

Key Points

- Targets established in the 11th Five-Year Plan (2006–2010) of the People’s Republic of China contributed to remarkable environmental achievements compared with the previous plan: the goals of reducing sulfur dioxide, chemical oxygen demand, and energy intensity were achieved.
- Among the important factors considered to have contributed to the comparative success of the 11th Five-Year Plan are increased investment, greater focus, and strengthened accountability and enforcement.
- Despite these achievements, the mode of economic growth, which relies more on manufacturing than on services and more on investment than on consumption, still imposes substantial burdens on the country’s environment.
- The fundamental changes of the current mode of growth will depend on how quickly the government can overcome the country’s “rush to growth” approach to urbanization, the coal dominance in the energy structure, and the overdependence on administrative measures for environmental management.
- Against this backdrop, this brief recommends that the 12th Five-Year Plan (2011–2015) consider the following measures: (i) changing the price of resources and removing disincentives, (ii) expanding the use of market-based instruments to control pollution, and (iii) developing legal reform to clarify responsibilities and trigger cooperation.

JEL Classification: O44, Q56, Q58
 ISBN 978-92-9092-363-3
 ISSN 2218-2675
 Publication Stock No. ABF113572

Environmental Strategy for the 12th Five-Year Plan Period: What Can the People’s Republic of China Learn from the 11th Five-Year Plan?

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As the People’s Republic of China (PRC) is preparing its environmental strategy for the 12th Five-Year Plan (2011–2015),² this policy brief reviews the environmental performance of the relatively successful 11th Five-Year Plan (2006–2010) by comparing it with that of the 10th Five-Year Plan (2001–2005), which has been widely accepted as unsatisfactory.

In broad terms, the 12th Five-Year Plan is expected to continue the strategies that were successfully implemented during the previous plan, with the following enhancements:

- extensions of mandatory caps to cover two more important pollutants—ammonia in water and nitrogen oxides in air—in addition to sulfur dioxide (SO₂) and chemical oxygen demand;
- further improvements in living quality and standards by improving environmental management and strengthening protection of drinking water sources;
- promotion of green development with environmental protection; and
- more efforts to address international environmental issues such as climate change.

¹ The author would like to acknowledge Edgar Cua for providing inspiration and guidance in the preparation of this brief. The brief likewise benefited from the quality inputs of the consulting team who conducted the second country environmental analysis of the PRC, especially Ma Zhong, Wang Jinnan, Ge Chazhong, and Pan Jiahua. Several reviewers in ADB offered valuable comments, including Yi Jiang, Raymond Renfro, Yue-Lang Feng, and Fei Yue. External peer review was also provided by Chen Jining, Suzanne Giannini-Spohn, and Mark Kasman. Joy Quitazol-Gonzalez provided the editorial and design services to produce and disseminate this publication.

² The PRC released its 12th Five-Year Plan Outline in March 2011, but the environmental protection component of said plan is still under preparation and is expected to be approved by the end of 2011.

In examining how the 12th Five-Year Plan can leverage the lessons learned from the previous plan, this policy brief looks to needed improvements in macroeconomic policy in addition to specific environmental measures to support long-term gains.

The brief is based on the main findings and recommendations of the Asian Development Bank's (ADB) second country environmental analysis for the PRC, which is now in its final draft stage and scheduled to be published in the fourth quarter of 2011.

Environmental Performance during the 11th Five-Year Plan Period

The environmental performance of the PRC during the 11th Five-Year Plan period was a significant improvement over that of the 10th Five-Year Plan, even though the 2006–2010 period reported an average gross domestic product (GDP) growth of 10.5%, which was considerably higher than the 7.5% growth, a target set in 2006 for the 11th Five-Year Plan. Nearly 50% (9 out of 20) of the environmental objectives under the 10th Five-Year Plan were not met, while the 11th Five-Year Plan failed to meet only 2 of its 13 quantitative objectives—and those 2 were only minor

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shortfalls. Table 1 lists the results of the 13 environmental objective indicators under the 11th Five-Year Plan.

These environmental achievements were made despite the fact that economic development relied too heavily on industrial development and not enough on tertiary sector development, and thus was not conducive to environmentally sustainable development. A key objective of the 11th Five-Year Plan had been to restructure the economy in favor of a greater role for the tertiary sector, but this was not achieved to any significant degree—an outcome that was mentioned explicitly by Premier Wen Jiabao in his Report on the Work of the Government delivered at the Fourth Session of the 11th National People's Congress on 5 March 2011.³

Table 1: Primary Environmental Objectives and Achievements under the 11th Five-Year Plan (2006–2010)

Goal	Indicator	Objective	Result
1	Sulfur dioxide (million tons)	22.95	21.85
2	Chemical oxygen demand (million tons)	12.70	12.38
3	Ratio of recycled industrial solid wastes	> 60%	69.0%
4	Ratio of urban sewage treatment (secondary)	> 70%	75.25%
5	Ratio of sanitary disposal of urban solid wastes	> 60%	71.4%
6	Ratio of village environmental improvement	> 20%	Basically reached the indicators
7	Ratio of state-level nature reserves meeting national standards	> 25%	11.8%
8	Ratio of the water supply sources in key cities meeting national standards (in volume)	> 80%	73.0%
9	Ratio of sections of surface water bodies monitored by state-level monitoring stations having water quality below Level V	< 22%	18.4%
10	Ratio of sections of the seven largest rivers having water quality better than Level III	> 43%	57.3%
11	Ratio of coastal areas having water quality better than Level II	> 70%	72.9%
12	Ratio of key cities having air quality better than Level II for more than 292 days	> 75%	95.6%
13	Ratio of effective annual exposure to radiation for residents living adjacent to nuclear power plants lower than the threshold of national standard	< 10%	9.0%

Note: Those in bold are the unmet targets.

Source: People's Republic of China Ministry of Environmental Protection.

³ The premier noted the government's failure to meet two particular targets set in the 11th Five-Year Plan relating to the value added by the services sector and the sector's share of total employment, both of which remained relatively flat throughout the plan period.

Success Factors of the 11th Five-Year Environmental Plan

The significant environmental achievements of the 11th Five-Year Plan are especially remarkable because of the unsatisfactory environmental performance of the 10th Five-Year Plan, where it was the only sector plan that did not achieve its objectives. This served as a wake-up call to the government and fed a determination to not repeat the experience. The first PRC country environmental analysis⁴ concluded that some of the factors that contributed to the failure were

- (i) inadequate attention of local (subprovincial) governments to environmental protection,
- (ii) an overheated economy,
- (iii) low resource efficiency in the economy,
- (iv) an ineffective regulatory framework combined with weak supervision and enforcement,
- (v) lack of cross-sector coordination, and
- (vi) inadequate financing of environmental infrastructure combined with an ineffective fiscal system.

All of these issues except (ii) were explicitly addressed under the 11th Five-Year Plan, although the last two only partially.

A number of factors distinguished the government's approach to the environmental agenda under the 11th Five-Year Plan from the preceding plan, and is considered to have contributed to the comparative success of the environmental plan:

- **Increased investment.** Investment in environmental infrastructure significantly increased during the 11th Five-Year Plan.⁵ The planned amount (CNY1.53 trillion) represented an 80% increase over the previous plan, while the actual amount (CNY1.4 trillion) was 65% higher. Investments were made in capital equipment (most notably municipal wastewater treatment plants and industrial desulfurization equipment) and in capacity building (such as procurement of better environmental

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monitoring and enforcement equipment and facilities for environmental protection departments). The huge increase in investment is the main reason behind the significant achievements in municipal wastewater treatment capacity and SO₂ reductions in both the power and industry sectors. There is considerable room for further investment in municipal wastewater treatment, which presently has capacity to treat 75% of estimated flows. Moreover, additional investments will be required to upgrade many treatment plants from Class 2 to Class 1a or 1b, as planned under the 12th Five-Year Plan. However, control of SO₂ pollutants in the power and industry sectors may be nearing, or have already reached, its threshold.

- **Greater focus.** Previous environmental plans were criticized for being too ambitious and trying to achieve too many disparate goals, many of which were outside the direct control of the Ministry of Environmental Protection (MEP). The 11th Five-Year Environmental Plan was considerably more focused, with only 13 objective indicators compared with the 20 indicators included in the 10th Five-Year Plan. This sharper focus was supported by a significant increase in financial resources. The combination of these two measures seems to have greatly improved the plan's effectiveness.
- **Strengthened accountability and enforcement.** Responsibility for achieving the plan's objectives was delegated downward with decentralized accountability. MEP commenced the establishment of pollution reduction agreements with the provincial governments, making the provincial leaders accountable for their pollution management. Six regional supervision centers were established in 2006 to increase oversight of the environmental

⁴ ADB. 2007. *Country Environmental Analysis for the People's Republic of China*. Manila.

⁵ The significant investment in environmental infrastructure also contributed to the improved environmental quality during the Beijing Olympics and the Shanghai World Expo.

performance of subnational governments. Compliance monitoring of industrial enterprises was stepped up through a series of five campaigns entitled “Countrywide Special Environmental Protection Action to Punish Enterprises that Violate Law and Discharge Pollutants and Safeguard the Masses’ Health.” This focused particularly on

- (i) compliance of high-pollution and resource-based industries and those with high energy consumption;
- (ii) compliance of iron, steel, and arsenic-related industries;
- (iii) supervision and inspection of drinking water source protection zones;
- (iv) inspection of urban wastewater treatment plants for compliance with discharge standards; and
- (v) operation of landfill sites.

The 11th Five-Year Plan was not without its shortcomings. At the Sixth National Conference on Environmental Protection held in Beijing on 17–18 April 2006, Premier Wen Jiabao announced that, as part of its efforts to emphasize the quality of growth more than the quantity, the government intended to make three shifts in policy:

- (i) shifting from the previous approach, which stressed economic growth over environmental protection, to a new approach that pays equal attention to both;
- (ii) shifting from environmental protection that lagged behind economic development to environmental protection that is synchronized with economic development; and
- (iii) shifting from a dependence on administrative means to protect the environment to a more comprehensive approach that also uses legal, economic, and technical means to resolve environmental problems.

However, these strategic objectives were not fully realized during the 11th Five-Year Plan. Some progress was made—such as the elevation of the State Environmental Protection Administration to the ministerial level (MEP), with representation on the State Council—but far more needs to be done. For example, the mode of economic growth, which relies more on manufacturing than on services and more on investment than on consumption, still imposes

substantial burdens on the country’s environment. There is also overreliance on administrative measures to reduce pollution and conserve energy. Lack of coordination and cooperation across line ministries and across regional and local governments likewise remains a significant barrier even though partial progress has been made.

Environmental Situation in the People’s Republic of China Remains Critical

Notwithstanding the environmental achievements during the 11th Five-Year Plan period, the situation in the PRC remains critical, with the following key issues being particularly noteworthy:

- **Water pollution and water availability** continue to be critical problems. While the government has made major advances in the control of industrial and domestic point sources of water pollution, there is a growing challenge from nonpoint pollution from fertilizer runoff, pesticides, and discharges from intensive animal production facilities. Agricultural nonpoint sources affect the ability of lakes, rivers, streams, and estuaries to support aquatic life. Water availability also represents a major development challenge, with some estimates showing that, by 2030, demand could exceed supply by as much as 200 billion cubic meters (about one-third of total 2008 demand), unless major capital investments to strengthen water supplies are made beyond those presently planned. The government has already responded to this through the issuance of Central Document No. 1 of 2011 by the State Council, requiring governments at all levels to invest 10% of revenues from property transfers into water conservancy projects. But much remains to be done.
- **Air quality.** Fewer than 1% of the 500 largest cities in the PRC meet the air quality standards recommended by the World Health Organization, and 7 of these cities are ranked among the 10 most

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polluted cities in the world. There is now growing recognition that air pollution from adjacent urban or industrial areas in some parts of the PRC interacted and mixed to form regional and subregional patches of polluted air. Although industrial emissions have stabilized or been reduced in the past few years, a rapid increase in private car ownership is creating a new threat in the form of vehicle emissions.

- **Solid waste management** is becoming a top priority in the PRC. The country currently produces about 25% of the world's solid waste. Major investments in the development of facilities for the safe disposal of municipal solid waste were made during the 11th Five-Year Plan period, but these have not kept up with supply. Industrial solid waste management is an even bigger challenge.

Other environmental challenges facing the PRC include the increasing frequency of natural disasters and pollution accidents, land degradation, reduced biodiversity, and inadequate forest resources, among others.

Recommendations for the 12th Five-Year Plan on Environmental Protection

“Inclusive growth” is the government’s guiding principle in the 12th Five-Year Plan. The key themes of the plan are rebalancing the economy, ameliorating social inequality, and protecting the environment. Some of the important elements under these themes are

- reaching a national GDP growth rate target of 7%,
- promoting consumption over investments and exports,
- closing the rural–urban income gap, and

- achieving some ambitious energy efficiency and emission reduction targets.

To support these themes and their beneficial effects on long-term environmental protection, the 12th Five-Year Plan on environmental protection should consider the following measures, which include addressing macro-level factors that can directly affect the plan’s success:

Changing the Price of Resources and Removing Disincentives

- **Restructuring economic and fiscal systems to reflect environmental externality.** Economic growth should be redirected from its overdependence on manufacturing for exports toward the services sector, which depends on domestic demand. Essential to this shift is price reform of resources such as water, land, energy, mineral and extractive resources (particularly coal), and capital to reflect such factors as scarcity and environmental externalities associated with resource consumption.

Pollution charges should be raised to levels above the marginal costs of pollution control, and taxation and pricing measures should be implemented, to encourage companies to adopt pollution control measures and to deter heavy resource consumption and environmental pollution. Levies could be charged on chemical and petrochemical products to set up a super fund to clean up chemically contaminated soils. A renewable energy surcharge could be levied on thermal power and placed in a super fund to subsidize the development of renewable energy supply.

To remove disincentives and growth patterns that undermine environmental sustainability, fiscal reform should accompany economic restructuring. Since the fiscal reforms of the mid-1990s, subnational, particularly subprovincial, governments have been

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caught in an ever-tightening squeeze between the cost of implementing their health, education, welfare, and environmental obligations and the very limited revenue sources available to them. They are increasingly reliant on revenues from property development and loans contracted through “investment vehicles” that were established to bypass restrictions on their ability to issue bonds. In terms of environmental investments, this tends to focus attention of local governments on investments that will produce short- to medium-term revenues rather than on investments that are needed to solve the environmental problems at hand but may not generate revenue. Some experiments are already being undertaken (e.g., in Shanghai and Chongqing) to assess the feasibility of introducing property taxes. These experiments need to be expedited and expanded.

- **Adopting a more programmatic approach to environmental investment and enhancing investment efficiency.** Much of the PRC’s environmental investment is made through special campaigns that are often hastily conceived and implemented to respond to environmental incidents or emergencies. This approach is inefficient, too “top-down,” and extremely unpredictable in the medium to long term. A more programmatic approach to environmental investment is needed, with
 - (i) timetables that spread across 5-year planning periods,
 - (ii) increased flexibility for subnational governments to adapt programs to suit local conditions, and
 - (iii) higher levels of grant financing for investments with significant externalities.

While a substantial amount of money has been invested in protecting the environment, the effectiveness and efficiency of the investments

remain largely unknown. To improve the efficiency of public resources, more solid analyses on the cost-effectiveness and/or costs and benefits of the investment should be conducted ex ante as well as ex post. Policy making regarding future environmental investments should increasingly be based on the accumulated knowledge of the cost-effectiveness and/or costs and benefits of the available alternatives.

- **Focusing on quality of urban development.** With continued urbanization fast becoming a pillar of future economic development, significant improvements are needed in the planning and management of urban development. At present, a “wild west” quality to urban development is prevalent, which has much to do with the administrative hierarchy and the incentive systems that govern the behavior of local government officials. These incentive systems create a “rush to growth,” regardless of whether the economics are favorable, and a proliferation of urban infrastructure that may not always be needed. Thus, too much attention is being paid to the quantity, instead of the quality, of urban development. The government needs to
 - (i) sustain and extend its financial commitment to the development of essential urban environmental infrastructure,
 - (ii) look seriously at the incentive structure governing the work of municipal governments to improve its efficiency, and
 - (iii) provide much better guidance and rewards for the implementation of environmentally sustainable urban development, which makes efficient use of scarce land and other natural resources and maximizes the application of reduce–reuse–recycle strategies.

Expanded Use of Market-Based Instruments to Control Pollution

Overreliance on administrative measures has resulted in many problems, not the least being fraudulent reporting. In addition, coercive closure of enterprises to meet arbitrary targets may infringe on the rights and interests of enterprises and leave a trail of social side effects and grievances. More reliance needs to be placed on market-based instruments.

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- **Introducing water quality trading early to reduce the nonpoint source pollution.** The emerging great pollution control challenge is nonpoint source pollution. It is very important to introduce market-based mechanisms as an adjunct to the command-and-control approach to nonpoint source pollution control. The majority of nutrient pollution originates from nonpoint sources, principally agricultural sources. Water quality trading programs that allow point-to-nonpoint trades may become mechanisms for leveraging point-source regulatory requirements to generate reductions from unregulated nonpoint sources. More than 70% of active water quality trading programs in the world allow trades between point and nonpoint sources. ADB has recently supported MEP in designing water quality trading programs in Tai Lake and Chao Lake. These experiments need to be expedited and replicated in other areas.
- **Developing environmental service markets that attract the private sector.** The government, in particular through the work of MEP and the National Development and Reform Commission, is advocating the application of eco-compensation principles to solve certain intractable environmental problems such as catchment protection, rehabilitation of degraded watershed, and other dimensions of natural resources conservation. However, an overly large public sector presence as buyer of environmental services risks crowding out the private sector. In developing a national eco-compensation policy framework, the government needs to (i) think carefully about how its role can evolve from being the main buyer of environmental services to more of an “enabler” that encourages private sector participation, and (ii) establish regulatory requirements that can create markets (such as having to offset the impacts of projects on biodiversity or watershed services).

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Legal Reform to Clarify Responsibilities and Trigger Cooperation

The Environmental Protection Law (EPL) needs to be revised to make it up-to-date and relevant to the 21st century. The legal reform should address two fundamental issues: (i) rights and authorities over environmental protection, and (ii) coordination between jurisdictions and institutions.

- **Clarifying rights and authorities would improve environmental governance.** The government should clarify and strengthen the EPL regarding rights and responsibilities over environmental protection work, which would include designating responsibility for ensuring environmental quality. Rights and authorities determine the key actors and stakeholders of environmental protection work and will provide the foundation for successful environmental governance. Revisions are required to
 - establish that MEP is the sole “competent department” tasked with the unified supervision and management of the environmental protection work of the entire nation, and that the environmental work of other departments must be consistent with and approved by MEP;
 - confirm that, in the event of conflicts with other laws, the provisions of the EPL prevail; and
 - create unambiguous authority for inspectors from MEP and its subnational counterparts to enter and inspect enterprises and other locations that are, or are believed to be, sources of pollution.
- **Legal reform would trigger coordination between jurisdictions.** Provinces, municipalities, and counties, while competing with each other on economic growth, often “race to the bottom”⁶ in environmental

⁶ The phrase “race to the bottom” is a socioeconomic concept that occurs between nations or within a nation (such as between states or counties). When competition becomes fierce between nations (or levels of government) over a particular area of trade and production, there is an increased incentive to dismantle or eliminate currently existing regulatory standards, such as environmental safeguards.

surveillance. The problem is further aggravated by the fact that ecological boundaries are rarely matched with political boundaries, which encourages local governments to “leave the problem to the neighbors.” Given the range of central and provincial government ministries and departments with different and sometimes overlapping responsibilities for environmental protection, the EPL amendment should develop frameworks for cross-provincial coordination and cooperation.

Conclusion

The prospects for the environmental agenda under the 12th Five-Year Plan and beyond to 2020 will depend substantially on the progress in restructuring the economy, particularly the balance between the secondary and tertiary sectors and the role of large-scale, capital-intensive industries. Despite the environmental achievements made in the 11th Five-Year Plan, the mode of economic growth, which relies more on manufacturing than on services and more on investment than on consumption, still imposes substantial burdens on the country’s environment.

The fundamental changes of the current mode of growth will depend on how quickly the government can overcome the considerable momentum behind the growth,

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which includes the local “rush to growth” approach to urbanization, the dominance of coal in the energy structure, and the overdependence on administrative measures to manage the environment.

Against this backdrop, this brief recommends that the PRC government consider the following in its 12th Five-Year Plan on Environmental Protection:

- (i) changing the price of resources and removing disincentives,
- (ii) expanding the use of market-based instruments to control pollution, and
- (iii) developing legal reform to clarify responsibilities and trigger cooperation.

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