

# The drivers of local environmental policy in China: An analysis of Shenzhen's environmental performance management system, 2007–2015



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## ARTICLE INFO

### Article history:

Received 4 January 2017

Received in revised form

19 July 2017

Accepted 20 July 2017

Available online 25 July 2017

### Keywords:

Environmental performance management

Local government

Policy evolution

Shenzhen

## ABSTRACT

To combat significant pollution problems, a number of local governments in China have utilized performance management to improve cadres' accountability on environmental issues. Despite the extensive literature on public sector performance management, attention to environmental performance management has been relatively scant. Taking Shenzhen – one of China's most densely populated, affluent, and rapidly growing cities – as a case study, this article describes and analyzes the evolution of the local environmental performance management system from 2007 to 2015. A series of external and internal factors are identified as determinants of policy evolution, including cadres' individual decision-making, higher-level policies, intra-governmental interactions (horizontally and vertically), the relative salience of environmental issues, and strategies in policy experimentation. The multiplicity of factors further complicates the already complex process of performance measurement by setting it in a complex political context, which can distort the efficacy and objectives of the system, resulting in an unpredictable and compromised policy tool. Improving government environmental performance management involves reducing complexity by reforming aspects of the political context, allowing for a more serious, open, and transparent decision-making process.

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## 1. Introduction

Due to rapid industrialization and urbanization over the past three decades, China has been affected by daunting environmental pollution. A recent study estimates that about 1.3 million premature deaths per year in China are caused by air pollution (Liu et al., 2016a). In addition, in 2012, 40% of the country's rivers were seriously polluted (Jian, 2012). Currently, more than 80% of the water from underground wells used by farms, factories and households across the heavily populated plains of China is unfit for drinking or bathing because of contamination (Buckley and Piao, 2016). Furthermore, about 19.4% of the country's arable land is polluted (Ministry of Environmental Protection and Ministry of Land Resources, 2014). According to the Environmental

Performance Index 2016 Report by Yale University, China ranked 109 out of 180 countries (Hsu et al., 2016).

In fact, and largely in response to these increasingly urgent problems, China's environmental management system has experienced a great leap forward in recent years (Liu et al., 2016b). However, aligning local governments, whose primary political prerogative remains economic growth, with national goals of environmental protection has been a major policy challenge (Qi et al., 2008; Qi and Wu, 2013). To address this issue, the central government has instituted performance-oriented measures for administrators since 1988, when the Environmental Committee of the State Council (since disbanded) decided to carry out annual environmental quality assessments for 113 major cities and link mayors' political prospects with the assessments' results. A recent, notable example is the "Evaluation Method of the Implementation of Atmospheric Pollution Prevention and Control Action Plan (Trial)," promulgated by the State Council in 2014. Air pollution reduction targets were set for provincial-level governments, which

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then disaggregated the target down to lower-level governments. The annual, final evaluation results were then declared an important basis for the comprehensive track record evaluation of cadres.

Against this political and institutional backdrop, since the 2000s, a number of local governments have set up Environmental Protection Performance Evaluation (EPPE) systems for their cadres (Liu et al., 2016b). The aim of EPPE is to galvanize local cadres to be more proactive on environmental issues by measuring their progress on local environmental protection issues and then using the results as a factor in promotion or demotion. Among these local EPPE systems, Shenzhen's remains relatively unique in that it has been in operation for nearly a decade. It has mature institutional arrangements and has been covered by various national media outlets and praised by the government's powerful Central Organization Department, which is responsible for major personnel decisions. Shenzhen is China's first Special Economic Zone (SEZ) and is situated to the immediate north of Hong Kong, as shown in Fig. 1. The establishment of the Shenzhen SEZ was an important milestone in China's economic reforms, and the rapid development of the city from a rural fishing community into a modern metropolis has helped validate the success of those reforms. Today it boasts over 15 million residents living on 1991 square kilometers of land, and is the fifth most populous city in the world (Wang, 2012). In 2014, Shenzhen's GDP reached ¥1600 billion and ranked 4th among China's cities (Shenzhen Statistics Bureau, 2015).

Despite its robust economy, Shenzhen has been combatting pollution problems that have arisen as a result of its urbanization (Liu and Ma, 2010, 2011). According to China Sustainable Cities Report 2016, Shenzhen currently ranks 15th out of 35 large and medium-sized cities in China (from best to worst) on the Pollution Discharge Index, 2<sup>nd</sup> on the Air Pollution Index, 19<sup>th</sup> on the Water Pollution Index, and 30<sup>th</sup> on the Solid Waste Index (Zhu et al., 2016). As early as 2007, Shenzhen established its EPPE system to address these problems, and has continuously revised and improved the institutional design over the past decade. This makes it an outstanding but also representative case to understand the making and implementation of local environmental policy in China.

In a previous study, some of the authors in this paper assessed the administrative practice and effectiveness of Shenzhen's EPPE and found several shortcomings (Liu et al., 2016b). For example,

many of the indicators are overly subjective; and although they require further devising, in the process of establishing scores, there is no real dialogue among responsible parties about what constitutes good evaluation, good information, good weighting and appropriate interpretation (Liu et al., 2016b). In several cases, they also found a mismatch between the duties imposed on public authorities and the power instruments actually at their disposal to remedy pollution problems (Liu et al., 2016b). Haggling over data and information among various departments also hinders effective cooperation in the administration of the system (Liu et al., 2016b). Meanwhile, data show that Shenzhen's environmental quality has only improved slightly with the implementation of the EPPE system, despite large amounts of money being invested (Liu et al., 2016b). All these problems argue for the necessity of analyzing how this insufficiently effective – or at least unsatisfactory – policy came into being, and what can be done to improve it.

In this article, we analyze the evolution of the Shenzhen EPPE and interpret its policy dynamics with the aim of producing a more general understanding of local environmental policy making and public sector performance management in China – i.e., what are the drivers and logic of local environmental policy making?

The rest of this paper is organized as follows. Part 2 reviews relevant literature on this topic. Part 3 proposes an analytical framework based on the "Problem-Politics-Policy" streams of the multiple streams approach (MSA) developed by Kingdon (1984). Part 4 introduces the Shenzhen EPPE system and its changes from 2007 to 2015. Part 5 analyzes the underlying factors of the above-mentioned policy dynamics. Part 6 makes concluding remarks and puts forward policy suggestions.

## 2. Literature review

Performance evaluation has a long history in governance. The earliest relevant record dates to the 1800s, when Scottish cotton mill workers were rated on performance at the end of each working day (DeVries et al., 1981). More relevantly, the introduction of new public management principles in the 1980s promoted the use of sophisticated performance evaluation methods for employees in the public sector, particularly in the United States (Eccles, 1991; Hood, 1995). Through strategic use of performance information,



**Fig. 1.** The location of Shenzhen in China and its municipal administrative divisions.

performance management aims to create a more efficient, effective and accountable public sector. For example, the 1978 Civil Service Reform Act of the United States proposed implementation of pay-for-performance for federal managers, linking appraisal results to remuneration (Rubin, 2011).

Today, performance management is considered an indispensable element of a modernized public sector (Bouckaert et al., 2000; OECD, 2000), although there are still concerns and problems (Bouckaert and Peters, 2002). First, no performance measurement technique can accurately gauge all relevant activities and achievements (Gao, 2015a; Meier and O'Toole, 2012). As such, performance measurement is labelled as one of the three top issues in contemporary public management (Behn, 1995). Second, gaming is nearly impossible to prevent in any performance management system (Hood, 2006). Third, inadequate performance management can have adverse effects on policy implementation (Bouckaert and Peters, 2002).

Nonetheless, performance management has become a common tool of contemporary public sector reform in a number of countries within the OECD. Almost all OECD countries have implemented mandatory performance assessments for central government employees (OECD, 2011). A natural, corollary question then is whether this has improved the performance of evaluated subjects. On this question, the existing literature has not arrived at a consensus. For example, Andersen (2008) examined the effect of performance management reforms in Danish public schools on the achievements of lower secondary students and found no or very small effects as measured by average exam scores, but highly significant effects on inequality between students with low socioeconomic status at reforming schools and those at similar non-reforming schools. Grosso and Ryzin (2012) showed that citizen satisfaction and performance perceptions were more favorable after performance reforms in the United Kingdom's National Health Service. But Pearce and Perry (1983) and Oh and Lewis (2009) both found that pay-for-performance may in fact decrease motivation among public sector employees in the American federal government.

Compared with this relative abundance of research in developed countries, there are far fewer studies of performance assessment in developing countries (Gao, 2015a). However, there have been instructive studies, such as Graves and Dillery (2009), which examined funding compliance measurement reform in four South African municipalities and found that reform measures did not enhance funding compliance anywhere. Information shortfall prevented the achievement of funding compliance requirements and hindered performance assessment. And in his study, Hezekiah (2012) suggested that although the performance appraisal system introduced in the Tanzanian public sector had been beneficial, it still fell short of expectations.

Over the past three decades, the implementation of performance-oriented management reforms in governments around the globe has driven an explosive growth of scholarly interest (Bouckaert and Halligan, 2007). Scholars have tried to investigate performance management in the public sector from various perspectives, such as the reasonableness of performance measurement methods (Chang, 2007), the theoretical and empirical effectiveness of performance management (Arnaboldi et al., 2015; Liu et al., 2016b), the impact of perceived fairness of performance appraisals on intrinsic motivation (Kim and Rubianty, 2011), and comparisons of different performance management systems across countries (Kuhlmann, 2010). Gao (2015a) presented an up-to-date and comprehensive review of this topic, examining practices, themes, lessons, and challenges, and discussed the prospective trends in public sector performance management.

Despite this growing literature, attention to environmental management has been relatively scarce. Most studies concerning

environmental performance in the public sector focus on the environmental auditing aspect of their operation (Ramachandra and Bachamanda, 2007; Ramos et al., 2009; Rika, 2009). Only Lundberg et al. (2009) developed an environmental performance evaluation framework, for the management of the Swedish Rail Administration using frameworks of causal-chain, pressure-state-response, and management-by-objectives. With respect to China, Liang and Langbein (2015) found that during 2006–2010, the performance management system reduced only air pollution while water pollution and soot emissions remained unaffected. Therefore, even in the centralized governance of China, compliance with a high-stakes reward for measured performance is not universal (Liang and Langbein, 2015). With 2000–2009 data, Wu et al. (2013) found city governments' spending on environmental improvements is uncorrelated with the odds of cadre promotion, local GDP growth and land prices. If environmental quality were explicitly linked to a cadres' chances of promotion, or affected land prices substantially, city-level public investment in environmental improvement would likely rise (Wu et al., 2013).

Additionally, while a series of studies have investigated the performance measurement of cadre personnel at the national level in China (Gao, 2015b; Jing et al., 2015; Liu and Li, 2016), few have examined performance management at the sub-national level; this is an important gap in our understanding of the country's local governance. This article tries to address these abovementioned issues through a systematic analysis of the evolution of the Shenzhen EPPE.

### 3. Research methodology

The first author worked for the SHSEC, and was a participant in the development of the Shenzhen EPPE system during 2011–2013; this tenure provided first-hand experience of policy practice, and especially knowledge of internal policy documents to which access has been restricted outside of the system. Indeed, this latter kind of difficulty has been a primary obstacle for public policy research (Gao, 2009). Many public administration studies resort to the analysis of government documents to interpret the intention and design of policymaking (Ricciucci, 2010). This method is particularly useful in China because of the difficulty of conducting relevant interviews and the importance of the policy documents themselves (Chan and Gao, 2013; Chan and Suizhou, 2007). Therefore, besides empirical observation, the research in this paper draws upon a series of key policy documents, as listed in Table 1.

First, we dissect the first annual evaluation scheme of 2007 to outline the Shenzhen EPPE system. Second, through one-by-one document comparisons, we examine how the system developed from 2007 to 2015. Third, we explain the drivers of the system change based on MSA. On the one hand, changes to the Shenzhen EPPE reflect the complexity of performance management – i.e., the difficulties of designing and implementing an equitable, reasonable, feasible, and effective evaluation system; on the other hand, it shows the multiplicity of motivations and considerations of policymakers. In addition, the design of the indicators system and management policies every year is at the discretion of policymakers. In this sense, annual policymaking is actually a new policy formulation process instead of the making of routine adjustments. Therefore, the MSA framework provides a useful guide to interpret the dynamics driving the policy evolution of the Shenzhen EPPE (Kingdon, 1995). The MSA, widely applied in public policy research (Jones et al., 2016), regards policy outputs as the result of concurrent effects of three independent streams – problem, politics, and policy – and strategic actuation by policy entrepreneurs.

Fig. 2 shows the analytical framework used in this study. Based on the three streams MSA framework and empirical observations,

**Table 1**

The main policy documents that outlined and established the Shenzhen EPPE.

Year	Document
2008	Trial Method for Shenzhen Environmental Protection Performance Evaluation
2008	The Implementation Plan of Shenzhen Environmental Protection Performance Evaluation (2007)
2009	The Implementation Plan of Shenzhen Environmental Protection Performance Evaluation (2008)
2010	The Implementation Plan of Shenzhen Environmental Protection Performance Evaluation (2009)
2011	The Implementation Plan of Shenzhen Environmental Protection Performance Evaluation (2010)
2012	The Implementation Plan of Shenzhen Environmental Protection Performance Evaluation (2011)
2013	The Implementation Plan of Shenzhen Environmental Protection Performance Evaluation (2012)
2013	Shenzhen Ecological Civilization Construction Evaluation System (Trial)
2014	The Implementation Plan of Shenzhen Ecological Civilization Construction Evaluation (2013)
2015	The Implementation Plan of Shenzhen Ecological Civilization Construction Evaluation (2014)
2016	The Implementation Plan of Shenzhen Ecological Civilization Construction Evaluation (2015)

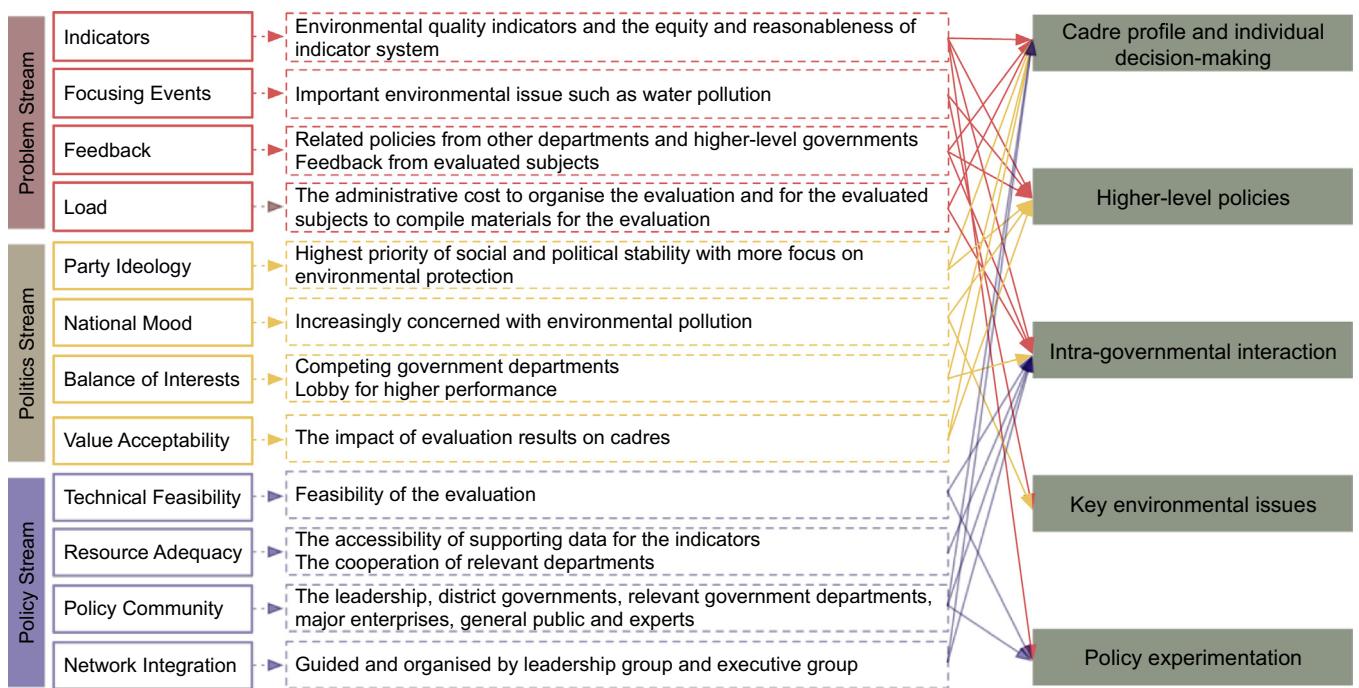


Fig. 2. The multiple streams analytical framework.

personal communications, and document analysis, we identified the multiple factors affecting policy changes of the Shenzhen EPPE and we found that the factors in different streams are interconnected rather than independent, as Kingdon (1984) originally argued. For example, the "Resource Adequacy" factor in the policy stream depends highly on the "Balance of Interests" factor in the politics stream. The "Policy Community" of the EPPE involves a variety of stakeholders, and a number of them are simultaneously data providers for the EPPE indicators and are evaluated by the EPPE. Therefore, ignorance of their interests would be an obstacle to the implementation of SHSEC evaluation. Furthermore, these factors and their interactions actually reflect more profound factors that affect policymaking, which we conclude are the underlying drivers of the Shenzhen EPPE. In addition, the politics stream in the Chinese context is the most influential and tends to dominate the other two streams because cadres, controlled by a top-down and monocentric bureaucratic system, have a near-monopoly in the making of public policy.

Therefore, we further synthesize the different factors indicated by the MSA framework and generalize five policy drivers, as shown in the farthest right column of Fig. 2.

#### 4. The shenzhen EPPE system

##### 4.1. Administrative system

The administrative structure of the Shenzhen EPPE, as shown in Fig. 3, is composed of three main organizational levels: A Leadership Group, led by the head of the Shenzhen Organization Department and the vice mayor; a Leading Office led by the head of municipal environmental agency (named Shenzhen Human Settlements and Environment Commission, SHSEC) and other relevant municipal departments; and an Executive Group composed of several officers and experts from the SHSEC. The Executive Group undertakes the design and the implementation of the evaluation, including designing indicators and specific working rules, organizing data collection and score calculation, and organizing consultation panels to assess the performance (always resulting in working reports) of the evaluated subjects. The Leadership Group and Leading Office are responsible for the approval of the annual evaluation scheme and results, and then for the submission of the results to the Municipal Party Standing Committee for final review and release (Leadership Group of Shenzhen EPPE, 2007).

Under the direction of the Shenzhen municipal government, the

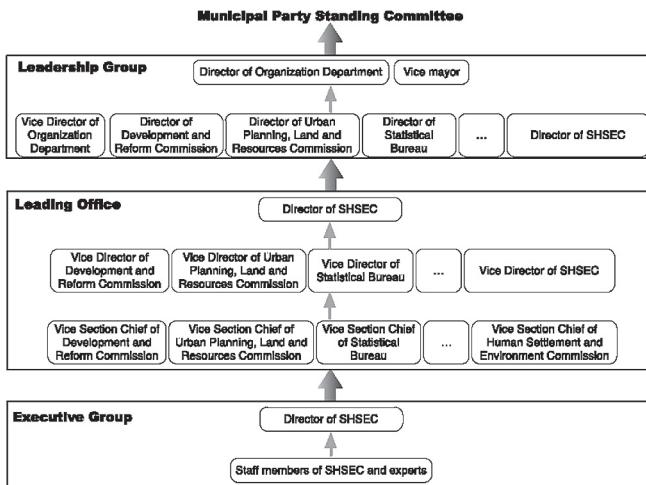


Fig. 3. Administrative organization chart of the Shenzhen EPPE.

evaluated subjects are defined for the top management and chief party and government officials of three different groups: district governments (the level below municipality), municipal departments, and major enterprises. In this respect in particular, the Shenzhen EPPE is innovative in China's environmental governance, which is usually the exclusive province of environmental agencies. It was not until 2015, with the passage of the "National Environmental Protection Law of China," that cadres from local governments were held accountable for environmental issues.

#### 4.2. Scoring method

For the three groups, including district governments, municipal departments, and major enterprises, there are different scoring systems, each consisting of a series of indicators, each of which has a maximum score of 100. The final score is the main assessment criterion for performance management. Table 2 shows the evaluation indicators for district governments in 2007.

For municipal departments and major enterprises, the evaluation system consisted of "PTCK Evaluation", "Pollution Reduction Evaluation" and "Work Performance". But for the Shenzhen Water Affairs Bureau (SWAB), the SHSEC and the Shenzhen Finance Commission (SFC), there were several more indicators, such as

"Centralized treatment rate of urban domestic sewage", "Recycling rate of urban sewage", and "The proportion of environmental protection in government expenditure" indicators (the second specifically for the SWAB and the third for the SFC). In practice, out of the three groups, the district government is the most important evaluated subject of the Shenzhen EPPE. The indicator system and evaluation method for district governments are also the most sophisticated and thus the focus of this paper.

For each 2<sup>nd</sup>-level indicator, a scoring method was defined and applied. For indicators that could be quantified directly, such as "The number of days with 'excellent' and 'intermediate' air quality" and the "Average river pollution index", the scores were calculated based on monitoring data and relevant environmental standards. For example, for the indicator of "Average river pollution index", if all the pollutants of the river sections in a district reached fifth-level national standard (GB3838-2002) or the average pollutant index of the district improved by at least 15% over the previous year, the district received a full mark of 5; if the average pollutant index of any river section did not reach the fifth-level standard, the district received a mark of 2.5 (if the district only had one river section, it was not liable for scoring); if the average pollutant index of any section did not reach the fifth-level standard and the average pollutant index of the district improved by less than 15% over the previous year, the score was calculated by the formula:  $(5/n)*(X/15)$ , where  $X$  is the increasing percentage of the average pollutant index and  $n$  is the number of river sections of the district (Leadership Group of Shenzhen EPPE, 2007).

For the indicators that could not be quantified directly, such as the "Public satisfaction rate" and "Working performance", different methods were applied, including public surveys, scores awarded by evaluators, and expert reviews leading to numerical scores. For example, in the indicator "Working performance", the total score of 20 was divided into 5 parts, including "Working plan of last year" (10%), "Implementation of the working plan" (35%), "Working effect and highlight" (35%), "Public complaint resolution and major environmental accident treatment" (10%), and "Analysis of current problem and working arrangement of next year" (10%). A panel of 35 members, consisting of party representatives, deputies of the local people's congress, members of the local people's political consultative conference, environmental experts and residents of different districts, were organized and trained to provide scores based on the above criteria (Leadership Group of Shenzhen EPPE, 2007).

**Table 2**  
Evaluation indicator system for district governments, 2007.

No. 1 <sup>st</sup> -level indicator	2 <sup>nd</sup> -level indicator	Weighting factor
1 Environmental indicators compliance and assignment accomplishment (80)	The number of days with "excellent" and "intermediate" air quality	5
2	Average river pollution index	5
3	The proportion of environmental protection in government expenditure	5
4	ERI <sup>a</sup> (not evaluated for 2007)	(5)
5	Public satisfaction rate (PSR)	15
6	Environmental law enforcement	10
7	Pollution Reduction Evaluation <sup>b</sup>	20
8	PTCK Evaluation <sup>c</sup>	20
9 The comprehensive performance of environmental protection work (20)	Working performance	20

<sup>a</sup> ERI: Ecological Resources Index is an indicator developed by the SHSEC in the "Technical Manual of Ecological Resources Measurement of Shenzhen", which consists of four indices and sub-indices, including vegetation coverage, water surface coverage, construction land and unused land.

<sup>b</sup> Pollution Reduction Evaluation is another performance evaluation system of the SHSEC for local pollution abatement.

<sup>c</sup> PTCK: Pollution Treatment and Clean-Keeping is another performance evaluation system for the annual pollution abatement projects of the city, addressing what projects should be constructed, which organizations are responsible and what percent or what sub-projects should be finished within the year.

Source: Leadership Group of Shenzhen EPPE (2007).

#### 4.3. Implications of scores

According to the “Trial Method for Shenzhen Environmental Protection Performance Evaluation” document issued in 2008, in different evaluated groups, results were classified into three categories: “excellent”, “intermediate”, and “poor”, according to which corresponding awards or punishments were applied. A “progress award” would be conferred for the “intermediate” ranking, indicating significant progress over the previous year. There were also veto conditions. In 2007, the evaluated subject was not rated as “excellent” if one of the following occurred: a) non-completion of the annual key tasks in environmental protection; b) mass incidents because of environmental pollution and ecological damage; c) PSR below 80% and a last-place ranking (Leadership Group of Shenzhen EPPE, 2007).

A “poor” rating was given under any one of the following conditions: a) the annual pollution reduction task was not fulfilled; b) the “PTCK Evaluation” was “poor”; c) environmental violations due to derelictions in regulation that caused serious consequences, or serious environmental incidents due to poor management; d) prominent environmental problems not successfully treated for two years; e) public criticisms of the provincial or central government due to environmental pollution or ecological damage; f) censure from the District People’s Congress or the government at higher levels for environmental protection work; g) environmental problems supervised by national ministries or provincial government unresolved within prescribed time limit; h) violation of environmental laws and regulations and punishment by party and government, or investigation for legal responsibility (Leadership Group of Shenzhen EPPE, 2007).

As shown in Fig. 3, after the approval of the Municipal Party Standing Committee, the Leadership Group then announced the final evaluation results, which were also recorded in the cadre archives of the Shenzhen Organization Department. For those receiving “excellent” and “progress award” ratings, the municipal Party committee and government circulated notices of praise. For recipients of “poor” ratings, notices of criticism were circulated. In addition, reprimands were issued to the immediate supervisors of poorly-rated cadres, who then had to issue public apologies, and were subject to a promotion freeze of two years. If evaluated as “poor” for two consecutive years, these supervisors were transferred to other positions or non-leadership positions (Leadership Group of Shenzhen EPPE, 2007). However, the final score and even the full ranking were not open to public. Only a portion of the information on ranking could be accessed publicly.

So far, no evaluated cadres have been promoted or demoted just because of the result of the EPPE process. But several cadres have received “verbal warnings” from the municipal government, which in the prevailing political climate is considered to be a serious measure. To a large extent, the control of cadres in China is informally at the discretion of higher leaders while the role of the EPPE is at most a point of reference. The more direct impact of the EPPE is on the impression municipal leaders have of these cadres and on their reputation among their peers, both indirect factors for their political careers and thus incentives for local environmental management. Nevertheless, even such indirect impacts cause anxiety on the part of evaluated cadres, creating a kind of norm if not a consistently effective institution (Liu et al., 2016b).

#### 4.4. Evolution during the 2007–2015 period

Since its launch in 2007, the Shenzhen EPPE has developed towards a more stable and at the same time more sophisticated system. Fig. 4 shows changes in the performance indicators for district governments, where the reference value of a new indicator

is 1, with an addition of 1 for any substantive change and a decrease to 0 if the indicator was cancelled.

Table 3 shows the 2015 EPPE indicators for district governments.

Compared with 2007, the system has been enlarged to include four 1<sup>st</sup>-level indicators with fifteen 2<sup>nd</sup>-level indicators and twenty 3<sup>rd</sup>-level indicators. Out of all the indicators in 2007, only “PTCK Evaluation” and “Pollution Reduction Evaluation” were retained. The scoring method and the content of the two indicators have also been altered. In other words, after 9 years of development, the Shenzhen EPPE has undergone systematic changes.

## 5. Results

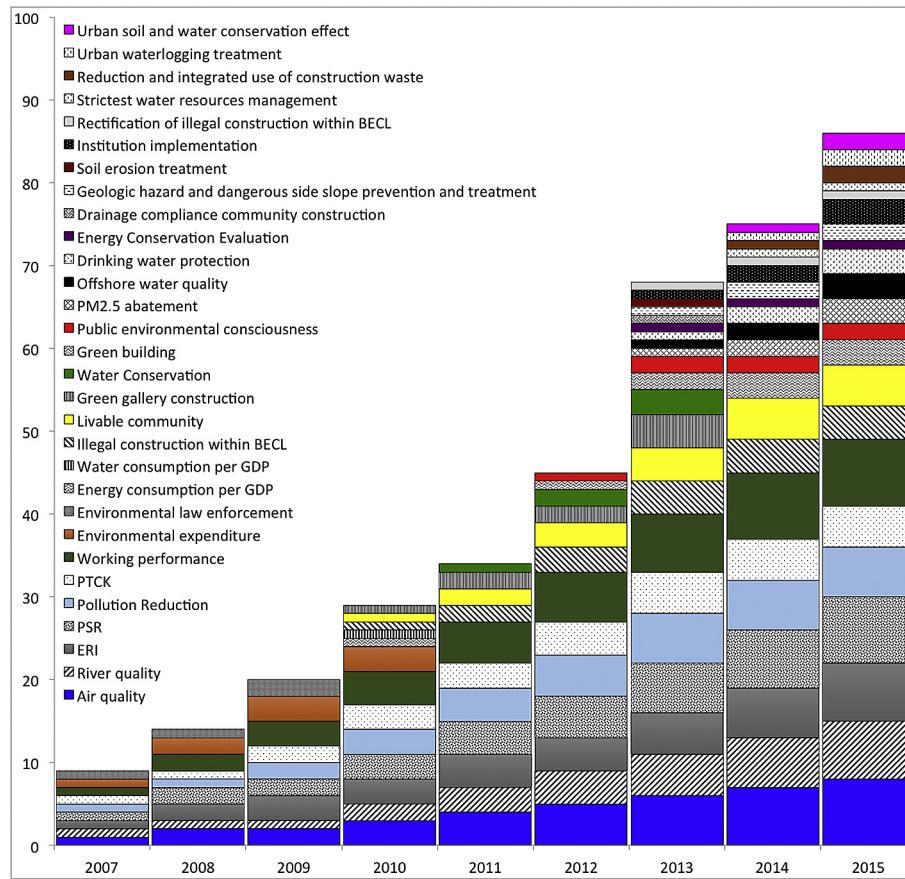
As shown in Fig. 2, under the rubric of the “Problem-Politics-Policy” MSA framework, a series of fragmented elements were identified as influencing policy changes. Further, these elements were classified into five underlying factors according to the policy and political processes of the design and implementation of the Shenzhen EPPE, including cadre profile and individual decision-making, higher-level policies, intra-governmental interactions, key environmental issues and policy experimentation.

### 5.1. Cadre profile and individual decision-making

The top leaders in China’s government have absolute authority in decision-making. Almost all existing studies analyzing local governments in China identify the top leader as the most important factor affecting the sustainability and vitality of innovation (Yang, 2013). For this reason, the personal will of cadres had a significant impact on the Shenzhen EPPE. A typical example was the determination of evaluation results. As mentioned above, the “Trial Method for Shenzhen Environmental Protection Performance Evaluation” (2007) was defined as the supporting law for the Shenzhen EPPE, but the application of the evaluation results in the later annual scheme still varied from year to year. To some extent, this undermines the authority and credibility of laws – i.e., since the annual scheme can discretionally set conditions for the determination and application of evaluation results, it is no longer necessary for the municipal government to issue a formal statute.

In the administrative structure of the Shenzhen EPPE system, which remained consistent from 2007 to 2015 excepting personnel changes, the Leading Office is akin to a nominal organization. The Leadership Group holds the right for final review, but for most of the time they are passive information receivers: they hear reports from lower officials and provide suggestions where necessary, but rarely intervene proactively. Before submission to the Leadership Group for review, the annual scheme always experienced numerous revisions. Generally, most of the content were admitted in the final step. Therefore, the Executive Group, and particularly the leaders (one section chief and two directors from SHSEC), plays the central role in the making and implementation of the EPPE system. For example, the scoring of ERI has been altered frequently. ERI is a quantitative indicator for measuring regional ecological conditions, so scoring is reasonably straightforward. However, in recent years, one of the top SHESC leaders became particularly concerned about the application of this indicator and the scoring method became subject to frequent revisions, with subordinates duly falling in line.

The motivations and incentives underlying individual cadre decision-making are three-fold. The first dimension is the intrinsic sense of self-discipline and duty incumbent upon public servants, which should motivate cadres to make rational, fair, and effective decisions. Indeed, there has been significant improvement in the equity and effectiveness of the system in recent years. For example, in 2010, the scoring process for “Average river pollution index”



**Fig. 4.** Changes in the indicators for district governments, 2007–2015.

began to examine not only the contemporary quality of the river but also the change in quality over the past year. In addition, to improve objectivity, independence, and the operability of performance evaluation, the annual scheme has become much more substantial and concrete in terms of the scoring rules. However, occasional system changes were more or less arbitrary. For example, for the new indicator “PM<sub>2.5</sub> compliance” in 2013 and “Waterlogging treatment” in 2014, scoring methods was altered in the following annual scheme, with no justification. There were no apparent scientific or rational bases for the decision-making. The arbitrariness undoubtedly reduced working efficiency, which in a larger context could weaken environmental governance and exacerbate the waste of limited government resources.

The arbitrariness reflects the second dimension, which can be called “innovation for innovation’s sake”, without few if any practical improvements. Innovation, despite all its ambiguity and breadth for interpretation, has become a central political priority for China’s socio-economic development and thus administrative management (He, 2016). This creates pressures for administrators to demonstrate novelty in their management, even if changes are unnecessary or ultimately ineffective. Frequent changes to the use of the indicator PSR are an example in the Shenzhen EPPE, despite a lack of improvement in equity or efficiency. In 2009, a coefficient for the scoring of “The environmental law enforcement” and “Pollution Reduction Evaluation” was adopted to reflect the differences in their respective workloads; this was meant to increase equitability but was ultimately cancelled in 2010.

The third dimension of individual cadre decision-making arises from their social networks. Due to the political stakes of the evaluation, private lobbying for a more favorable system is inevitable

and has been frequently observed. However, the ways in which these lobbies have influenced the annual scheme is not known publicly.

### 5.2. Higher-level policies

Due to the top-down political structure, a basic rule of policy-making in China is that lower-level policies do not contravene higher-level policies, which are more authoritative and in principle the guidance for the former. In addition to improving the efficiency and effectiveness of urban environmental management, as Gao (2009) pointed out for China's performance management system, an important function of the Shenzhen EPPE is to ensure that the city meets the demands of higher-level policies. Therefore, the development of the Shenzhen EPPE uses relevant higher-level laws and regulations as reference points and foundations. For example, in 2013, the Shenzhen EPPE was updated and renamed as the “Eco-Civilization Construction Performance Evaluation”, as the concept and term of “eco-civilization” was highlighted as central during the 18th Party Congress in 2012. Meanwhile, eco-civilization was defined by the former president Hu Jintao to comprise four aspects: geographical space optimization, resource conservation, ecosystem and environmental protection, and corresponding institution building (Xinhua News Agency, 2012). The 1<sup>st</sup>-level indicators in the 2013 EPPE scheme were revised to accord with these new ideals and guidelines.

### 5.3. Intra-governmental interactions

The impact of intra-governmental interaction has two chief

**Table 3**

Evaluation indicator system for district governments, 2015.

No.	1st-level indicator	2nd-level indicator	3rd-level indicator	Weighting factor
1		Air quality	Air quality compliance	3
2			PM <sub>2.5</sub> abatement <sup>a</sup>	2
3	Ecological and environmental quality improvement	Water quality	River and offshore water quality compliance and improvement	7
4			Drinking water protection and quality improvement	3
5		Ecological resources	The variation of ERI, ecological forests and bare ground	4
6		PTCK	PTCK Evaluation	10
7		Energy conservation and consumption reduction	Energy Conservation Evaluation	10
8		Pollution reduction	Pollution Reduction Evaluation	10
9	Resources conservation	Integrated use of resources	The completion of the “strictest water resources management”	3
10			The reduction and integrated use of construction waste	2
11		Green building development	Green building construction	5
12		BECL protection <sup>b</sup>	Illegal construction within BECL	5
13			Rectification of illegal construction within BECL	5
14			Geologic hazard and dangerous side slope prevention and treatment	3
15	Ecological space optimization	Ecological damage repair	Urban soil and water conservation effect	2
16		Drainage of stagnant water project construction	Urban waterlogging treatment	2
17		Livable community	Livable community construction	5
18		Eco-civilization institutional building <sup>c</sup>	Implementation and innovation of eco-civilization institution	4
19	Eco-institution improvement	Ecological culture cultivation	Public awareness of eco-civilization	2
20		Working performance	Working performance of eco-civilization construction	10

<sup>a</sup> PM<sub>2.5</sub>: Particles less than or equal to 2.5 μm in diameter.<sup>b</sup> BECL: Basic Ecological Control Line is an area delimited by the Shenzhen municipal government for ecological protection, in which any industrial activity is strictly forbidden.<sup>c</sup> “Ecological civilization refers to material, spiritual and organizational achievements in following objective laws of harmonious human, social and natural development. It is an ethical morality and ideology which realizes harmonious co-existence and sustainable development both among people and between them and nature and society, reflecting the progress of civilization.” (Zhu, 2016).

Source: Leadership Group of Shenzhen Ecological Civilization Construction Evaluation (2015).

aspects. The first is procedural. To forestall bias in favor of or against evaluators and subjects, before the finalization of the system, the evaluation scheme is sent to every subject requesting their comments and suggestions – usually for several rounds. This is meant to help designers understand potential biases and conflicts of interest, to make the necessary and practical compromises between participants, and to facilitate communication and interaction between evaluators and subjects. The Executive Group evaluates the rationality of the feedback and decides whether to accept them or to mandate further revisions (and which revisions). However, the impact of this feedback process, especially for district governments, is relatively limited because the Executive Group has full autonomy in whether or not to adopt a given suggestion. In an attempt to remedy this problem, a recent change from 2015 allowed for dissenting subjects to apply for their scores to be re-evaluated, even after the scores have been officially finalized.

The second is informal. Although the Shenzhen EPPE is officially a municipal level policy, the design and implementation of the system is actually and informally tasked to the SHSEC, which in the city's bureaucratic hierarchy is equal with other municipal departments. As shown in Fig. 3, all the departments relevant to environmental governance, including the Shenzhen Development and Reform Commission (SDRC) (responsible for economic development, public project approval, energy policy, and low-carbon development), the Shenzhen Urban Planning, the Land and Resources Commission (SUPLRC) and the Shenzhen Statistic Bureau (SSB), have been successively brought into the Leadership Group and Leading Office, and also subjected to the evaluation process.

Therefore, to coordinate different departments and to justify indicator-setting from their perspectives, policymakers had to find relevant policy documents to support the proposal of indicators.

For example, when setting the indicator about waterlogging treatment in 2015 – which fell within the brief of the SWAB – the Executive Group wanted to find official policy documents that required or suggested waterlogging treatments to prove to the SWAB that the indicator “Urban waterlogging treatment” was based on official documents instead of personal discretion. Extracting indicators based on government policy documents is a reasonable and safe method. But in reality, this process was a difficult, even discursive, process: the Executive Group first proposed an indicator, which lower-level officers were then tasked with finding existing and relevant policy precedents to support. Overall, although policymakers wanted to find full support from existing policies of different government departments and their higher-level departments, there were too many policies at different levels; the attempt to create a justification from an exhaustive survey of precedents was a practically impossible task. Therefore, after finding the most important (often national) policy precedents, the others that had also been adduced as justifications were usually the simple products of random selection.

On the other hand, the evaluation work needs the cooperation of different departments to obtain necessary information. Such cooperation is not easy to achieve because government departments implicitly consider each other as potential competitors. Every department has an incentive to demonstrate its effectiveness to higher-level officials, with recognized department leaders receiving a higher chance of promotion. In this sense, each department tends to retain exclusive access to certain information, thereby limiting the information the SHSEC has to conduct evaluations (Liu et al., 2016b). Additionally, the other departments may not have sufficient motivation to pay administrative costs to cooperate on the EPPE.

An example of this potentially internecine dynamic in the Shenzhen EPPE was seen when the indicator “Energy consumption per unit of GDP” was included in 2010. It was included for district governments but then promptly cancelled in 2011. Later, in 2013, another indicator – “Energy Conservation Evaluation” – was added, which was actually an independent evaluation system managed by the SDRC; the EPPE only takes its final scores. In 2013, “CO<sub>2</sub> emissions intensity” was considered an important indicator but was subsequently eliminated. All positions related to energy and carbon emissions are in the charge of the SDRC, so its non-cooperation obstructed the design and calculation of relevant indicators. The SDRC had even been ranked last in one of the annual evaluations for municipal departments. In later years, the SHSEC met many obstacles dealing with affairs in which SDRC had a say.<sup>1</sup> Consequently, and perhaps not coincidentally, it was found that the SDRC rose to first place in the following three years. Additionally, inter-departmental interactions are further burdened by the amount of time and resources needed to arrange onsite presentations and working reports, which are produced biannually.

#### 5.4. Key environmental issues

The EPPE is aimed at advancing policy implementation for environmental issues of pressing public concern. For example, in 2012, PM<sub>2.5</sub> pollution became a widely discussed topic, fueled by public concerns over the severe haze in Beijing and other urban centers. Consequently, the Shenzhen EPPE scheme in 2013 added the level of PM<sub>2.5</sub> pollution as a new indicator. Water pollution has also become a salient topic, and the scoring method of the river quality indicator has changed frequently in recent years to focus on the most serious pollutants and to drive more rigorous action on pollution abatement. For Shenzhen's environmental protection, river pollution has been one of the most persistent and difficult issues to address (Liu and Ma, 2011). Almost none of the major rivers in the area have met the lowest water quality standards over the past decade. The government has invested nearly ¥30 billion in river restoration, but to little effect (Qu, 2013). In 2013, Shenzhen's largest river, the Maozhou, whose basin includes 3 million people, 22,000 enterprises and generates ¥220 billion GDP per year, became the most polluted river in the entire Pearl River Delta Economic Zone. The NH<sub>3</sub>-N in one heavily populated section of the basin exceeded the environmental standard by over 23-fold (Xie et al., 2013).

Shenzhen has been under growing pressure from the provincial government to address this problem, especially given its trans-boundary externalities. The consistent failure to adequately contain and remediate river pollution reveals one weakness of the Shenzhen EPPE: a lack of responsiveness to public concerns, as officials tend to be more focused on the incentives provided by higher-level authorities. It is only when these two align that urgent action is taken, but by then remedial measures often become more difficult and costly to implement, and the public has become less confident in the mechanisms of governance. The PSR was meant to improve responsiveness to public concern. And although the PSR has evolved from an independent indicator to an adjustment coefficient that has a much larger influence on the final score, it remains generally ineffectual, and its sampling, survey and calculation methodology have not been made public.

#### 5.5. Policy experimentation

Another important feature in the evolution of the Shenzhen

EPPE is its policy experimentation: i.e., policies are first implemented at a small scale and then gradually scaled upwards. From 2007 to 2015, the numbers of indicators, evaluated subjects and operational rules have all increased substantially. For example, the organizations taken into the evaluation have been adjusted and have increased from year to year. Since 2012, evaluated enterprises have included both state-owned and major private business. Since 2014, municipal departments have been classified into type A and type B according to their administrative levels. Between 2007 and 2015, the number of evaluated subjects increased from 28 to 39, including: all 10 district governments; 17 municipal departments, accounting for nearly 40% of the city total; and 12 enterprises. This policy experimentation strategy is of a piece with China's broader approach to governance: pilot experiment first, large-scale promotion if successful (Mei and Liu, 2014; Ross et al., 2016).

Through such policy experimentation, policymakers have been able to improve policies step by step; additionally, testing allows them to anticipate and forestall policies that might create public controversy and therefore social instability, which remains the overriding concern of governance in China. However, there are still problems with this strategy when applied to the EPPE. First, as a yearly evaluation, all the tasks - including data collection, scores calculation, results finalization and the announcement of the following year's evaluation scheme - must be finished within one year. This means there is little time for the evaluated subjects to react and arrange their work for the coming year, if system changes are to be significant. Consequently, gaming by departments and officials becomes difficult to avoid (Gao, 2015b). Second, with high priority on municipal government agendas and serious consequence for low scores, uncertainty about what the evaluation scheme will be the following year is likely to generate anxiety among evaluated subjects. As Liu et al. (2016b) pointed out, an effective communication channel between the evaluator and the evaluated is lacking. The frequent changes may imply that the evaluation process is more pro forma than substantial.

At the national level, public policy evolution in China has benefited from learning from previous experiences, local practice and expert knowledge (Ngar-yin Mah and Hills, 2014; Zhao and Wu, 2016). However, at the local level, which has been the focus of this paper, only previous experience has been observed to inspire policy evolution in the form of the policy experimentation strategy. In the Shenzhen EPPE, policymakers declared that experts were already part of the Executive Group, but in reality, they were only staff members from the subordinate organizations of the SHSEC. In their interaction with higher-level officials, they actually became the implementer of cadres' personal ideas. In addition, the practice of district governments generated little grist for policy change, since every year they were forced to expend their limited resources in the struggle to attain higher evaluation scores. Thus, generally speaking, for the district governments, taking the initiative in policy innovation is not likely to occur. The policy learning by municipal governments from district governments is consequently hard to observe. To some extent, China's local officials impose tighter control over public policymaking because they face a much less diverse and a much riskier decision-making situation than the central government; at the same time, in any situation, an effective and equitable performance management system is hard to develop (Heinrich, 2002).

#### 6. Conclusions

In order to create more effective environmental policy implementation, performance management has become widely used in China's bureaucratic system. Taking Shenzhen as a case, this paper empirically tracked the evolution of its EPPE system from 2007 to

<sup>1</sup> Personal communication with a chief staff of SHSEC.

2015 and analyzed the driving factors of policymaking with the "Problem-Politics-Policy" framework of MSA. Finally, five underlying drivers were distilled and analyzed.

The first dominant factor in decision-making of the EPPE was the profiles and individual decision-making of cadres. Cadres were motivated by professional obligation to make an equitable, responsive and effective policy system. They also faced a rational choice to better tailor their performance to impress higher-level cadres, who hold significant sway over their career prospects, when local institutional innovation has become a kind of political zeitgeist in Chinese governance. In this process, relatively high-level cadres have more discretion in personal choice while lower-level cadres have to behave in a way that is more concerned with pleasing their superiors by frequently revising the EPPE to assure substantial work has been done. Therefore, a number of unnecessary changes were observed in the evolution of the Shenzhen EPPE, many of which actually undermined the sustainability and credibility of the system as well as increasing administrative costs.

Secondly, under China's top-down political system, the Shenzhen EPPE takes important higher-level policies as its basic guide to ensure legitimacy and authority.

Thirdly, being situated as a municipal-level policy, the Shenzhen EPPE takes relevant policies from different municipal departments as references to facilitate cooperation among these departments – which has proven difficult. The different departments are more competitive than cooperative with one another, so other departments may not want to cover administrative costs to cooperate on a job that is credited to the SHSEC. Such interactions between departments inevitably impair policymaking and implementation.

Fourthly, the degree of urgency over an environmental issue is also relevant, which reflects the main intention and function of the EPPE system: to solve environmental problems of public concern. However, the responsiveness of the EPPE to public opinion in such problems has been lacking.

Finally, in the evolution of the Shenzhen EPPE, a policymaking strategy typical of China's governance more generally can be observed: policy experimentation. This is used to mitigate risk through adjustments while implemented at a small scale, with successes progressively scaled upwards.

The multiple drivers identified in the evolution of local EPPEs complicate policymaking by placing it within a complex political context that can distort the efficacy and intention of a performance management system (Liu et al., 2016b). Improving this policy tool means reducing the complexity as much as possible, which requires political commitment and the perseverance to have a more serious and open decision-making process (Heald, 2003). For example, the EPPE could be incorporated in the Organization Department agenda with the environmental agency participating as a consultant instead of executor. Third-party assessment, which has long been realized in advanced economies, could also be brought in (Dubnick and Frederickson, 2010). Without such changes, any improvement in the system would be confined within the invisible boundaries set by the multiple factors, which would further increase administrative costs.

Environmental management is a result of institutional arrangements at different levels. The improvement of local EPPEs and similar policy tools in local environmental governance therefore does not depend only on technical improvements at the operational level, but also on institutions at the constitutional level. This means helping local governments balance policy targets for economic growth with those for environmental protection, as well as incentivizing them to adhere to more serious and accurate measurements of environmental performance.

Still, several limitations remain in this research. First, in the design of the system, several cadres expressed a wish to narrow

differences among the scores for various subjects in order to maintain "harmony", which may constitute a factor affecting policymaking. However, due to fact that the actual score of each evaluated subject in any given year is usually classified, there is insufficient evidence to support this assumption. Second, this study would be improved if it had been complemented by interviews with key decision-makers. But unfortunately, such interviews are difficult to make, for a variety of practical as well as political reasons. Even ordinary officials taking part in the work refused to provide relevant materials or be formally interviewed about this issue, which they deem to be a sensitive matter. So far, there are still few studies about the factors influencing local environmental policymaking in China, especially the environmental performance management system. More specific and empirical case studies would advance understanding of the policy logic of China's local environmental management.

## Acknowledgements

This study was funded by Sichuan University under Grant skqx201605. We sincerely appreciate the very helpful and insightful comments from anonymous reviewers and Dr. Rodrigo Lozano.

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