% to 19%
***** This more ambitious target was allocated to large municipalities under the Beijing–Tianjin–Hebei air pollution plan. The target for other municipalities is unknown

*Source: Authors' municipal target database, 2019*

Table 3: The 11th and 12th FYP energy intensity targets at municipal level in Shandong, Hunan and Jiangsu.

| Shandong | | | Hunan | | | Jiangsu | | |
|---|---|---|---|---|---|---|---|---|
| Localities | 12th FYP | 13th FYP | | 12th FYP | 13th FYP | | 12th FYP | 13th FYP |
| **Province** | **17** | **17** | **Province** | **16** | **16** | **Province** | **16** | **17** |
| Jinan | 17 | 16 | Changsha | 16 | 16 | Nanjing | 19 | 18 |
| Qingdao | 17 | 16 | Zhuzhou | 17 | 17 | Wuxi | 19 | 18 |
| Zibo | 17 | 18 | Xiangtan | 17 | 17 | Xuzhou | 18 | 18 |
| Zaozhuang | 17 | 17 | Hengyang | 16 | 16 | Changzhou | 19 | 18 |
| Dongying | 17 | 16 | Shaoyang | 16 | 16 | Suzhou | 19 | 18 |
| Yantai | 17 | 16 | Yueyang | 17 | 17 | Nantong | 17 | 17 |
| Weifang | 17 | 17 | Changde | 15 | 16 | Lianyungang | 17 | 10 |
| Jining | 17 | 17 | Zhangjiajie | 15 | 15 | Huai'an | 18 | 17 |
| Tai'an | 17 | 17 | Yiyang | 16 | 16 | Yangcheng | 17 | 17 |
| Weihai | 17 | 16 | Quzhou | 17 | 17 | Yangzhou | 17 | 17 |
| Rizhao | 17 | 18 | Yongzhou | 16 | 16 | Zhenjiang | 18 | 18 |
| Caiwu | 17 | 18 | Huaihua | 16 | 16 | Taizhou | 18 | 17 |
| Linyi | 17 | 17 | Loudi | 17 | 17 | Suqian | 13 | 10 |
| Dezhou | 17 | 17 | Xiangxi | 15 | 15 | - | - | - |
| Liaocheng | 17 | 19 | - | - | - | - | - | - |
| Bingzhou | 17 | 22 | - | - | - | - | - | - |
| Heze | 17 | 17 | - | - | - | - | - | - |
| Target range | 17-17 | 16-22 | | 15-17 | 15 -17 | | 13-19 | 10-18 |

* *Rizhao municipality was allowed to increase its energy intensity by 25.80% as a new steel factory had opened in 2006.*

*Source: Energy Saving and Emission Reduction 12th and 13th FYP plan of Shandong Province, Hunan Province and Jiangsu Province.*

Table 4: Energy intensity targets at county/district level: Jinan municipality, Shandong province (11th, 12th and 13th FYP); Chenzhou municipality, Hunan province; and Yancheng municipality, Jiangsu province (13th FYP).

| Energy intensity targets（%） | | | | | | | |
|---|---|---|---|---|---|---|---|
| Locality | 11th FYP | 12th FYP | 13th FYP | Locality | 13th FYP | Locality | 13th FYP |
| **Jinan Municipality** | **22.04** | **17** | **16** | **Chenzhou Municipality** | **17** | **Yancheng Municipality** | **17** |
| Lixia District | 22.00 | 17 | 15 | Beihu District | 17 | Tinghu District | 17 |
| Shizhong District | 22.10 | 17 | 16 | Suxian District | 18 | Yandu District | 17 |
| Huaiyin District | 22.03 | 17 | 15 | Zixing City | 18 | Dafeng District | 17 |
| Tianqiao District | 22.08 | 17 | 16 | Guiyang County | 18 | Xiangshui County | N/A |
| Licheng District | 22.04 | 17 | 18 | Yizhang County | 17 | Binhai County | N/A |
| Changqing District | 22.03 | 17 | 17 | Yongxing County | 18 | Funing County | 19.9 |
| Zhangqiu City | 22.07 | 17 | 17 | Jiahe County | 17 | Sheyang County | N/A |
| Pingyin County | 22.00 | 17 | 17 | Linwu County | 16 | Jianhu County | N/A |
| Jiyang County | 22.10 | 17 | 16 | Rucheng County | 16 | Dongtai City | N/A |
| Shanghe County | 22.08 | 17 | 16 | Guidong County | 16 | South City Industrial Development Zone | N/A |
| Jinan High Tech Industrial Development Zone | 16.90 | 17 | 14 | Anren County | 17 | Industrial Development Zone | N/A |
| Target range | 22-22.1 | 17-17 | 14-18 | Target range | 16-18 | Target range | 17-19.9 |

*Source: Jinan municipality 12th and 13th FYP for energy-saving and emissions reduction. The 11th FYP targets are reported in the 12th FYP; Chenzhou 13th FYP for energy-saving and emissions reduction; Yancheng, various districts' FYP.*

Table 5: Punishments in the central environmental inspection campaigns

| Central Environmental Inspection Campaigns | Time Period | Outcome |
|---|---|---|
| **First round** | **Dec 2015 – Sept 2017** | ▪ **Interrogated (*yuetan*) 18 448 officials**<br>▪ **Punished (*wenze*)18199 officials**<br>▪ **Fined over 29,000 companies for a total of 1.43 billion RMB**<br>▪ **Put 1,527 individuals in detention** |
| Pilot case: Hebei | 31 Dec 2015– 14 Feb 2016 | ▪ Interrogated 65 and publicly criticized 60 officials<br>▪ Punished 366 individuals<br>▪ Put 123 in administrative detention<br>▪ Closed-down 200 and fined 125 companies |
| First batch (8):<br>Heilongjiang, Inner Mongolia, Ningxia, Henan, Jiangsu, Jiangxi, Yunnan, Guangxi | 12 July 2016 – 19 Aug 2016 | ▪ Interrogated 2176 individuals<br>▪ Punished 3287 individuals<br>▪ Put 310 individuals in administrative detention<br>▪ Ordered 9617 rectifications<br>▪ Imposed 2659 fines for a total of 198 million RMB |
| Second batch (7):<br>Beijing, Gansu, Shaanxi, Hubei, Shanghai, Chongqing, Guangdong | 24 Nov 2016 – 30 Dec 2016 | ▪ Interrogated 4066 individuals<br>▪ Punished 2682<br>▪ Put 287 in either administrative or criminal detention<br>▪ Ordered 10512 rectifications<br>▪ Fined 5779 companies for a total of 243.032 million RMB |
| Third batch (7):<br>Liaoning, Tianjin, Shanxi, Anhui, Hunan, Guizhou, Fujian | 24 Apr 2017 – 28 May 2017 | ▪ Interrogated 6079, including 353 leading officials (167 at province level and 186 below)<br>▪ Punished 4018<br>▪ Put 355 in either administrative or criminal detention<br>▪ Ordered 20359 rectifications<br>▪ Fined 7086 companies for a total of 335. 8786 million RMB |
| Fourth batch (8):<br>Xinjiang, Tibet, Qinghai, Sichuan, Zhejiang, Jilin, Shandong, Hainan | 7 Aug 2017 – 15 Sept 2017 | ▪ Interrogated 4210, including 396 leading officials (213 at province level and 183 below)<br>▪ Punished 5763<br>▪ Put 364 in either administrative or criminal detention<br>▪ Ordered 32602 rectifications<br>▪ Fined 9181 companies for a total of 465.8384 RMB |
| **"Review" round** | | |
| First batch:<br>Hebei, Henan, Inner-Mongolian Ningxia, Heilongjiang, Jiangsu, Jiangxi, Guangdong, Yunnan | 30 May 2018 – 7 July 2018 | ▪ Interrogated 2819, including 140 leading officials (51 at province level and 89 below)<br>▪ Punished 4305<br>▪ Put 464 in either administrative or criminal detention<br>▪ Ordered 22561 rectifications<br>▪ Fined 5709 companies for a total of 51. 052 million RMB |
| **e.g. Jiangsu** | July 2018 | ▪ Interrogated 396<br>▪ Punished 291<br>▪ Put 42 individuals in detention<br>▪ filled 24 cases for legal investigations<br>▪ ordered 3035 rectifications<br>▪ fined 1274 companies for a total amount of 222. 481 million RMB |
| Second batch:<br>Shanxi, Liaoning, Guilin, Anhui, Shandong, Hubei, Hunan, Sichuan, Guizhou, Shaanxi | 11 Nov 2018 – 6 Dec 2018 | ▪ Interrogated 1804 individuals<br>▪ Punished 2177<br>▪ Put 88 in either administrative or criminal detention<br>▪ Ordered 12240 rectification<br>▪ Fined 2991 companies for a total of 21. 414 360 million RMB |
| **e.g. Shandong** | December 2018 | ▪ Interrogated 52 individuals<br>▪ punished 361<br>▪ Put 6 individuals in administrative or legal detention<br>▪ filled 8 cases for legal investigations<br>▪ ordered 3399 rectifications<br>▪ Fined 418 companies with fines totalling 47.668 million RMB |
| **e.g. Hunan** | December 2018 | ▪ Interrogated 208 individuals<br>▪ Punished 191<br>▪ Put 21 individuals in either administrative or criminal detention<br>▪ Filled 26 cases for legal investigations<br>▪ Ordered 1509 rectifications<br>▪ Fined 295 companies for a total of 15. 7213 million RMB |

*Source: Various government releases on Xinhuanet.*

## Appendices

Table A1: Major Environmental Targets (11th FYP, 12th FYP and 13th FYP)

| Environmental Targets | 11th FYP Target | | 11th FYP (Achieved) | 12th FYP Target | | 12th FYP (Achieved) | 13th FYP Target | |
|---|---|---|---|---|---|---|---|---|
| **Reduction in energy intensity per unit of GDP** | -20% | B* | -19.1% (*not met*) | -16% | B | 18.2% | 15% | B |
| **Reduction in carbon intensity per unit of GDP** | N/A[2] | | | -17% | B | -20% | -18% | B |
| **Non-fossil fuel in primary energy mix** | N/A[3] | | 8.9% | 11.4% | B | 12% | 15% | B |
| **Major pollutants** | COD: -10%<br>$SO_2$: -10%<br>Ammonia: N/A<br>Nit. oxide: N/A | I*<br>I | COD: -12.45%<br>$SO_2$: -14.29%<br>N/A<br>N/A | COD: -8%<br>$SO_2$: -8%<br>Ammonia: -10%<br>Nit. oxide: -10 % | B<br>B<br>B<br>B | COD: -12.9%<br>$SO_2$: -18%<br>Ammonia: -13%<br>Nit. Oxide: -18.6% | COD: -10%<br>$SO_2$: -10%<br>Ammonia: -15%<br>Nit. oxide: -15% | B<br>B<br>B<br>B |
| **Forest coverage** | 20% | B | 20.36% | 21.66% or 14.3 trillion $m^3$ | B | 21.66% | 23.04% | B |
| **Reduction of water consumption per unit of value added of industrial output** | -30% | B | -36.7 | -30% | B | -35% | Reduction of water consumption per unit of GDP | B |
| **Increase of water efficiency coefficient in agricultural irrigation** | 0.5 | I | 0.5 | 0.53 | I | 0.532 | | |
| **Farmland reserves** | 120 million hectares | B | 121.2 million hectares | 121.2 million hectares (or 1.8 billion mu) | B | 124.3 million hectares | 124.3 million hectares | B |
| **Building lad surface increase** | _ | | _ | _ | | _ | < 2,170,666 hectares (or < 32.56 million mu) | B |
| **Comprehensive utilization rate of industrial solid waste** | 60% | B | 69% | _ | | _ | _ | |
| **Air quality** Increase in percentage of days of good air quality of municipalities | _ | | _ | _ | | _ | 76.6 to > 80% | B |
| Reduce the PM2.5 concentration of municipalities which have not | _ | | _ | _ | | _ | 18% | B |

| | | | | | | |
|---|---|---|---|---|---|---|
| yet reached the standard level by | | | | | | |
| **Surface water quality** Increase the percentage of category 3 and higher | – | – | – | – | from 66 to > 70% | B |
| Decrease the percentage of category 5 | – | – | – | – | from 9.7% to < 5% | B |

**B indicates Binding target (yuesuxing); I indicates indicative target (yuqixing).*

*Source: 11th, 12th and 13th Five-Year Plans published by the Chinese government.*

[2] A target of a 20% reduction in carbon intensity was adopted in the white paper on climate change ahead of the Copenhagen summit in 2009, but it was not included in the 11th FYP.

[3] A target of 10% by 2010 of non-fossil energy was included in the 11th FYP, but it was not listed among the "major targets". It was first spelled out in the 2007 Medium and Long-term Development Plan for Renewable Energy and included in the 11th FYP energy strategy and climate white paper in 2008.

Table A2: Targets Trickling Down from Provincial to County Level: Shandong

| **Environmental Targets** | | **National** | **Shandong Province** | **Weifang Municipality** | **Fangzi County** | **Zucheng County** |
|---|---|---|---|---|---|---|
| Energy intensity (%) | *11 FYP Target* | -20 | -22 | -22.5 | -20 | No target |
| | *11 FYP Achieved* | -19.1 | -22.1 | -23.06 | -23.06 | N/A |
| | *12 FYP Target* | -16 | -17 | -17 | -16.5 | -14.5 |
| | *12 FYP Achieved* | -18.4 | -19.8 | -23.7 | N/A | -15.8 |
| | *13 FYP Target* | -15 | -17 | -17 | N/A | N/A |
| Water: COD (%) | *11 FYP Target* | -10 | -14.9* | -18 | -18 | -18 |
| | *11 FYP Achieved* | -12.45 | -19.4 | -19.20 | -20.27 | -23.30 |
| | *12 FYP Target* | -8 | -12 | -13.3 | -13.3 | -13.8 |
| | *12 FYP Achieved* | -12.9 | -12.8 | -13.3 | -15 | -13.8 |
| | *13 FYP Target* | -10 | -11.7 | -11.6 | N/A | N/A |
| Air: $SO_2$ (%) | *11 FYP Target* | -10 | -20 | -8.54 | -8.54 | -8.54 |
| | *11 FYP Achieved* | -14.29 | -23.2 | -11.85 | -9.80 | -11.98 |
| | *12 FYP Target* | -8 | -14.9 | -18.1 | -19.2 | -23 |
| | *12 FYP Achieved* | -18 | -14.9 | -18.1 | -15 | -23 |
| | *13 FYP Target* | -15 | -27 | -28.8 | N/A | N/A |
| Air: NOx (%) | *11 FYP Target* | No target | No target | No target | No target | No target |
| | *11 FYP Achieved* | No target | No target | No target | No target | No target |
| | *12 FYP Target* | -10 | -16.1 | -17.9 | -18.4 | -21.1 |
| | *12 FYP Achieved* | -18.6 | -16.1 | -17.9 | -15 | -21.1 |
| | *13 FYP Target* | -15 | -27 | -29.2 | N/A | N/A |
| Water: NH4 (%) | *11 FYP Target* | No target | No target | No target | No target | No target |
| | *11 FYP Achieved* | No target | No target | No target | No target | No target |
| | *12 FYP Target* | -10 | -13.3 | -16.7 | -17.8 | -19.6 |
| | *12 FYP Achieved* | -13 | -13.5 | -16.7 | N/A | -17.7 |
| | *13 FYP Target* | -10 | -13.4 | -15.5 | N/A | N/A |
| Forestry coverage (%) | *11 FYP Target* | 20 | 22 | N/A | 23 | 35 |
| | *11 FYP Achieved* | 20.36 | 22.8 | 35.2 | 23.6 | 33.5 |
| | *12 FYP Target* | 21.66 | 25 | 35 | 28 | 38.5 |
| | *12 FYP Achieved* | 21.66 | 25 | 35.5 | 28 | 38.6 |
| | *13 FYP Target* | 23 | 20.5 | 35.5 | 30 | 39.8 |
| Water consumption per unit of industrial value added (%) | *11 FYP Target* | -30 | N/A | N/A | -30 | N/A |
| | *11 FYP Achieved* | -36.7 | N/A | -40.09** | -40.04 | N/A |
| | *12 FYP Target* | -30 | -25 | N/A | -30 | N/A |
| | *12 FYP Achieved* | -36 | -25 | N/A | N/A | N/A |
| | *13 FYP Target* | -20 | -10 | -11 | N/A | N/A |

Note: N/A means the data were not available. For example, the Weifang and Fangzi government websites were down in 2019.
* The COD target decided by the central level for Shandong province was -14.9%, but Shandong province set itself a higher target of -18.0%.
**This figure relates to large-scale enterprises rather than the province: It is used as a surrogate because industry represents the overwhelming share of emissions in Shandong.

| **Economic Target** | | **National** | **Shandong Province** | **Weifang Municipality** | **Fangzi County** | **Zucheng County** |
|---|---|---|---|---|---|---|
| GDP growth rate (%) | *11 FYP Target* | 7.5 | 10 | 12 | 16 | 16 |
| | *11 FYP Achieved* | 11.2 | 13.1 | 14.2 | 12.5 | 15.1 |
| | *12 FYP Target* | 7 | 9 | 12 | 13 | 15 |
| | *12 FYP Achieved* | 7.7 | 9.4 | 9.9 | 10 | 10.9 |
| | *13 FYP Target* | 6.5 | 7.5 | 8 | 8 | 8 |

*Source: Data gathered by the authors from local policy documents.*

Table A3: Targets Trickling Down from Provincial to County Level: Hunan

| **Environmental Targets** | | **National** | **Hunan Province** | **Chenzhou Municipality** | **Rucheng County** | **Suxian County** | **Zixing County** |
|---|---|---|---|---|---|---|---|
| Energy intensity (%) | *11 FYP Target* | -20 | -20 | -20 | -20 | -20(-18) | -20 |
| | *11 FYP Achieved* | -19.1 | -20.43 | -21 | -20.2 | -7** | N/A |
| | *12 FYP Target* | -16 | -16 | -18 | -16* | -18 | -22 |
| | *12 FYP Achieved* | -18.4 | -21 | -21.1 | -12.4 | -30 | -30.1 |
| | *13 FYP Target* | -15 | -16 | -17 | -16 | -18 | -18 |
| Water: COD (%) | *11 FYP Target* | -10 | -10 | -10 | N/A | N/A | -40.1 |
| | *11 FYP Achieved* | -12.45 | N/A | N/A | N/A | -7 | -40.1 |
| | *12 FYP Target* | -8 | -8 | -8.5 | -8.5 | -10 | -10 |
| | *12 FYP Achieved* | -12.9 | -9.9 | -8.25 | N/A | N/A | -8.17 |
| | *13 FYP Target* | -10 | -10.1 | -10.5 | - 8 | -15 | -15 |
| Air: $SO_2$ (%) | *11 FYP Target* | -10 | -10 | -10 | N/A | N/A | -10.3 |
| | *11 FYP Achieved* | -14.29 | N/A | N/A | N/A | -8 | -10.3 |
| | *12 FYP Target* | -8 | -8 | -8.3 | -8 | -8.7 | -10 |
| | *12 FYP Achieved* | -18 | -16.1 | -10.72 | N/A | N/A | -10 |
| | *13 FYP Target* | -15 | -21 | -13 | -2 | -30 | -25 |
| Air: NOx (%) | *11 FYP Target* | No target | No target | No target | No target | No target | No target |
| | *11 FYP Achieved* | No target | No target | No target | No target | No target | No target |
| | *12 FYP Target* | -10 | -10 | -10 | +15 | -18 | -10 |
| | *12 FYP Achieved* | -18.6 | -17.7 | -39.45 | N/A | -8.5 *not met* | -39.91 |
| | *13 FYP Target* | -15 | -15 | -20 | -2 | -40 | -40 |
| Water: NH4 (%) | *11 FYP Target* | No target | No target | No target | No target | No target | No target |
| | *11 FYP Achieved* | No target | No target | No target | No target | No target | No target |
| | *12 FYP Target* | -10 | -10 | -9 | -8.5 | -8 | -10 |
| | *12 FYP Achieved* | -13 | -10.8 | -4.85 | N/A | N/A | -8.9 |
| | *13 FYP Target* | -10 | -10.1 | -10.1 | -8 | -15 | -15 |
| Forestry coverage (%) | *11 FYP Target* | 20 | 55 | 65 | 70 | N/A | 75 |
| | *11 FYP Achieved* | 20.36 | 57 | 63.65 | 73.69 | 66.1 | 67.3**** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | *12 FYP Target* | 21.66 | >57 | 65 | 75 | 67.5 | 72 |
| | *12 FYP Achieved* | 21.66 | 59.57 | 67.71 | 71.2 | 67.95 | 75.81 |
| | *13 FYP Target* | 23 | >59 | 68 | 75.06 | 68.30 | 75.6 |
| Water consumption per unit of industrial value added (%) | *11 FYP Target* | -30 | N/A | -44 | N/A | N/A | -2%per year |
| | *11 FYP Achieved* | -36.7 | N/A | -44.47 | N/A | N/A | N/A |
| | *12 FYP Target* | -30 | -30 | -30 | -30 | -30 | -3%per year |
| | *12 FYP Achieved* | -36 | -51.6 | -10.1 | N/A | N/A | N/A |
| | *13 FYP Target* | -20 | -25 | N/A | N/A | N/A | -20 |
| Note: N/A means the data were not collected, although they might be available. "No Target" shows that no target was set.<br>*Target for large-scale enterprises.<br>**A new company, Huaren, relocated to the Suxian county in 2007. After Suxian lodged a complaint, its energy intensity target was lowered from -20% to -18%.<br>****Target was not fulfilled because of a freezing rain disaster in 2008. | | | | | | | |
| **Economic Target** | | **National** | **Hunan Province** | **Chenzhou Municipality** | **Rucheng County** | **Suxian County** | **Zixing County** |
| GDP growth rate (%) | *11 FYP Target* | 7.5 | 10 | 12 | 12 | 13 | 12.5 |
| | *11 FYP Achieved* | 11.2 | 14 | 11.6 | -3.5 | -14.2 | 15.5 |
| | *12 FYP Target* | 7 | >10 | 13 | 15 | 17* | >15 |
| | *12 FYP Achieved* | 7.7 | 10.5 | 12.2 | 11.4 | 12.02 | 12.3 |
| | *13 FYP Target* | 6.5 | 8.5 | 9 | 10.5 | 9.5 | 9 |

*Source: Data gathered by the authors from local policy documents.*

Table A4: Targets Trickling Down from Provincial to County Level: Jiangsu

| **Environmental Targets** | | **National** | **Jiangsu Province** | **Yancheng Municipality** | **Dafeng County** |
|---|---|---|---|---|---|
| Energy intensity (%) | *11 FYP Target* | -20 | -20 | -20 | -20 |
| | *11 FYP Achieved* | -19.1 | >-20 | -17.9 | -19.89 |
| | *12 FYP Target* | -16 | -16 | -17 | -18 |
| | *12 FYP Achieved* | -18.4 | -23.8 | -20 | -20 |
| | *13 FYP Target* | -15 | -17 | -18 | N/A |
| Water: COD (%) | *11 FYP Target* | -10 | -10 | -10 | -10 |
| | *11 FYP Achieved* | -12.45 | -12.8 | -11 | -10.5 |
| | *12 FYP Target* | -8 | -11.9 | -9.56 | -11 |
| | *12 FYP Achieved* | -12.9 | -16.22 | -12.6 | N/A |
| | *13 FYP Target* | -10 | -13.5 | ≥-12.8 | -20 |
| Air: $SO_2$ (%) | *11 FYP Target* | -10 | N/A | N/A | N/A |
| | *11 FYP Achieved* | -14.29 | N/A | N/A | N/A |
| | *12 FYP Target* | -8 | -14. 8 | -6.47 | -7 |
| | *12 FYP Achieved* | -18 | -19.15 | - 6.61 | N/A |
| | *13 FYP Target* | -15 | -20 | ≥-18 | -20 |
| Air: NOx (%) | *11 FYP Target* | No target | No target | No target | No target |
| | *11 FYP Achieved* | No target | No target | No target | No target |
| | *12 FYP Target* | -10 | -17.5 | -6.3 | -7 |
| | *12 FYP Achieved* | -18.6 | -20.45 | -11.81 | N/A |
| | *13 FYP Target* | -15 | -20 | ≥-18 | -20 |
| Water: NH4 (%) | *11 FYP Target* | No target | No target | No target | No target |
| | *11 FYP Achieved* | No target | No target | No target | No target |
| | *12 FYP Target* | -10 | -12.9 | -10.78 | -11 |
| | *12 FYP Achieved* | -13 | -13.34 | -10.81 | N/A |
| | *13 FYP Target* | -10 | -13.4 | ≥-12.63 | -20 |
| Forestry coverage (%) | *11 FYP Target* | 20 | 20 | 20 | 20 |
| | *11 FYP Achieved* | 20.36 | 20.6 | 19 | 15.9 |
| | *12 FYP Target* | 21.66 | 22 | 23 | 23 |
| | *12 FYP Achieved* | 21.66 | 22.5 | 22 | 27.77 |
| | *13 FYP Target* | 23 | 24 | 26 | ≥24 |
| Water consumption per unit of industrial value added (%) | *11 FYP Target* | -30 | N/A | N/A | N/A |
| | *11 FYP Achieved* | -36.7 | N/A | N/A | N/A |
| | *12 FYP Target* | -30 | -25 | N/A | N/A |
| | *12 FYP Achieved* | -36 | -32 | N/A | N/A |
| | *13 FYP Target* | -20 | -25 | -14 | -20 |
| Note: N/A means the data were not available. Dafeng did not publish its 13th FYP. | | | | | |
| **Economic Target** | | **National** | **Jiangsu Province** | **Yangcheng Municipality** | **Dafeng County** |
| GDP growth rate (%) | *11 FYP Target* | 7.5 | >10 | N/A | N/A |
| | *11 FYP Achieved* | 11.2 | 13.5 | 13.9 | 14.5 |
| | *12 FYP Target* | 7 | 10 | >13 | >14 |

| | | | | | |
|---|---|---|---|---|---|
| | *12 FYP Achieved* | 7.7 | 9.6 | 11.9 | 7.3 |
| | *13 FYP Target* | 6.5 | 7.5 | 10 | 7.5 |

*Source: Data gathered by the authors from local policy documents.*