Environmental Governance in China:
Centralization of Local Environmental Policy in the Prevention and Control of Air Pollution in Key Regions plan

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Abstract
The purpose of the thesis is to showcase the affect environmental policy has on the central-local relations in contemporary China. The thesis argues that the central government is centralizing control of environmental policy by the use of the Prevention and Control of Air Pollution in Key Regions plan (Prevention Plan). The Prevention Plan introduces policies to enhance cooperation on a regional level to prevent and control air pollution and a more stringent control of infrastructure development in a select group of cities, so called city clusters. However, the plan does not address the implementation problems in terms of improving the ability of local governments to prevent and control air pollution themselves, rather the plan aims towards a more top down approach of implementation. The thesis will analyse the policies of the Prevention Plan through the use of the theory, de facto federalism. The theory will operationalize environmental policy into central-local relations and provide a framework in which the Prevention Plan can be understood. The thesis will also use secondary data to showcase the results of the policies in the Prevention Plan, therefore the methods used in the thesis are a case study longitudinal design to analyse the local governments included in the Prevention Plan.

Key words: centralization, environmental policy, local government, central government, centre, China.
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1. Introduction

In the wake of China’s rapid economic growth these past three decades, China has been experiencing increasing environmental problems, in fact the situation is so bad that China is ranked 128 out of 132 of the world’s worse polluted countries according to the Yale’s environmental performance index of health impacts from air pollution. (Economy, 2014)

Therefore, air pollution is one of the biggest challenges in contemporary Chinese politics. (Shao et. al., 2006)

Every five years the State Council outlines a so called Five Year Plan (FYP) which sets the directives that the central government wants the local governments to fulfil with relevant supporting policies. The recent 12th FYP has emphasised the improvement of air quality like no other FYP before it, which includes significantly revised laws and regulations to increase the authority of national and local environmental protection institutions as well as to increase accountability of local governments on environmental protection. One of the main sub-plans in the 12th FYP is the Prevention and Control of Air Pollution in Key Regions Plan (Prevention Plan) which provides extensive environmental regulations to specific key regions that are especially polluted. However because of fragmented governance and weak rule of law, in combination with economic growth taking precedence over environmental protection, implementing environmental policy in the provinces is one of the great challenges towards effective environmental regulation.

Since the main goal of the Prevention Plan is to prevent and control air pollution, the Plan introduces several measures and policies on how to do so, but the main features of the Plan involves controlling air pollution in specific key regions. As such, the Prevention Plan introduces policies to enhance regional cooperation and to classify certain city governments for more stringent requirements for air pollution control. The Plan tries to accomplish this through a top down approach, which means that local governments are accountable to set their own emission targets and to develop policies relevant to those goals. If city governments would fail to meet the air quality standards set by the Prevention Plan the local governments would lose some autonomy on environmental policy making in the future.

The thesis argues that these measures are part of a goal by the central government to centralize environmental policy decision-making. Therefore the thesis will analyse the measures of the Prevention Plan, as well as to determine the success or failure of the Prevention Plan by the use of environmental information disclosure data from the Pollution
Transparency Index (PITI) to empirically prove its case. Since it is the responsibility of the local governments to provide this data to the local environmental protection institutions, the amount of data disclosed will reflect the effectiveness the Prevention Plan have had on local environmental protection, and therefore give us an idea of the possibility that the central government is centralizing power. Thus, the thesis is a case study with a longitudinal design to analyse the local governments included in the measures of the Prevention Plan between 2011 and 2014.

The thesis is divided into three parts. Firstly, the literature review will introduces the environmental challenges in contemporary China as well as an introduction to Chinese environmental governance. Secondly, the thesis will operationalize environmental policy in central-local relations theory and provide a framework in which the Prevention Plan can be understood. Thirdly, the data will be presented and analysed to conclude whether the Prevention Plan has been successful in preventing and controlling air pollution.

1.1 Research problem

Because local governments have autonomy on environmental policy making, the centre tries to control local government behaviour by evaluating the performance of the local officials. Therefore, for the central government to be able to implement environmental policies locally they need the cooperation of the local officials. The Prevention Plan includes several policies which need to be implemented locally but tries to avoid depending on local government compliance. However, according to the policies of the Prevention Plan, more stringent environmental regulations and regional cooperation is the main features of the Plan, (IGES policy report, No. 2013-02) which means that the Plan needs the compliance of the local officials to prevent and control air pollution.

The problem is that the consequence of not meeting the air quality standards is not relevant to the local officials, meaning their performance evaluation is only marginally affected by poor environmental enforcement. In a hierarchical society as contemporary China, the heads of institutions control the general direction of the organisation, in this case the local government. Therefore because the Prevention Plan punishes the local government as an administrative unit and not the local officials running the local government, the thesis argues that the central government is aiming to centralize authority of local environmental policy. The thesis aims to prove this by analysing the result of the Prevention Plan, as well as its measures, in preventing and controlling air pollution.
1.2 Hypothesis

The thesis hypothesises that; because the Prevention Plan does not incentives local officials to comply with the measures of the Prevention Plan, the central government uses the Plan to centralize authority of local environmental policy.

1.3 Research question:

1. How have environmental policy affected central-local relations in China?
2. Why does the Prevention Plan ignore compliance of local officials in implementing environmental policy on the local government level?
3. Literature review

Air pollution has been the most debated and well documented environmental pollution in contemporary China. For instance, coal accounts for 70% of the total energy consumption in 2010 and emission from coal combustion are the major cause of air pollution in many regions in China. Furthermore, according to the World Bank, 16 out the worlds 20 cities with the worse air quality are located in China. (Chai et. al., 2014)

The most heavily polluted areas in China is concentrated into so called city clusters, city clusters are areas where small towns have sprung up around larger cities. These kinds of metropolitan areas exist in other countries as well but Chinese clusters tend to be much more concentrated and densely populated. For instance, the distance between cities is often less than 10 km in the Pearl River Delta region. Furthermore these clusters often constitute the bulk of the economic growth in China which results in high concentration of energy consumption in a small area. For instance, although the Pearl River Delta only account for 20% of the Guangdong province, 67% of the coal and 85% the oil consumed in the province is consumed in the Pearl River Delta city cluster. (Shao et. al., 2006)

The first serious involvement by the Chinese government in environmental protection occurred during the late 1970s in the form of economic reforms. The Environmental Protection Law was enacted in 1979, revised in 1989 and 2014, as of 2007 China has 20 environmental laws adopted and 140 executive regulations issued and a series of environmental standards at a national level. (Carter et al., 2007)

However, despite these measures the implementation of environmental policy and the enforcement of environmental regulations is still one of the biggest problems towards effective environmental protection in contemporary China. That is why the thesis will discuss the reason behind the implementation gap and what measure the centre use to incentives local officials to comply with central directives on environmental regulations. However, before that, the basic concepts of Chinese government structure will be introduced.

2.1 Government Structure

In the Chinese government system there is a clear and strict hierarchy on what level of authority every level of government has over the other. However sometimes local government responsibilities are overlapping and therefore it is important to clearly define between the different levels of government and its institutions.
Contemporary China is divided into seven administrative units from the highest to lowest; provincial level, prefectural, county, township and village, including sub levels on prefectural and provincial level. However in contemporary China, cities have been included in the administrative hierarchy, the so called city governments have been given larger authority to impose independent economic decisions in the provinces they reside in. There are four administrative levels of a city government, county level city, prefectural level city, sub provincial level city and provincial level. Depending on which level in the hierarchy the city inhibits the more power the city has to affect their economic development and also that of their subordinate administrative units. (Shen, 2007)

This means that there are two basic types of administrative units, one is the city type units and the other is area type units, for instance there is prefectural city unit and there are prefectural area unit (Ma, 2005). It is important to also note that for instance, a prefectural level city unit has much more administrative power than a prefectural area unit, which means that city governments is rather high in the administrative hierarchy. (Shen, 2007)

Provincial level is the highest authority among the local governments, but has limited influence over city governments. The central government (which includes the Chinese Communist Party, National People’s Congress and the State Council) is the highest authority in the country but with separate responsibilities, the State Council has executive administrative power in China, while the NPC is Chinas main legislative body. However even though formal power remains in the hands of the State Council the Chinese Communist Party has ultimately the greatest political power in China. (Luo et al., 2008) However, prefectural level cities will be the main analytical unit in the thesis, because they are the main executive bodies for enforcing environmental policies. (Qi et al., 2014)

To sum up, by local government the thesis refers to all the administrative levels under the central government including city governments unless the thesis explicitly refers to city governments. Because the prefectural level cities are the main executive body for enforcing environmental policy, city governments will refer to the prefectural level city units. When the thesis wants to refer to the central government, which includes the Chinese Communist Party, the State Council and the National People’s Congress, it will say the centre.
Furthermore, laws and regulations have a very complex framework in China. According to the 1982 constitution, the highest authority to enact basic laws, supervise the implementation of such laws and to make amendments to the constitution is the National People’s Congress. However despite the formal powers the National People’s Congress, the Chinese Communist Party has ultimately the greater power in contemporary China. Furthermore even though the National People’s Congress has the responsibility for all passage of national laws, other government authorities also has a wide range of law making powers. Alford et al. (2001) states that; “the State Council, Chinas chief administrative and executive body, is authorized to both enact administrative measures, rules, regulations and decisions pursuant to national laws and the constitution, and to submit legislative proposals to the National People’s Congress (Alford et al., 2001:708)”.

On a provincial and local level of governments there is the People’s Congress which can provide a wide range of local regulations, including local governments and government departments, provided they do not violate the national laws and the constitution. Consequently national laws are decided by the National People’s Congress, however other policies on a national level such as regulations and standards are issued by the State Council and its ministries. (Alford et al., 2001; IGES policy report, No. 2013-02)
Before 2008 there existed two national environmental Protection institutions, State Environmental Protection Administration (SEPA) and Ministry of Environmental Protection (MEP), which had overlapping responsibilities. However after the so called super ministry reforms in 2008, SEPA and MEP merged and became just MEP. Because of these reforms MEP was alleviated to super ministry status and received a cabinet level in the State Council. MEP therefore has the same authority as their economic counterparts, such as the Economic Commission and has direct authority to influence State Council decision making; “According to the Organic Law of the State Council Article 17, the State Council and its ministries at its cabinet level have the authority to decide major national economic and social development plans and the national budget (Qiu, 2008; 9)”. This means that MEP has the authority to influence economic decision making and thus be able to raise environmental concerns during development plans. (Qiu, 2008)

2.2 Power Relations in China

Since the Chinese government system is so hierarchical, it is impossible for lower level units to interact with the centre without going through the next step in the hierarchy. This administrative arrangement has not always been this way however. Prior to 1978 the Chinese political system was highly centralized, but since the early 1980s there has been a tendency towards decentralization. (Shen, 2007) According to Zheng (2007) the Chinese constitution stipulates that;

(...) all provincial governments are local state administrative organs, they must accept the unified leadership by the State Council, implement administrative measures, regulations and decisions by the State Council, and be responsible and report to the State Council. (Zheng, 2006; 103)

Meaning, the centre has overwhelming power in the decision making of society. (Shen, 2007) The State Council has the authority to define specific functions and powers of local governments and it also has the authority to nullify any decisions or laws proposed by them. This means that even though provincial People’s Congress (legislative branch of the provincial government) has the right to make local laws, the National People’s Congress (legislative branch of the centre) can annul them if they conflicts with national laws. (Zheng, 2006)
On a practical level however local governments have more autonomy than what the Chinese constitution stipulates, when the centre want to implement policies they have to rely on local bureaucracies and governments to implement them, however local interests are not always the same as national interests. This means that instead of the central-local relations being one sided, power is actually divided between two actors. (Zheng, 2006)

The central-local relations in China can be defined as the following;

1. Intergovernmental decentralization is institutionalized to such a degree that it is increasingly becoming difficult, if not impossible, for the national government to unilaterally impose its discretion on the provinces and alter the distribution of the authority between governments.

2. The provinces have primarily responsibility over the economy and, to some extent, politics within their jurisdiction.

Source: Zheng, 2006; 107

This means that local governments have control of economic development within their jurisdiction. When we speak of local autonomy in China there are certain limitations which local government have over the central government and vice versa. Some policy decisions are exclusively dictated by the local governments, which often concern economic matters, while some are dictated exclusively by the centre, such as foreign policy and national defence. (Zheng, 2006; Shen, 2007)

During the decentralizing reforms of the 1980s, the Chinese government has been very successful in boosting economic growth. The notion is that decentralization is more effective for economic growth than in a centralized structure because individual preferences of economic goods differ, thus it is difficult for the centre to provide economic policies that adapts to the preferences of local residences among the different provinces. Hence centralization is unlikely to happen on economic matters, but the paradox is that economic growth is often correlated with reduced air quality, at least in newly industrialized countries such as China. (Zheng, 2006)

Because the local governments have exclusive decision making rights on certain issues, the centre cannot directly control and enforce local environmental regulations. In fact, it is also stipulated by law that local governments have autonomy on environmental policy-making. According to the Air Pollution Prevention and Control Law (APPC Law) article 3; “the local
governments at various levels shall be responsible for the quality of the atmospheric environment under their own jurisdiction (…)"

Therefore it is necessary for the centre to implement policies that will control the behaviour of local officials in order to make them enforce the environmental regulations. The next section will explore environmental policy on a street level and what measures the centre use to control the behaviour of the local officials.

2.3 Local officials

According to the Environmental Quality Administrative Leadership Accountability System that was passed by the Central Committee of the Communist Party in 2006, the promotion and removal of local cadres (Local officials) has been directly linked to their environmental performance. According Hsu (2013); “Local leaders who fails to meet the targets for consecutive years is not eligible for promotion in the next five years (Hsu, 2013; 288)”. However because of the evaluation system, the impact of local cadres environmental performance is comparatively less than on for instance economic performance.

According to interviews by Hsu (2013), many provincial and local officials did not feel that there was any real consequence of not achieving the environmental targets. Furthermore the degree of institutionalization at the provincial and local levels fluctuate considerably, for instance different provincial and local environmental protection institutions has different systems on how to assess the environmental performance on their respective local cadres. In most of them, environmental performance only included a small percentage of the total performance evaluation. There are also other hindrances to incentivise local cadres to engage themselves on environmental issues, which will be explained below.

The following research is done by Eaton and Kostak (2014) which have collected empirical data from interviewing leading officials in Shanxi, Hunan and Shandong. In Eaton and Kostak (2014), the authors explain that cadres on county and municipal level (prefectural level) are rotated every five years, however more often than not the rotation are significantly shorter than that and to a lesser extent longer. Rotation often occurs in the context of promotion and much less frequently, demotion. Statistics show that since the 1990s the rotation of local officials has become more frequent, between 2002 and 2011 tenure length dropped to an average of 3.3 years from 4.2 years in the 1990s.

According to Eaton and Kostak (2014), one of the reasons for the rotations system is to place limits on local cadres and to discourage them to engage in localism; “This Churning of local
leaders is largely a legacy of the Deng-era leadership’s interest in strengthening the centre’s levers of control over the localities (Eaton; Kostak 2014; 362). The assumption is that if local leaders hold office in areas where they have no ties or origin and are frequently rotated, are less likely to favour local interests and to deviate from the goals set by the centre. Supposedly this system would also enhance monitoring since the new cadre would provide the central government with inside information on the predecessor’s reign.

Furthermore, Eaton and Kostak (2014) argues that; “while control and monitoring constitute the core aims of the rotation system, relevant policy documents now more often link cadre circulation to the broader mandate of rejuvenating the cadre ranks and strengthening the state’s leadership capacity (…) (Eaton; Kostak 2014; 363)”. However even though new supplementary aims have been added over the years, it does not change the fact that the core aim of the system is to monitor and to control local officials and that the turnover has increased in recent years. This means that we can draw the conclusion that even though local governments have extensive autonomy during their time in office, the centre also makes extensive indirect efforts to make sure that the local and provincial governments comply with central directives. However, as we have seen the measures have not been effective and local governments still prioritises economic growth over environmental protection because of the unclear evaluation procedures.

2.4 Environmental protests

Despite of the current efforts by the centre on environmental protection, it is only in recent years that the centre has properly reacted to them. Economic growth has been and still is the main political discourse in China and has therefore taken precedence over environmental protection. Because of the severity of the degradation and the weakness of the rule of law in contemporary China, environmental grievances often lead to environmental protests.

This lack of an effective institutional mechanism for the Chinese people to participate in the environmental policy-making process or to get redress through the legal system has translated into a vibrant environmental protest movement in China (Economy, 2014; 191)

The impact on environmental protests is no more evident than in Deng and Yang (2013) study, where 11 pollution factories in 2005 were forced of their land by farmers. In fact; “environmental ‘Mass incidents’ grew by an average of 29% annually from 1996 to 2011, and 120% from 2010 to 2011 (Balme et al., 2014; 4).”
In other relevant literature, one can find that environmental policy advocacy also has had an impact on government policy, at least on a local level. For instance, after a mountain of discontent as a result of increased air pollution in Beijing in May 2013, the Beijing government introduced the so-called, Action Plan for Air Pollution Prevention and Control, which is a comprehensive local plan to prevent and control air pollution. (Economy, 2014)

In 2000 the central government passed the Law of the People’s Republic of China on the Prevention and control of air pollution (APPC Law). By studying the law, one can see similarities between the policies of the Prevention Plan and the articles of the law, in fact the thesis argue that this is the legal basis for the Prevention Plan. However, as the plan was implemented in 2012, there is a large interval between the passing of the law and the implementation of the plan.

During my visit in Beijing at Beijing University, I had a professor which helped me by acquire all of my primary data. During our second meeting we came into discussion about this law and she took particular notice when I told her that I believed that the law was the legal basis for the Prevention Plan. She did not argue that this was not the case, rather she wanted to correct me about the word “legal basis”, this is a very western term she said, and explained to me that laws themselves does not have much substance in contemporary China. She argued that it is the political basis that gives substance to the enforcement of laws. The law was passed in 2000 and the plan was implemented in 2012, so why the large interval between the two? She argued that public pressure is the definitive reason for laws being planned into action. (Personal communication, 13 March 2015)

In other words, the APPC Law was drafted out of necessity from public pressure, and after a decade of growing environmental protests, the APPC Law was ready to be enforced through the Prevention Plan. So what is the significance of the Prevention Plan?

2.5 Prevention Plan

Before introducing the policies of the Prevention Plan, it is necessary to explain what a Five Year Plan (FYP) is and how it is related to the Prevention Plan.

The FYP is outlined every five years where ministries propose plans covering their related fields, within the FYP there are targets which central and local governments need to fulfil with relevant supporting policies. FYPs themselves are not laws, instead they provide guidance for government policies, and they sometimes establish a process to create new laws
and regulations or revise existing ones, but laws are also sometimes developed in conjunction with the FYP. (IGES policy report, No. 2013-02)

The reason that the thesis is not going into further details about the measures in the 12th FYP is because it is beyond the scope of the thesis, because new plans is being developed throughout the FYP period. Old laws, regulations, policies and sub-plans are being incorporated and revised, so the distinction between FYPs measures can easily become blurred.

One of the major sub-plans in the 12th FYP is the Prevention Plan, which makes additional efforts to prevent and control air pollution in the key regions by having stricter requirements for cleaner technology, reduce coal consumption etc. The Prevention Plan is a milestone in air pollution control in China because it is the first time the central government issues a comprehensive air pollution prevention and control plan. The main feature of the Prevention Plan is that city governments within the same city clusters shall coordinate in controlling air pollution instead of solely focusing on their own jurisdictions. The areas covered in the plan only covers 14% of the total area in China, but it contributes 71% of the country’s GDP and 52% of the country’s coal consummation, which makes these areas especially polluted. The fact that China is setting up strict limits on air pollution in these areas is significant because it indicates the willingness to sacrifice some growth for environmental protection. (CAAC policy briefing, 2012)

Some examples of policies where the Key Regions have more stringent environmental policy than the other regions:

1. *Stricter environmental thresholds, strengthen management at the source*
2. *Strict controls on high energy consumption and high pollution projects*
3. *Strict control on new pollutant emissions*
4. *Implementation of special emission limits*

Source: CAAC policy briefing 2012; 15-16

The reason for the adoption of the Prevention Plan is that local governments work separately from each other, and there are no established institutions on a regional level to prevent and control air pollution. Furthermore, the current laws and regulations lack effective measures to prevent and control air pollution as well as mobile pollution sources on a regional level. (CAAC policy briefing, 2012)
The regional cooperation measures in the Prevention Plan is divided into two different approaches, the top down approach where four regions, Beijing-Taianjin-Hebei, Yangtze River Delta, Chengdu-Chongqing and Ganning (Gansu and Ningxia) are to cooperate and establish working groups led by MEP, the bottom up approach entails that all the other administrative areas (Pearl River Delta, Central Liaoning province, Shandong province, Wuhan region, Changsha-Zhuzhou-Xiangtan, the West Bank of the Taiwan Strait, Gansu and Ningxia, Central and Northern part of Shanxi province, Central Shanxi province and Urumqi city cluster) should decide their own leadership. (IGES policy report, No. 2013-02)

In the event that local governments fail to follow the environmental standards, MEP has been given the authority to supervise a time plan for better policy decisions.

Municipalities which do not meet air quality standards will need to develop time limited plans to do so, and these should be open to the public. Compliance deadlines of municipalities directly under the central government should be approved by the State Council. Compliance deadlines for 113 national Key Environmental Protection Cities should be approved by the respective provincial governments and MEP, and the deadlines of other cities should be approved by their provincial governments and recorded by MEP. Implementation should be monitored by national and provincial environmental protection departments. (IGES policy report, No. 2013-02; 62)

This indicates that if municipalities (Prefectural cities) do not meet the air quality standards, MEP will have greater authority to make sure that they comply, which will strengthen the centre’s position in the provinces in the long run. Furthermore, the emphasis on accountability rests on the local government as a whole, rather than on the local official in charge at the time. (IGES policy report, No. 2013-02) As we have seen in the literature so far, is that, the hierarchal structure makes the local official of the local government the only person that can set the general directives of its administration. This means that, to make local governments comply with the Prevention Plan, the local officials needs to be incentivised to do so.

Nevertheless, according to the IGES policy report (2012); “many specific targets, policies and key projects are established to apply to both key regions and enterprises without the need for any voluntary cooperative measures among provinces and municipalities (IGES policy report, No. 2013-02; 63)”. This means that a lot of the policies and measures in the Prevention Plan increases the influence of the centre and favours a top down approach when handling environmental issues on a local level.


2.6 Policy Experimentation

As the thesis has shown thus far, the decentralized system in contemporary China can result in problems of local implementation. However, decentralization also opens up possibilities for controlled policy experiments on a local level before being implemented nationally. (Economy, 2014) It is highly possible that the Prevention Plan is just an experiment, rather than a fully developed national plan.

In the article Heilmann (2008) the author identifies a concept called experimental hierarchy, which stipulates that the Chinese government system makes it easier to test policies before it being finalized on a larger scale. According to Heilmann (2008) policy experimentation in China is not a mere trial and error process, the experiment is delegated from the centre and implemented by local officials which are then coordinated by the centre to generate; “(…) policy option that are injected into official policymaking and then replicated on a larger scale, or even formally incorporated into national law (Heilman, 2008; 3)”.

However, one could argue that the Prevention Plan is much too large in scale to be considered a controlled environment to which policy can be tested. Fortunately Heilmann (2008) provides us with examples of past policy experimentations by which we can compare the Prevention Plan with. There are three main approaches in policy experimentation in China; experimental regulation, experimental points, and experimental zones. The most applicable approach for this thesis is the experimental zones, experimental zones are; “(…) geographical units and jurisdictions that are provided by the central authorities with broad discretionary powers (Heilmann, 2008; 7)” The Prevention Plan is by definition divided into geographical zones specifically aimed at preventing and controlling air pollution, therefore it is highly likely that the Plan is part of an experimental zone approach by the centre. An example of an experimental zone is the special economic zones, which were allowed to draft and to enact their own legislation. However, the difference between an experimental zone aimed at economic growth and the Prevention Plan cannot be overlook. For instance, the Shenzhen Special Economic Zone (SEZ) were allowed special freedoms in dealing with land auctions, wholly foreign-owned companies or labour market liberalization, which were restricted in the rest of China at the time. Thus the comparison becomes difficult because whereas the Prevention Plan aim to restrict policies developed in the key regions, the SEZ was aimed at allowing more freedoms in policy development. (Heilmann, 2008)
Special Economic Zones is therefore a case of decentralization, while the Prevention Plan is arguable a case of centralization, however, as discussed earlier in the thesis, the Plan has two approaches one is top down and the other is bottom up approach, which indicates that there is centralization as well as decentralization. Considering China’s past tendency of policy experimentation it is possible that the Prevention Plan is just an experiment for larger reforms to come. One of the clues that may indicate experimentation, is the Prevention Plan was initiated by the centre and even though the bottom up regions are left to decide their own leadership, the standards and policies are still set by the centre (Heilmann 2008).

However, the question is how much sponsorship and advocacy do these regions receive to formulate their policy? If the local governments do not receive support during the cooperation process then it may indeed prove that the Prevention Plan is full blown national policy and not an experiment. According to Heilmann (2008); “In a hierarchical system, bottom up experimentation goes nowhere without higher –level patrons or advocates (…) (Heilmann 2008; 9)”. What can be found in the Prevention Plan is that involvement from the centre only occurs in the top down approach regions and even though there is regional management mechanism proposed, the responsibility of implementing them lays with the respective regional working groups, which is decided by themselves in the bottom up approach regions.

However, the fact that there are different approaches may also be an indication that the centre is experimenting on which approach is more successful. Furthermore as Heilmann (2008) points out; “experimental policy tools continue to be used for pioneering reforms that belong to the top of the policy agenda (Heilmann, 2008; 9)”, which environmental policy surely is. Indeed, if the Prevention Plan can be considered a policy experiment, then it shows that there may be experimentation aimed at centralizing power as well as decentralizing it. However, Heilmann (2008) argues that because local governments are sometimes leaders of policy reforms as well as followers; “the entire policy process must be conceptualized as an oscillating multilevel interaction rather than as a dichotomized process of centralization vs. decentralization. (Heilmann, 2008; 5)”. Therefore the Prevention Plan may not be considered as to either centralize or decentralize but as a multilevel interaction between different levels of government and other stakeholders.
2.7 Pollution Information Transparency Index

The thesis will analyse the Pollution Information Transparency Index (PITI) data to empirically prove its case. The data will provide the thesis with the score and ranking of the sample of cities on their performance in environmental disclosure requirements. Therefore this section will explore the evaluation criteria of the different reports.

PITI was developed by the Institute of Public and Environmental Affairs (IPE) which is a non-profit organisation based in Beijing and Natural Resources Defence Council (NRDC), a non-profit international environmental advocacy group based in New York.

The reason for the thesis not simply using air pollution statistics is that air pollution has a multitude of variables to consider, such as what type of pollution should be analysed, how does particular pollution react according to the seasons and weather in each region, how much pollution is produced outside the region. Furthermore when one type of pollution is being reduced it may cause the increase in another, which is beyond the scope and outside the theme of the thesis. (Chia, 2014)

Since 2008, the evaluation criteria on the PITI reports have been the following:

1. Records of enterprise violation (28 pts)
2. Result of enforcement campaigns against pollution facilities (8pts)
3. Clean production audit information (8 pts)
4. Enterprise environmental performance ratings (8 pts)
5. Disposition of verified petitions and complaints (18 pts)
6. Environmental Impact Assessment: reports and projects completion approvals (8 pts)
7. Discharge fee data (4 pts)
8. Response to public information requests (18 pts)

Source: PITI report 2008

Total of 100 points, the higher score the better.

However in 2013 the criteria changed and was updated in accordance with the new and revised environmental laws and regulations, for instance that environmental information disclosure has been established by law and that MEP requires real time disclosure of online pollution-source monitoring data, which various provinces have been able to achieve.
The new criteria;

(1) Publication of excessive emissions and other violation records (23 pts)
(2) Enterprise environmental performance assessment (5 pts)
(3) Publication of emission fees (2 pts)
(4) Disclosure of online monitoring information (20 pts)
(5) Petitions and complaints (7 pts)
(6) Disclosure upon application (8 pts)
(7) Disclosure of key enterprise emission statistics (16 pts)
(8) Publication of clean production audit information (4 pts)
(9) Environmental impact information (15 pts)

Source: PITI report 2013-2014

Compared to the old criteria, the new criteria have more emphasis on the disclosure of data rather than to look specifically for violations. For instance, now the score is based on whether the local governments disclose such data, not whether such violations occur. The standard is still based on China's pollution-source monitoring information and disclosure system however. This has led to a significant drop in average score in the 2013-2014 report, one of the reasons for the sharp drop in PITI scores is because of independent monitoring of air quality, which makes it easier to detect inconsistencies of local government reports. Another reason, as shown above, the criteria is much stricter concerning reports on environmental impact information and the disclosure of key emission statistics (PITI, 2013-2014)

As stipulated in the latest PITI report (2013-2014), the change in indicators occurred because data is more accessible than in the past and several laws has been revised to enhance environmental information disclosure. One such law is the newly revised (2014) Environmental Protection Law (EP Law), for instance, according to article 47; “The people’s governments at and above the county level shall establish public monitoring and early warning mechanisms for environmental pollution, organize the development of early warning plans (…)”, which requires local governments by law to increase environmental monitoring. The law also include local environmental protection institutions and MEP to increase monitoring and disclosing environmental information. According to article 53; local environmental protection institutions “(…) shall, according to the law, disclose environmental information (…)”; article 54, MEP “(…) shall release information on environmental quality
and the monitoring of key pollution sources (…); local environmental protection institutions (“…) shall, according to the law, disclose information on environmental quality (…)

According to article 68; Where a local people’s government at any level or the environmental protection administrative department or any other department with environmental protection supervision and administrative functions of a people’s government at or above the county level commits any of the following acts, the directly liable person in charge and other directly liable persons shall be subject to a demerit, a major demerit or demotion; and if the consequences are serious, they shall be removed from office or expelled, and the primary person in charge thereof shall resign to assume the responsibility for the act. This includes (1) “altering or forging monitoring data or instigating others to do so; (2) Failing to disclose environmental information as otherwise legally required.” (EP Law)
3. Central-local Relations Theory

The thesis will showcase the effects environmental policy has had on central-local relations by analysing the Prevention Plan through central-local relations theory. The theory will operationalize environmental policy into central-local relations as well as to provide a framework within which the prevention Plan can be understood and the research findings can be interpreted (Bryman, 2008).

According to Zheng (2007), the theoretical discussion about central-local relations in China can be divided into three approaches; i.e. the structural approach; the procedural approach; and, the cultural approach. The structural approach examines the formal structure of the Chinese system while the procedural approach focuses on how the system works on a behavioural level. The cultural approach on the other hand is a more abstract approach that uses culture to explain the relationship and behaviour between the centre and the local governments, therefore, not a lot of attention will be given to this approach. According to Zheng (2007) to understand central-local relations one must make use of all three approaches, or in this thesis case, the first two approaches, and since the thesis is going to use the authors theory of de facto federalism, the thesis will make a short summery of the different concepts and how it is related to the thesis.

3.1 Structural Approach

The structural approach involves three different models that focus on different level of government. The totalitarian model views central-local relations from perspective of the centre, while the pluralist model views central-local relations from the perspective of the provinces. The cellular model on the other hand emphasises a balance between both.

The totalitarian model is based on the concept that the local governments are agents of the centre and follow the directives of the centre to the letter. The explanation for decentralization occurring is that the centre allowed it to happen and that the centre could just as easily recentralize again if they wanted to. It is also generally believed, among the totalitarians model advocates, that; “general policies were formulated at the centre, but provinces were allowed flexibility in their implementation (Zheng, 2007: 9)”.

The pluralist model on the other hand, stipulates that local governments plays an essential part in the central policy making process and is not just agents of the centre. They argue that the centre provides the local governments with general directives in which they have the flexibility to adapt to the regional conditions of their jurisdiction. In Zheng (2007), according
to the pluralist model; “(...) the power of the provincial government comes from the very fact that, due to great diversities among different provinces, the central government is not able to make a decision applicable to all regions (Zheng, 2007; 12)”.

According to the Cellular model, the interaction between the centre and provinces are not following a formal organisational formula because the centre is not always able to get policies implemented in the provinces. Hence, on an operational level, there is a balance between the centre and the provinces and decentralization was an inevitable process. According to the cellular model; “policies made in Beijing bear little resemblance to the reality at lower levels. There is a great concentration of power in the hands of provincial-level officials and leaders of lower-level units (Zheng, 2007; 15)”

Zheng (2007) argues that; “(...) local governments does have autonomy in its decision-making, but its decision-making process is constrained by given institutional conditions (Zheng 2007; 13)”. Basically the centre has an institutional advantage in the power relation because they provide institutional settings in which local governments behave, at least according to the structural approach. A common theme in the structural approach is the overemphasis on how various economic factors affect central-local relations. Zheng (2007) argues that, economic indicators is an imperfect measurement of the relative powers between the central and local government, thus fiscal indicators is insufficient to address issues such as implementation problems.

**Procedural Approach**

The procedural approach is more appropriate to explain implementation issues and the approach has one model, the fragmentation model. The fragmentation model simply stipulates that local governments increase influence in economic decision-making and that no single body has authority over the other, resulting in fragmentation of authority. In other words, the procedural approach does not consider the centre helpless relative to the power of local governments, and still acknowledges the relative autonomy of the provinces. This allows us to see how central-local conflicts are produced and how they are resolved. According to Zheng (2007), “the procedural approach regards central-local relations as the function of discrete strategic interaction between the centre and the provinces to achieve consensus (Zheng, 2007; 23)”.

Zheng (2007) argues that all three approaches are necessary to properly understand the central-local relations in China. However, for the purposes of the thesis, only the first two is
considered because the cultural approach is too abstract to be analytically useful, for instance the political culture in China and the values it creates. Therefore the thesis argues that institutional arrangements dictate the behaviour of local governments, while simultaneously emphasises the importance in analysing through the perspective of both the centre and the provinces.

**De Facto Federalism**

In most relevant literature, the fiscal indicators are over emphasized in central-local relations theory, and because the thesis is looking at central-local relations through environmental indicators, the researcher believe that the thesis will be able to contribute to central-local relations discussion when making use of Zheng (2007) de facto federalism.

De Facto Federalism argues that there are three zones in central-local relations, two of which already explained in the literature review. The power is divided between the centrally dictated zone where the centre have exclusive decision-making power; mainly political issues concerning the country as a whole, and the locally dictated zone where the local governments have exclusive decision-making power on local policies; mainly on economic and environmental issues. However, Zheng (2007) also argues that there is an overlapping and bargaining zone where the power is shared and policies are made by the centre, but implemented by local governments.
The thesis argues that environmental policy inhibits the bargaining zone and that the centre aims to move environmental policy to the centrally dictated zone through centralization. The thesis have so far discovered that the policies of the Prevention Plan favour the top down approach, therefore the thesis argues that the centre wants to eliminate local government involvement on environmental policy as much as possible. The main warrant for this is that the Prevention Plan introduces accountability measures while simultaneously not change the behaviour of local governments on environmental protection.

In Qi and Zhang (2014), the authors provide an institutional analysis that focuses on the central-local institutional arrangements. Qi and Zhang (2014) argue that; “(...) the actions of the agency are a reflection only to its supervising body (Qi et al., 2014; 205)”. In the case of the thesis, it means that the actions of the local governments are a reflection of the centre, meaning the centre can control the behaviour of local governments, through the institutional environment. Thus the centre provides constraints as well as incentives to control the behaviour of local government. According to Qi and Zhang (2014); “an incentive is simply a reward – a positive feedback (payoff) – while constraints limits the move for action (it defines the space of choices of the local governments) (Qi et al., 2014; 206)”. Thus the thesis argues that the Prevention Plan does not provide any additional incentives, as well as constraints to allow effective local environmental enforcement.
4. Methodology

4.1 Epistemology and ontology
I do not adopt to the positivist notion that knowledge can only be confirmed by the senses, rather, knowledge that does, enhance research that also applies theory into its argumentation. For instance, I reject the notion that research can be value free, because the very instant a topic is chosen, the thesis sees to be fully objective. Therefore it is important to make perfectly clear your intentions of doing the research. In the example of this thesis, I chose this topic and country because I find the Chinese government system fascinating and that upon reading about environmental protests and civil society in the People’s Republic of China, I believe that environmental issues have had and will have a great impact on Chinese governance in the future. (Bryman, 2008)

Therefore the thesis uses the epistemological notion of critical realism, for instance, the research questions will be answered both empirically and through theory, thus there is a positivist and an interpretivist model. The empirical answer will constitute of the environmental information disclosure data and will answer whether the Prevention Plan has been successful in its intended purposes and whether the Prevention Plan is centralizing power or not. While the theory will answer the underlying reasons for the policies in the Prevention Plan. Furthermore, though economic growth discourse has been the main political discourse in China, it is changing which can be seen by the various reforms presented in the thesis, therefore the researcher employ the ontological consideration of constructivism. (Bryman, 2008)

4.2 Research design
The thesis is going to do a case study research to make a comprehensive analysis of the Prevention Plan and, as the thesis is going to use the PITI reports to do a secondary data analysis from the years 2011 to 2014 to find the change in between those years, the thesis is also going to employ a longitudinal design. (Bryman, 2008; Yin, 2009)

4.3 Primary data
The thesis will use official policy reports and legal documents to analyse the Prevention Plan and its relevant laws and environmental institutions. Contrary to the references found in the bibliography, (Cf. e.g. APPC Law; Prevention Plan; EIA Law; EP Law) the legal documents are original documents from the standing committee of the National’s People’s Congress, both in Chinese as well as English, which is not available online. As well as a copy of the
original policy report on the Prevention Plan from the State Council. Unfortunately, this particular document is in Chinese, thus only the exact cities that are included in the Key Regions as well as its respective city clusters has been translated.

4.4 Secondary Data
The thesis began by generating a hypothesis from the subject of Chinese governance and air pollution, which then led to the testing of said hypothesis through a secondary data analysis. The secondary data analysis includes the environmental information disclosure data from the PITI reports which will be later tested empirically. The data involves the inclusion of 65 cities that are both included in the Key Regions Plan of the Prevention Plan, as well as in the Key Cities Plan of the APPC Law (incidentally the PITI report is based on the Key Cities Plan).

The thesis will analyse the data over time between 2011 and 2014, hence the research strategy employed in this thesis is considered to be a quantitative research strategy. (Bryman, 2008)

The sample will involve the same cities each year, the thesis will study the ranking of each city and the change that occur between them to analyse the cities change in environmental information disclosure overtime by considering the implications of the Prevention Plan. The change in ranking in the sample of cities will be analysed between 2011-2012 and 2012-2013 (and 2014) to make an assessment on how the change illuminates the success or failure of the Prevention Plan in preventing and controlling air pollution. Therefore, the Prevention Plan is the independent variable and the city governments are the dependent variable.

The sample of 65 cities is based on PITI reports sample of 120 cities, which is based on the Key Cities plan in the APPC Law, as well as the Prevention Plan, which is a different plan that designates 113 cities for environmental protection. Only 65 of the Prevention Plan´s cities are included in the PITI report, therefore only those 65 will be analysed, further details about the sample of cities will be provided later in the thesis.

4.5 Limitations
With the secondary data there are validity issues, one being the change in indicators already explained earlier in the thesis. The PITI report changed the indicators in 2013 which is the reason why 2013 and 2014 is evaluated simultaneously. As a result, the scores declined drastically among all the cities, which meant that the score was no longer comparable over time. Furthermore, the thesis started before the English translation of the 2013-2014 PITI report was finished, therefore the change came as a surprise for the researcher, and had to
make due of what was available, meaning that the ranks of each city would be assessed instead of their score.

4.5.1 Internal Validity

Nevertheless, just the fact that all the cities in the PITI report have reduced their score because of the change in indicators validates the thesis argument even further. According to the 2013-2014 PITI report, the areas that most cities failed in and is indeed the reason for the sharp drop in average score, is the disclosure of emission data from key enterprises and Environmental Impact Assessment (EIA) information, which accounts for 12.7% and 5% respectively by all the 120 cities. Therefore, regardless of the ranking of the cities, this statistic alone signifies a major lack of key environmental data. (PITI 2013-2014)

Furthermore, to improve the internal validity, the thesis has provided a counter argument to the hypothesis of the thesis. As explained in the literature review, it is possible that the Prevention Plan is a policy experimentation and the fact that there are both centralizing and decentralizing measures in the Prevention Plan may indicate that the Plan is doing neither, which would explain the lack of reforms in the behaviour of local governments towards environmental protection. (Yin, 2009)

4.5.2 Construct validity

There are also shortcomings in the thesis specific measures, for instance, the thesis does not have multiple sources of evidence, though the thesis have access to the various laws relevant to the measures of the Prevention Plan, the thesis does not have any other source of data on environmental information disclosure than the PITI report. (Yin, 2009)

4.5.3 External validity

As in most case studies, there are some issues of external validity, for instance, the thesis generalise a conclusion about all the 113 cities in the Prevention Plan even though only 65 cities is included in the PITI sample of 120. However, as the thesis will later argue; because the 65 cities in the sample are included in the Key Cities Plan (PITI report) as well as the Prevention Plan, validates the case sample. The plans were established for different reasons which make these particular cities both politically sensitive and important for both economic and international reputation reasons. This will be discussed in greater detail in the analysis chapter. This however makes replication impossible since the data is limited to these 65 specific cities and cannot be tested outside this specific case. (Yin, 2009)
Furthermore, though there are some concerns about the ability of case study research to generalise outside the single case, the thesis argues that there is a difference between generalising environmental information data and generalising the results into a broader theory. Yin (2009) provides an example between survey research which relies on statistical generalisation; “in which a sample is intended to generalise to a larger universe (Yin 2009: 43)”, and analytical generalisation. Analytical generalization is about generalizing a set of results into a broader theory, meaning in this case, that the Prevention Plan might be unsuccessful in preventing and controlling air pollution because the centre avoids local government interaction instead of changing its behaviour.

The biggest weakness in validity is however the fact that the source of the secondary data comes from an NGO, the researcher have to consider the possibility that the motives of the NGO might be less than honourable, and that corrupt intentions may influence the final result of the reports, even though it is a non-profit organisation. (Yin, 2009)

4.5.4 Reliability

The sample of cities is decided by the cities represented in the Prevention Plan and those cities that are included in the PITI report. To know the cities of the Prevention Plan one needs access to the official plan from State Council, the PITI report on the other hand is available online for anyone to access. Thus data collection is repeatable, though the data can be interpreted differently. (Yin, 2009) Furthermore, the reliability is a given, considering that the thesis is doing a longitudinal case, thus the stability of the measure has already been tested and retested. (Bryman, 2008)
5. Empirical Data

The pollution transparency index (PITI) provides data annually on environmental information disclosure, and since it is the responsibility of local governments to disclose such data, the thesis argues that the PITI reports may be able to prove the relative success or failure of the Prevention Plan and answer whether the centre is centralizing power on environmental policy. The graphs were compiled by using excel, and the graph shows the change in ranking between the different years. For example, between 2011 and 2012, Beijing changed its ranking from rank 7 in 2011 to rank 6 in 2012. Therefore, the change is (+1) because Beijing improved its ranking by a value of one. The cities are arranged into their individual city clusters. A detailed report on the specific cities can be found in the appendix.

<table>
<thead>
<tr>
<th>Year</th>
<th>City Cluster</th>
<th>Rank Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-2012</td>
<td>Beijing</td>
<td>(+1)</td>
</tr>
<tr>
<td>2011-2012</td>
<td>Mianyang in Chengdu-Chongqing city cluster</td>
<td>(+75)</td>
</tr>
<tr>
<td>2011-2012</td>
<td>Anshan in central Liaoning city cluster</td>
<td>(+3)</td>
</tr>
<tr>
<td>2011-2012</td>
<td>Yinbin in the same clusters</td>
<td>(+3)</td>
</tr>
</tbody>
</table>

Between 2011 and 2012, there were large fluctuations in the change in ranking, however even though there were regions that had less change than others, the different size of the regions makes it impossible to make an assessment between regions. However one can determine that the change is spread among all the city clusters instead of being centred into individual clusters. Therefore, most city clusters had cities that made larger change in their ranking as well as cities with smaller change. For instance, Mianyang in the Chengdu-Chongqing city cluster increased their ranking by a value of (+75) while Yinbin in the same clusters increased their ranking by a value of (+3). Anshan in the central Liaoning city cluster is also a city with
large change, it decreased its ranking by a value of (-51) while Benxi of the same cluster increased their ranking by a value of (+12).

Between 2012 and 2013 the change is centred in specific clusters, clearly showing which regions that made the greatest change. We can see that in the Jing-Jin-Ji Yangtze River Delta and Ganning city clusters, the change was marginal compared to most cities in the Chengdu-Chongqing, Pearl River Delta, Central Liaoning, Shandong Peninsula and Western Taiwan straits, which have many cities with a change value of 40 and above. However what we can distinguish between said city clusters is, almost all the cities between the Chengdu-Chongqing and Central Liaoning city clusters decreased their ranking, while almost all the cities in the Shandong Peninsula and Western Taiwan straits city clusters increased their ranking significantly. The cities with the largest change is, Chongqing in the Chengdu-Chongqing city cluster, which decreased its ranking by a value of (-86) and Weifang in the Shandong city cluster, which increased by a value of (+82).
Not many cities are consistently increasing or decreasing their ranking before and after the change in indicators, rather most cities made improvement the first year and decreased significantly the second year, or the other way around. Unfortunately, nothing conclusive has come of this data in terms of the relative success or failure of the Prevention Plan, as well as to answer the question if this would prove that the centre is centralizing power. Therefore, the thesis will make a descriptive analysis of the observations of the data.
6. Analysis

To sum up the findings so far; there is a conflict between economic development and environmental protection. (Qi et al., 2014) The thesis has discovered that there are a multitude of reasons for this; The local governments has a high level of autonomy when it comes to economic decision making, as well as environmental policy making. This makes the centre unable to directly control said local policies, decentralization has however been effective in boosting economic growth in China. (Zheng, 2006) Thus it is unlikely that the centre would want to change the current system that would risk annual growth rate. Therefore the centre developed a different way to ensure local governments compliance, by controlling the behaviour of local officials.

The centre controls local behaviour through the use of performance evaluation, however despite current efforts to make environmental performance relevant in the evaluation, the performance evaluation still favours economic performance rather than environmental performance. Therefore, since the centre has built a system in which the incentive for local officials is to receive promotion for their performance in office; (Easton et al., 2014) and since the performance is mainly based on economic growth, the local officials will thus act accordingly. Hence, it is not the local officials that refuse to care about environmental protection, instead they; “act within the institutional environment in which the formal rules are set by the central government (...) (Qi et al., 2014; 205)”.

The Prevention Plan is the first comprehensive environmental protection plan that is issued by the centre, (CAAC policy briefing, 2012) therefore it is safe to say that the policies of the plan reflects the will of the centre. The policies of the Plan show that the centre is not willing to change the institutional arrangements to prevent and control air pollution. The warrant for this is that the punishment for not meeting the air quality standards is aimed at the local government as an administrative unit. (IGES policy report, No. 2013-02) Hence, the loss of autonomy does not affect the performance evaluation of the local officials; and since the thesis have already established that it is the local officials that set the directives of the local government, the local governments are not incentivised to enforce environmental protection.
So, how well has the Prevention Plan been in preventing and controlling air pollution? The amount of data from the PITI reports will not only reflect the performance of the Prevention Plan but also reflect the level of compliance of local governments to the measures of the Prevention Plan. Both will illuminate whether the centre is centralizing power or not.

Source: author’s compilation

Figure 3.1 Thesis argumentation
6.1 Significance of the Prevention Plan

However, one question remain; how can the thesis analyse the result of the Prevention Plan by just including 65 out of 113 cities of the Key Regions? The APPC Law designates 120 key control cities for environmental protection. The thesis argues that because the law is an early attempt towards environmental protection, these cities are both politically and economically important, which the centre would prioritise to avoid instability in those cities, in light of the increasing environmental protests. For instance, according to the APPC Law, article 17; the Key Cities includes municipalities directly under the central government and provincial capitals. As well as costal open cities and key tourist cities are that attract a lot of international attention and are the main hubs for foreign direct investments.

*The State Council shall, in accordance with the general plan for urban development, the target of the environmental protection plan and the quality of the urban atmospheric environment, designate some cities as key cities for control of air pollution. Municipalities directly under the central government, provincial capitals, costal open cities and key tourist cities shall be designated as key cities for the control of air pollution (...) (APPC Law, article 17, 2000)*

In contrast, the thesis argues that the Prevention Plan emphasises environmental protection further than in the APPC Law, because the Plan is a manifestation of citizen discontent. The different purposes of the designated Key Cities and the Key Regions can be found in the fact that the sample of cities is not the same. Therefore, not only is the 65 cities politically sensitive areas, but also high level polluters, hence the thesis argues that these particular cities are cities which the centre would pressure the most to improve its air quality.

Besides the Key Control Regions in the Prevention Plan, the plan also classifies 47 cities as key control areas, where the regulations are even stricter and the requirements on pollution control even more stringent.

*The six cities in the Beijing-Tianjin-Hebei key control area include Beijing, Tianjin, Shijiazhuang, Tangshan, Baoding and Langfang. The fourteen city in the Yangtze River Delta key control area include Shanghai, Nanjing, Wuxi, Changzhou, Suzhou, Nantong, Yangzhou, Zhenjiang, Taizhou, Hangzhou, Ningbo, Jiaxing, Huzhou, Shaoxing and Pearl River Delta key control area consists of nine cities. Central Liaoning key control area includes Shenyang. Shandong Province key control area includes Jinan, Qingdao, Zibo, and Weifang. Wuhan key control area includes Wuhan and its surrounding areas. Changsha-Zhuzhou-Xiangtan region*
key control area is Changsha. Chengdu-Chongqing region key control area includes Chongqing and Chengdu. Straits Fujian key control area is Fuzhou and Sanming. Central and Northern Shanxi’s key control area is Taiyuan. Xi’an and Xianyang is the key control area of Shaanxi Guanzhong. Gansu-Ningxia region key control area is Lanzhou and Yinchuan. Xinjiang Province’s key control area is Urumqi. (CAAC policy briefing 2012; 15)

Naturally, considering the 65 cities that has been stipulated as the most politically sensitive and polluted cities in China, these 47 cities have even more pressure to improve their air quality. However, after analysing the results from the data, these cities do not provide a clear difference compared to the other 18 cities, in terms of change in ranking. Furthermore, the fact that 40 cities out of 47 are included in the thesis sample validates the importance of the sample as an analytical case.

Regional cooperation is the main feature of the Prevention Plan, the reason for the emphasis on regional cooperation is because of the close proximity of the cities in the city clusters; “as urban environment continues to expand and develop, atmospheric circulation causes the pollution interaction and transmission between cities to become more prominent (CAAC policy briefing 2012; 8)”. This means that a large portion of city pollution often comes from outside sources and the centre has realised that local governments cannot control air pollution on their own. Thus combining several cities into one administrative area and to develop environmental policies on both local and regional level is necessary to reduce air pollution. However because of the economic autonomy city governments enjoy, they seek to improve land development and attract foreign direct invest within their own jurisdiction, which cause great competition between city governments. (Shen, 2007)

The Prevention Plan makes several guiding ideas and objectives on what local governments should do in order to reduce and control air pollution, but the plan does not introduce any policies which would enable local governments to perform what the plan suggests. For instance the Prevention Plan states that; “(…) a regional air pollution joint prevention and control mechanism should be established to achieve unified planning, monitoring, management, evaluation and coordination (CAAC policy briefing 2012; 11)”. The plan does not explicitly provide the means or the incentives for local government to create these mechanisms, rather the policies inform what the local governments should do, not how it will be accomplished practically. This means that centre is dependent on the compliance of the local governments to implement the measures of the Prevention Plan.
The regional management mechanisms introduced in the plan are:

1. Establish unified joint regional prevention and control coordination mechanism.
2. Establish regional joint air quality enforcement supervision and management Mechanism.
3. Establish environmental impact assessment consultation mechanism for major projects.
4. Establish environmental information mechanisms.
5. Establish advance warning and emergency response mechanism for regional pollution.
6. Improve fiscal subsidies incentive policy.
7. Further expand price and financial trade policy.
8. Improve VOCs pollution charges policy.
9. Fully implement pollution discharge permit system.
10. Implement key industry environmental protection inspection.
11. Implement regulation on construction& operation of pollution facilities.
12. Implement Environmental information disclosure system.
13. Advanced city ambient air quality target management.
14. Establish a unified regional air quality monitoring system.

Source: CAAC policy briefing 2012; 35-40

6.2 Performance of the Prevention Plan

The Environmental Impact Assessment (EIA) is a system in which regular environmental information is necessary to provide accurate assessment of the environmental impact of projects. This system is heavily emphasized by the Prevention Plan to the point where it is illegal to construct coal factories in the key regions. Therefore, the EIA system is the most effective tool of local environmental protection institutions to prevent and control air pollution. Hence, the thesis argues that the amount of environmental data disclosed to EIA will determine how successful the local governments have been in meeting the air quality standards.
6.2.1 Environmental protection Bureau

The local environmental protection institution includes, the Environmental Protection Bureaus (EPB), which handles environmental affairs on a provincial, prefectural or county level of government. Funding comes from respective local governments which provide salaries, office space etc. to the EPBs. Their responsibilities include; overseeing the EIA; monitoring industrial pollution output; initiating legal actions against firms that do not comply with environmental regulations; ensuring public information disclosure; as well as education and awareness building. Furthermore, according to Hsu (2013), the local EPBs are required to fund an Environmental Monitoring Centre which is in charge of several general responsibilities, mainly providing data for the purposes of public reporting and communication. Because of EPBs many responsibilities in combination with the fact that their entire funding comes from local governments make the institution highly vulnerable to corruption. (Hsu, 2013; Qiu, 2008) Additionally, the data that EPBs are supposed to collect from industrial enterprises is being self-reported and only a quarter of the industrial enterprises are being monitored, thus fabrication of data is highly likely. Furthermore, the EPBs are only monitoring a small fraction of the industrial enterprises which makes it extremely difficult to make an accurate environmental assessment. (Hsu, 2013)
According to Hsu (2013) provincial and local EPBs are much less autonomous than relevant literature may indicate. For instance, in terms of monitoring, the EPBs are limited to what data they can collect and some data is only collected after major environmental pollution occur, especially ones that receive international headlines. Furthermore EPBs are often unsure on what data they are allowed to report because the centre is vague on what environmental data constitutes as a national security issue, thus there are limitations to the amount of data the EPBs collect and report. This indicates that the centre has much more control over local institutions than one might think, which means that local EPBs have to consider the interests of the centre and local government when collecting environmental data. (Hsu, 2013)

Local EPBs as an institution is therefore extremely restricted in their capabilities to monitor and report environmental data, as well as its capabilities to prevent illegal construction projects. However, the 2014 revision of the EP Law article 24, provide the legal authority of local EPBs to “(…) conduct the on-site inspection of enterprises, public institutions, and other business that discharge pollution”; also, article 25 provide the legal authority to “(…) seize or impound the facilities or equipment causing the discharge of pollutants”. Other articles in the newly revised EP Law includes article 44, which stipulates that EPBs at provincial level can “(…) suspend the procedures for approving the environmental impact assessment documents on construction projects (…)”. This means that from 2014, if pollution exceeds the new ambient environmental standards, provincial EPBs have the legal basis to cancel construction projects.

Furthermore, the EP Law gives EPBs the legal authority, and local governments the responsibility, to supervise environmental protection. According to article, 67 of the EP Law, Provincial governments and provincial EPBs “(…) shall strengthen supervision over the environmental protection work of the people´s governments at lower levels and the relevant departments thereof (…)”; if local EPBs “(…) fails to impose administrative punishment as otherwise legally required (…) EPBs (…) at a higher level may directly make a decision to impose administrative punishment.” However, without political basis, these laws do not have any substance, as already discussed in the literature review. The Prevention Plan do not provide any explicit authority to the EPBs, rather, it enhances the EIA system as a tool for local environmental enforcement.
6.2.2 Environmental Impact Assessment

The EIA system was first implemented in the 1970s and has sense then been revised multiple times, in contemporary China; “(…) Environmental Impact Assessment System - has gradually evolved and developed into a legal system, in the form of articles in relevant laws (e.g., article 11 in the APPC Law) as well as a stand along piece of legislation (the EIA law) since 2012 (IGES policy report, No. 2013-02; 15)” The system has become one of Chinas main regulatory instruments for environmental protection and the intent of the EIA system is to assess the environmental impact of construction projects. MEP has the responsibility in overseeing and coordinating EIA implementation on a national level, while Environmental Protection Bureaus (EPBs) oversees EIA on a local level. Therefore if project is deemed to cause more pollution than environmental standards and regulations allow, MEP and local EPBs have the authority to deny the construction of the project. (Wang et al., 2003)

An Environmental Impact Report (EIR) is needed to be submitted for construction projects to be allowed, however there are three categories that determine the necessity of an EIR:

- **Category A**: Projects which are likely to cause a range of significant adverse environmental impact need to produce an EIR.
- **Category B**: Projects which are likely cause to a limited number of significant adverse environmental impacts need to produce an Environmental Impact Form (EIF).
- **Category C**: Projects not expected significant adverse environmental impacts do not require a EIA but should fill in an Environmental Impact Registration Form (EIRF)

Source: Wang et al., 2003; 552

The agency that produces the EIR need to be approved by MEP under the EIA Licence System, furthermore only MEP, provincial, autonomous region or municipal (Prefectural) Environmental Protection Bureaus (EPBs), and county EPBs has the jurisdiction of approving an EIR.
According to Wang et al. (2003) and article 10, 13, 14, 17 of the Law of the People’s Republic of China on Appraising of Environmental Impacts (EIA Law) the process for an EIR is:

1. After the developer has submitted the project proposal, MEP and local EPBs decides whether an EIR is necessary or not. There are two main criteria on how to assess the environmental impact of proposed projects;

   
   (...) (1) ‘pollutant discharge’, relating to emission volume, types and complexity of pollutants, and the possibilities of abatement; and (2) ‘sensitive area’, based on the importance of ecological, archaeological and cultural value and numbers and sensitivity of humans affected (Wang et. al., 2003; 555).

2. If an EIR is required the developer need to request a licensed agency to make an EIA action outline, when the outline has been approved by the local EPB the developer need to contract a licensed agency to conduct the impact assessment.

3. The impact assessment team then needs to request environmental information from the local environmental monitor stations, which every local EPB is required to fund.

4. To determine the significance of the environmental impact, EIA is comparing the legislative and regulatory requirements, established environmental standards or pollution abatement requirements with the predicted environmental impact of the proposed project. Mitigation measures should also be considered into the EIR.

5. When the EIR is complete, it is reviewed by the local EPB in consultation with other relevant authorities involved in the project.

6. Lastly a decision is made by MEP and local EPBs whether or not the project will proceed.

After the construction has begun, the EPB and the developer are required to monitor the construction process to make sure that the production process and products are in accordance with the EIR and complying with environmental standards set out in the EIR. (Wang et. al., 2003)

Though the EIA system is fairly straightforward, the framework of the EIA is very complex. For instance, the EIA law has institutionalized strategic environmental assessment which incorporates plans and programs into the EIA framework instead of just focusing on projects. Furthermore, According to Wang et. al. (2003); “the Environmental Protection Law (EP Law)
sets out basic requirements for impacts assessment, but this is then elaborated in more than a dozen specific sector laws and numerous regulations and ordinances (Wang et. al., 2003; 559). However, because the Prevention Plan only focuses on construction projects the EIA framework becomes much easier to define.

The Prevention Plan introduces stricter enforcement of EIA regulations and overall strengthens the implementation of EIA in the regions included in the plan while regions excluded in the plan are less strict. Besides the restrictions on projects discussed above, the Prevention Plan makes sure that EIA completely prohibit or highly restrict investment in high pollution industries, such as coal fired power plants, iron and steel building materials, coking, non-ferrous metals, petrochemicals and chemicals. Furthermore, according to the IGES policy report (2013);

The Prevention Plan states that; (...) industrial construction projects which fail to receive EIA approval should not receive approvals for construction (or even have their applications reviewed or considered), production licenses, safety production licenses, or emission permits (IGES policy report, No. 2013-02; 53).

Therefore, according to the EP Law, article 19; as EIA is legally required in the preparation of construction projects, the EIA system becomes a powerful tool for environmental protection. Furthermore, the EP Law also states that if said projects or plan have not undergone an EIA, they may not be commenced or implemented.

What is noticeable is that the EIA law enhances the central government’s ability to control air pollution output in the provinces, as well as enhances the authority of MEP and local EPBs. In other words the EIA law increases the centres influence over local environmental protection institutions without directly going through local government channels and communication. Therefore EIA is the most effective tool of local EPBs to prevent and control air pollution.

However, the EIA should not be overestimated because the underlying problem of local environmental enforcement of environmental regulation lies in the fact that the institutional environment still favours economic growth over environmental protection. Thus, since it is the local government’s responsibility to disclose environmental information to EIA, the EIA system has some sever restrictions.
6.2.3 Air Quality standards

The thesis has made arguments that the local governments in the key regions will not be able to meet the air quality standards if they do not disclose environmental information to EIA. Therefore a short analysis of the main futures of the new environmental standards will be analysed in this section.

“Environmental standards refer to a set of technical requirements established to meet the environmental legislative goals of protecting environmental quality and controlling pollution (Qiu, 2008; 14)”. Since 2011, the new standards have been developed gradually, the standard include; (1) ambient air quality standard; (2) industrial emission standards; and (3) vehicle emission standards. (IGES policy report, No. 2013-02)

The standards are too technical to make an empirical assessment of whether the new standards are strict relative to the capabilities of the local governments. However MEP has made considerations into the characteristics of air pollution and the capabilities of the local governments when realising the new (1) ambient air quality standards, thus this particular standard are not the same from region to region. The goal is that every city in China will follow the same standards eventually, therefore MEP requires local governments to prepare for the implementation of the standards, such as, installation of new equipment, procedures to manage data quality, and training for operational staff. 74 cities in the key regions have already started monitoring since of 2012 and supposedly the rest of the 59 key cities will have implemented the monitoring network and public reporting system by 2013. (IGES policy report, No. 2013-02)

Another considerably revised standard is the (2) industrial emission standards, which stipulates that even new sources of pollution should meet the environmental standards regardless of the impact. This means that if a coal factory is constructed in an area where pollution from coal factories previously didn’t exist will have to follow the standards regardless of how little impact it have had so far, because it is a new emission source. Furthermore specifically six industries (thermal power, Iron, steel, petrochemicals, cement, non-ferrous metals and chemicals) need to follow the international emission limits on air born pollution in 47 cities. (IGES policy report, No. 2013-02)

(3) The vehicle emission standards are based on the European standards, which mean that previously allowed cars for retail is not allowed to be produced anymore and heavy duty gasoline cars already sold, both domestically produced or imported, must follow the new
standards as well. There are different levels of strictness in the vehicle emission standards, from phase one to phase five, five being the strictest, thus the fifth phase is only encouraged if feasible. An annual environmental protection attainment examination system for cars will also be implemented in the 113 key cities, and the cars that do not follow the attainment standards will be marked as outdate, thus these kinds of cars will eventually be phased out. (IGES policy report, No. 2013-02)

All three of the new air quality standards are significant improvement in preventing and controlling air pollution considering the measures described above, but it is only the ambient air quality standards that have consequences of compliance for local governments. What is noticeable however is that MEP has made its way to consider the regional difference when releasing the new ambient air quality standards, thus it is not realistic to believe that the centre is directly trying to centralise their influence in the local government through these new environmental standards. Even though the goal is eventually for all cities in China to have the same standards, the standards are particularly more stringent in the key regions.

The next section will analyse the results from the data to determine whether the local governments have been successful in meeting the air quality standards.

### 6.3 Data Analysis

Since nothing conclusive has come from simply analysing the change in ranking, concerning whether the centre is centralizing power or if the Prevention Plan has been successful or not. The thesis will make a descriptive analysis of the data, followed by a discussion.

#### 6.3.1 2011-2012 PITI Report

In 2011 the 12th FYP was implemented, and the Prevention Plan was implemented in 2012, considering that no change in indicators occurred during 2011 and 2012 the fluctuation ranks is un-proportionally large.

According to the data, the fact that large fluctuation occurred without any specific pattern, meaning that the change was spread among all regions instead of it being consistent within a few regions, shows the importance in local cadre behaviour. The 12th FYP was implemented in 2011, however this does not justify the large change in ranking because it is unlikely that the 12th FYP could have such large effect on the ranking within just a year. Hence, unless the researcher has missed any big events before 2011 that would affect environmental information disclosure, the only other explanation would be that it is the high cadre turnover
that affects the change. As the thesis has already explained, it is the local officials that set the
general directives of the local government. Therefore, a change of local leadership could
justify the change in ranking because the new local cadre has different priorities than its
predecessor. Furthermore, since the turnover is less than five year, the change in ranking can
happen quite frequently.

Since there were many cities that either increased or decreased their ranking greatly during
this period, the thesis will describe them in this section.

**Jing-Jin-Ji**  
Baoding is the only city in the Jing-Jin-Ji city cluster which has a
ranking change above 11, the city decreased its ranking by a value of
(-43)

**Yangtze River Delta**  
In the Yangtze River delta the change was marginal with a value not
above 11, some exceptions include, Jiaxing (+22), Yangzhou (+33),
Lianyungang (+30), Xuzhou (+16), Taizhou (-16), and Changzhou
(-17).

**Ganning**  
A rather small city cluster with a total of three cities, with only
Yinchuan and Lanzhou ranked in the PITI report. Both decreased their
ranking by a value of (-29) and (-30) respectively.

**Chengdu-Chongqing**  
The city of Mianyang In the Chengdu-Chongqing city cluster has
without a doubt the largest change of all the 65 cities in 2011-2012
report, with an improvement value of (+75) and a comparatively lesser
improvement by Chengdu of a value of (+17), the rest had a marginal
change not above the value of 5.

**Pearl River Delta**  
The largest change in the Pearl River Delta region includes, Zuhai
(-34), Foshan (-23) and Zhongshan (-15). The rest have no larger
change value than 9.

**Central Liaoning**  
The cities in the central Liaoning cluster have a change value not above
12, except Anshan (-51) and Fushun (+34)
Shandong Peninsula  The cities in the Shandong city cluster has marginal change value no more than 23, however two cities stands out, Rizhao and Weifang, with (+ 30) and (- 47) respectively.

Others  The rest of the 13 cities and six city clusters have relatively small change, a value of not above 12, except for four cities. Xiamen (- 19), Tongchuan (- 40), Baoji (+ 44) and Xianyang (- 25)

6.3.2 2012-2013 PITI Report
Between 2012 and 2013, the change in indicators occurred, which saw the result of every city in the PITI sample reduced their scores significantly which will have an effect on the overall rankings. This means that the change in indicators favoured the Shandong peninsula and Western Taiwan straits city clusters greatly because the rank increase illustrates that the change in indicators of the PITI report favoured the information disclosure system they already had in place. While disfavouring the Chengdu-Chongqing, Pearl River Delta, Central Liaoning city clusters. Also, though a few cities in the other regions have high change value as well and some with low, the relative change compared to the other city clusters mentioned above makes the change marginal. Thus the Jing-Jin-Ji, Yangtze River Delta, Ganning, Changsha-Zhuzhou-Xiangtan, Wuhan Metropolitan region, central and northern Shanxi, central Shaanxi and the Urumqi city cluster already had relatively comprehensive environmental information disclosure measures in place.

The changes in the rankings will be described in this section.

Jing-Jin-Ji  There is small change in the Jing-Jin-Ji city cluster with a value not above 6, except Baoding (+13) and Tangshan (+ 24)

Yangtze River Delta  The change in the Yangtze River Delta is also relatively small with a few exception, Shaoxing (+ 21), Yangcheng (+ 17), Lianyungang (+ 32), and Xuzhou (+ 17).

Ganning  Ganning has very small change, not above the value of 11
Chengdu-Chongqing  Chongqing in the Chengdu-Chongqing city cluster has the largest change between 2012 and 2014 with a decrease value of (-86), the rest of the cities has a marginal change, no larger than the value of 17. Except Mianyang which have decreased its value by (-29).

Central Liaoning  The cities in the Central Liaoning and Pearl River Delta have almost consistently decreased their ranking, except for Zuhai (+11). The cities with the largest change include, Guangzhou (-29), Shenzhen (-27), Dongguan (-49), Foshan (-33), Benxi (-53) and Fushun (-32).

Shandong Peninsula  Shandong city cluster has the cities with the largest improvement and also the only city cluster where every city improved their ranking. The largest, and most notable, change is in, Jining (+51), Tai’an (+70), Weifang (+82), and Zaozhuang (+80).

Others  The rest of the 13 cities in the six remaining city clusters have relatively small change with a value of not above 15, with a few exception, Xiamen (+68), Taiyuan (-35), and Xianyang (+30).

6.4 Discussion  
The literature and data has shown us several reasons to how we can consider the Prevention Plan a failure to prevent and control air pollution, as well as the possibility of the centre centralizing power.

The 2011-2012 data has shown that the turnover of local cadres has some impact on the environmental information disclosure. As the thesis has already explained, it is the local cadres of the local governments that control direction in which the local government will take, though some local governments have more pressure to follow the centres directives than others. These 65 cities has arguably the most pressure to follow the centre directives, thus they should be improving their rankings significantly, however this is not the case. This shows that there are not enough incentives or constraints for local officials to improve the environmental information disclosure. Therefore changing the institutional arrangements concerning environmental protection should be prioritised.
The thesis argues that the environmental information disclosure data reflects the directives of the centre because the centre has an institutional advantage and can thus change the behaviour of local governments. No policy in the Prevention Plan indicates however that the centre is planning to change the current institutional arrangements, in fact, the 2012-2013 data show that environmental information disclosure is very low and runs counter to the Prevention Plan. The amount of cities that scored points in the disclosure of emission data from key enterprises is only 12.7% and Environmental Impact Assessment (EIA) information, is 5%.

Therefore, since the EIA is dependent on environmental information and the EPBs are in turn dependent on the EIA as an enforcement tool, the Prevention Plan has failed to prevent and control air pollution locally. At the same time, these measures show that the centre is indeed centralizing power of environmental protection for two reasons, firstly, the low environmental information disclosure rate shows that the centre do not want to change the current institutional arrangements. Secondly, the emphasis on EIA in the Prevention Plan shows that the centre wants to remove local government’s interference in the local EPB procedures.

Furthermore, because the consequence of not meeting the air quality standards, results in less autonomy on environmental policy-making, the thesis argues that these are further measures to centralize power on environmental protection, by indirectly making it difficult for local governments to meet the standards; in combination with lack of incentives and constraints on local officials.
7. Conclusion

The main research question of the thesis was to answer; how have environmental policy affected central-local relations in China? Thus, the purpose of the thesis has been to showcase the connection between environmental issues and central-local relations in contemporary China. However it developed into something more, where the Prevention Plan has some distinct features that clearly show the intentions of the centre, such as local government loss of autonomy on environmental policy. Thus adding an additional research question; why does the Prevention Plan ignore compliance by local officials in implementing environmental policy on the local government level?

By using the central-local relations theory and de facto federalism, the thesis has been able to identify theoretically the reasons behind the measures of the Prevention Plan, mainly the intention of moving environmental policy from the bargaining zone to the centrally dictated zone. Hence, the thesis has shown that the centre wants to improve local implementation of environmental policy without changing the institutional arrangements that has boosted economic growth in China in the past. Therefore, the centre has chosen to centralize environmental policy entirely and remove the implementation problem altogether, thus changing the formal structure of the Chinese system while leaving the behavioural level intact.

However, further study from the perspective of Heilmann (2008) is needed. It is possible that centralization and decentralization is occurring frequently, instead of the most common notion that there has been decentralization since the 1980s. Thus, the measures of the Prevention Plan do not have to mean anything other than that there is a multilevel interaction between different levels of government and stakeholders.
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17 Qi, Ye; Zhang, Lingyun (2014) “Local Environmental Enforcement Constrained by Central-Local Relations in China” Environmental Policy and Governance, 24: 204-215


Internet sources


Primary data


32. (Prevention Plan) Key Control Region 12th- Five-Year Air Pollution Plan http://www.epa.gov/ogc/china/air%20pollution.pdf

Books


9. Appendix

2011-2012 PITI Data

Top down approach

Provinces (Beijing, Tianjin, Hebei)

<table>
<thead>
<tr>
<th>Jing-Jin-Ji</th>
<th>Rank</th>
<th>2011</th>
<th>Rank</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
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<td>6</td>
<td>+</td>
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</tr>
<tr>
<td>Tianjin (P)</td>
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<td>23</td>
<td>+</td>
<td>11</td>
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<td>-</td>
<td>43</td>
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<td>-</td>
<td>10</td>
</tr>
<tr>
<td>Handan</td>
<td>65</td>
<td>54</td>
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<td>11</td>
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<tr>
<td>Qinhuangdao</td>
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<td>88</td>
<td>/</td>
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<tr>
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<td>62</td>
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The following cities are not included in the PIT index (Chengde, Hengshui, Langfang, Xingtai, Zhangjiakou)

Provinces (Shanghai, Jiangsu, Zhejiang)

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<tr>
<th>Yangtze River Delta</th>
<th>Rank</th>
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<th>Rank</th>
<th>2012</th>
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<tbody>
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<td>Ningbo</td>
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<td>/</td>
<td>0</td>
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<td>-</td>
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Provinces (Gansu and Ningxia)

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Provinces (Sichuan, Chongqing)

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<td>5. Yibin</td>
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<td>103</td>
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</tbody>
</table>

The following cities are not included in the PIT index (Zigong, Deyang, Suining, Neijiang, Leshan, Nanchong, Meishan, Guang’an, Dazhou, Ziyang)

**Bottom up approach**

Provinces (Guangdong)

<table>
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<tr>
<th>Pearl River Delta</th>
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Provinces (Liaoning)

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Provinces (Shandong)

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Provinces (Fujian)

**Western Taiwan Straits**

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Provinces (Hunan)

**Changsha - Zhuzhou – Xiangtan**

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Provinces (Hubei)

**Wuhan metropolitan region**

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<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Wuhan</td>
<td>23</td>
</tr>
</tbody>
</table>

The following cities are not included in the PIT index (Ezhou, Huanggang, Huangshi, Xianning, Xiaogan)

Provinces (Shanxi)

**Central and Northern Shanxi**

<table>
<thead>
<tr>
<th>Rank</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Taiyuan</td>
<td>37</td>
</tr>
<tr>
<td>2.</td>
<td>Datong</td>
<td>101</td>
</tr>
</tbody>
</table>

The following cities are not included in the PIT index (Shuzhou, Xinzhou)

Provinces (Shaanxi)

**Central Shaanxi**

<table>
<thead>
<tr>
<th>Rank</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Xi’an</td>
<td>73</td>
</tr>
<tr>
<td>2.</td>
<td>Tongchuan</td>
<td>60</td>
</tr>
<tr>
<td>3.</td>
<td>Baoji</td>
<td>100</td>
</tr>
<tr>
<td>4.</td>
<td>Xianyang</td>
<td>86</td>
</tr>
</tbody>
</table>

The following cities are not included in the PIT index (Weinan)

Provinces (Xianjing)

**Urumqi city cluster**

<table>
<thead>
<tr>
<th>Rank</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Urumqi</td>
<td>62</td>
</tr>
</tbody>
</table>

The following cities are not included in the PIT index (Changji, Wujiaxu)

If there is a large change between 2011 and 2012, where no change in the indicators has occurred, then the data is of bad quality. Or perhaps the introduction of the Prevention Plan had such a huge effect?
**2012-2013 PITI Data**

**Top down approach**

Provinces (Beijing, Tianjin, Hebei)

<table>
<thead>
<tr>
<th>Jing-Jin-Ji</th>
<th>Rank 2012</th>
<th>Rank 2013</th>
<th>+/−</th>
<th>Rank 2013-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Beijing (P)</td>
<td>6</td>
<td>2</td>
<td>+</td>
<td>4</td>
</tr>
<tr>
<td>9. Tianjin (P)</td>
<td>23</td>
<td>21</td>
<td>+</td>
<td>2</td>
</tr>
<tr>
<td>10. Baoding</td>
<td>79</td>
<td>66</td>
<td>+</td>
<td>13</td>
</tr>
<tr>
<td>11. Shijiazhuang</td>
<td>37</td>
<td>42</td>
<td>−</td>
<td>5</td>
</tr>
<tr>
<td>12. Handan</td>
<td>54</td>
<td>48</td>
<td>+</td>
<td>6</td>
</tr>
<tr>
<td>13. Qinhuangdao</td>
<td>88</td>
<td>93</td>
<td>−</td>
<td>5</td>
</tr>
<tr>
<td>14. Tangshan</td>
<td>62</td>
<td>38</td>
<td>+</td>
<td>24</td>
</tr>
</tbody>
</table>

*The following cities are not included in the PIT index (Chengde, Hengshui, Langfang, Xingtai, Zhangjiakou)*

Provinces (Shanghai, Jiangsu, Zhejiang)

<table>
<thead>
<tr>
<th>Yangtze River Delta</th>
<th>Rank 2012</th>
<th>Rank 2013</th>
<th>+/−</th>
<th>Rank 2013-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. Shanghai (P)</td>
<td>14</td>
<td>7</td>
<td>+</td>
<td>7</td>
</tr>
<tr>
<td>19. Nanjing</td>
<td>15</td>
<td>8</td>
<td>+</td>
<td>7</td>
</tr>
<tr>
<td>20. Hangzhou</td>
<td>8</td>
<td>6</td>
<td>+</td>
<td>2</td>
</tr>
<tr>
<td>21. Suzhou</td>
<td>18</td>
<td>14</td>
<td>+</td>
<td>4</td>
</tr>
<tr>
<td>22. Ningbo</td>
<td>1</td>
<td>1</td>
<td>/</td>
<td>0</td>
</tr>
<tr>
<td>23. Wuxi</td>
<td>22</td>
<td>15</td>
<td>+</td>
<td>7</td>
</tr>
<tr>
<td>24. Nantong</td>
<td>17</td>
<td>29</td>
<td>−</td>
<td>12</td>
</tr>
<tr>
<td>25. Shaoxing</td>
<td>43</td>
<td>22</td>
<td>+</td>
<td>21</td>
</tr>
<tr>
<td>26. Jiaxing</td>
<td>13</td>
<td>23</td>
<td>−</td>
<td>10</td>
</tr>
<tr>
<td>27. Taizhou</td>
<td>21</td>
<td>11</td>
<td>+</td>
<td>10</td>
</tr>
<tr>
<td>28. Yangzhou</td>
<td>5</td>
<td>10</td>
<td>−</td>
<td>5</td>
</tr>
<tr>
<td>29. Yancheng</td>
<td>51</td>
<td>34</td>
<td>+</td>
<td>17</td>
</tr>
<tr>
<td>30. Huzhou</td>
<td>39</td>
<td>40</td>
<td>−</td>
<td>1</td>
</tr>
<tr>
<td>31. Lianyungang</td>
<td>49</td>
<td>17</td>
<td>+</td>
<td>32</td>
</tr>
<tr>
<td>32. Xuzhou</td>
<td>47</td>
<td>30</td>
<td>+</td>
<td>17</td>
</tr>
<tr>
<td>33. Wenzhou</td>
<td>10</td>
<td>5</td>
<td>+</td>
<td>5</td>
</tr>
<tr>
<td>34. Changzhou</td>
<td>20</td>
<td>9</td>
<td>+</td>
<td>11</td>
</tr>
</tbody>
</table>

*The following cities are not included in the PIT index (Jinhua, Huai’nan, Zhoushan, Quzhou, Suqian and Lishui)*

Provinces (Gansu and Ningxia)

<table>
<thead>
<tr>
<th>Ganning</th>
<th>Rank 2012</th>
<th>Rank 2013</th>
<th>+/−</th>
<th>Rank 2013-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Lanzhou</td>
<td>97</td>
<td>108</td>
<td>−</td>
<td>11</td>
</tr>
<tr>
<td>4. Yinchuan</td>
<td>58</td>
<td>57</td>
<td>+</td>
<td>1</td>
</tr>
</tbody>
</table>

*The following cities are not included in the PIT index (Baiyin)*

Provinces (Sichuan, Chongqing)
### Chengdu-Chongqing

<table>
<thead>
<tr>
<th>Rank</th>
<th>2012</th>
<th>Rank</th>
<th>2013-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Chongqing</td>
<td>9</td>
<td>95</td>
</tr>
<tr>
<td>7.</td>
<td>Chengdu</td>
<td>42</td>
<td>25</td>
</tr>
<tr>
<td>8.</td>
<td>Luzhou</td>
<td>74</td>
<td>63</td>
</tr>
<tr>
<td>9.</td>
<td>Mianyang</td>
<td>36</td>
<td>65</td>
</tr>
<tr>
<td>10.</td>
<td>Yibin</td>
<td>103</td>
<td>90</td>
</tr>
</tbody>
</table>

The following cities are not included in the PIT index (Zigong, Deyang, Suining, Neijiang, Leshan, Nanchong, Meishan, Guang’an, Dazhou, Ziyang)

### Bottom up approach

**Provinces (Guangdong)**

#### Pearl River Delta

<table>
<thead>
<tr>
<th>Rank</th>
<th>2012</th>
<th>Rank</th>
<th>2013-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>Guangzhou</td>
<td>7</td>
<td>36</td>
</tr>
<tr>
<td>8.</td>
<td>Shenzhen</td>
<td>4</td>
<td>31</td>
</tr>
<tr>
<td>9.</td>
<td>Zhuhai</td>
<td>84</td>
<td>73</td>
</tr>
<tr>
<td>10.</td>
<td>Dongguan</td>
<td>2</td>
<td>51</td>
</tr>
<tr>
<td>11.</td>
<td>Foshan</td>
<td>29</td>
<td>62</td>
</tr>
<tr>
<td>12.</td>
<td>Zhongshan</td>
<td>19</td>
<td>37</td>
</tr>
</tbody>
</table>

The following cities are not included in the PIT index (Jiangmen, Huizhou, Zhaqoing)

**Provinces (Liaoning)**

#### Central Liaoning

<table>
<thead>
<tr>
<th>Rank</th>
<th>2012</th>
<th>Rank</th>
<th>2013-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>Shenyang</td>
<td>32</td>
<td>45</td>
</tr>
<tr>
<td>6.</td>
<td>Anshan</td>
<td>99</td>
<td>102</td>
</tr>
<tr>
<td>7.</td>
<td>Benxi</td>
<td>45</td>
<td>98</td>
</tr>
<tr>
<td>8.</td>
<td>Fushun</td>
<td>53</td>
<td>85</td>
</tr>
</tbody>
</table>

The following cities are not included in the PIT index (Yingkou, Liaoang, Tieling)

**Provinces (Shandong)**

#### Shandong peninsula

<table>
<thead>
<tr>
<th>Rank</th>
<th>2012</th>
<th>Rank</th>
<th>2013-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>Jinan</td>
<td>61</td>
<td>24</td>
</tr>
<tr>
<td>12.</td>
<td>Qingdao</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>13.</td>
<td>Jining</td>
<td>101</td>
<td>50</td>
</tr>
<tr>
<td>14.</td>
<td>Rizhao</td>
<td>59</td>
<td>41</td>
</tr>
<tr>
<td>15.</td>
<td>Tai’an</td>
<td>98</td>
<td>28</td>
</tr>
<tr>
<td>16.</td>
<td>Weifang</td>
<td>102</td>
<td>20</td>
</tr>
<tr>
<td>17.</td>
<td>Weihai</td>
<td>50</td>
<td>44</td>
</tr>
<tr>
<td>18.</td>
<td>Yantai</td>
<td>35</td>
<td>13</td>
</tr>
<tr>
<td>19.</td>
<td>Zaozhuang</td>
<td>113</td>
<td>33</td>
</tr>
<tr>
<td>20.</td>
<td>Zibo</td>
<td>55</td>
<td>35</td>
</tr>
</tbody>
</table>

The following cities are not included in the PIT index (Binzhou, Dezhou, Dongying, Heze, Liaocheng, Linyi, Dongyng, Laiwu)

**Provinces (Fujian)**
<table>
<thead>
<tr>
<th>Western Taiwan Straits</th>
<th>Rank</th>
<th>2012</th>
<th>Rank</th>
<th>2013-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Xiamen</td>
<td>94</td>
<td>26</td>
<td>+</td>
<td>68</td>
</tr>
<tr>
<td>5. Quanzhou</td>
<td>16</td>
<td>27</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>6. Fuzhou</td>
<td>12</td>
<td>16</td>
<td>-</td>
<td>4</td>
</tr>
</tbody>
</table>

The following cities are not included in the PIT index (Zhangzhou, Putian, Sanming, Nanping, Longyan, Ningde)

<table>
<thead>
<tr>
<th>Provinces (Hunan)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Changsha - Zhuzhou – Xiangtan</strong></td>
<td>Rank</td>
<td>2012</td>
<td>Rank</td>
</tr>
<tr>
<td>4. Changsha</td>
<td>77</td>
<td>67</td>
<td>+</td>
</tr>
<tr>
<td>5. Zhuzhou</td>
<td>78</td>
<td>80</td>
<td>-</td>
</tr>
<tr>
<td>6. Xiangtan</td>
<td>52</td>
<td>52</td>
<td>/</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Provinces (Hubei)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wuhan metropolitan region</strong></td>
<td>Rank</td>
<td>2012</td>
<td>Rank</td>
</tr>
<tr>
<td>2. Wuhan</td>
<td>31</td>
<td>32</td>
<td>-</td>
</tr>
</tbody>
</table>

The following cities are not included in the PIT index (Ezhou, Huanggang, Huangshi, Xianning, Xiaogan)

<table>
<thead>
<tr>
<th>Provinces (Shanxi)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Central and Northern Shanxi</strong></td>
<td>Rank</td>
<td>2012</td>
<td>Rank</td>
</tr>
<tr>
<td>3. Taiyuan</td>
<td>41</td>
<td>76</td>
<td>-</td>
</tr>
<tr>
<td>4. Datong</td>
<td>112</td>
<td>120</td>
<td>-</td>
</tr>
</tbody>
</table>

The following cities are not included in the PIT index (Shuzhou, Xinzhou)

<table>
<thead>
<tr>
<th>Provinces (Shaanxi)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Central Shaanxi</strong></td>
<td>Rank</td>
<td>2012</td>
<td>Rank</td>
</tr>
<tr>
<td>5. Xi’an</td>
<td>68</td>
<td>53</td>
<td>+</td>
</tr>
<tr>
<td>6. Tongchuan</td>
<td>100</td>
<td>97</td>
<td>-</td>
</tr>
<tr>
<td>7. Baoji</td>
<td>56</td>
<td>54</td>
<td>+</td>
</tr>
<tr>
<td>8. Xianyang</td>
<td>111</td>
<td>81</td>
<td>+</td>
</tr>
</tbody>
</table>

The following cities are not included in the PIT index (Weinan)

<table>
<thead>
<tr>
<th>Provinces (Xianjing)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Urumqi city cluster</strong></td>
<td>Rank</td>
<td>2012</td>
<td>Rank</td>
</tr>
<tr>
<td>2. Urumqi</td>
<td>74</td>
<td>77</td>
<td>-</td>
</tr>
</tbody>
</table>

The following cities are not included in the PIT index (Changji, Wujiaxu)