People’s Republic of China: Improving the Design of the National Carbon Emissions Trading System
CURRENCY EQUIVALENTS
(as of 1 August 2018)

Currency unit – yuan (CNY)
CNY1.00 = $0.1468
$1.00 = CNY6.8112

ABBREVIATIONS

ADB – Asian Development Bank
ETS – emissions trading system
EU ETS – European Union Emissions Trading System
GHG – greenhouse gas
NDRC – National Development and Reform Commission
PRC – People’s Republic of China
RGGI – Regional Greenhouse Gas Initiative
TA – technical assistance
UNFCCC – United Nations Framework Convention on Climate Change

NOTE

In this report, “$” refers to United States dollars.

Vice-President
Director General
Director

Amy S.P. Leung, East Asia Department (EARD)
Sujata Gupta, Officer-in-Charge, Transport and Communications Division, EARD

Team leader
Team members

Xuedu Lu, Lead Climate Change Specialist, EARD
Arlene Ayson, Operations Assistant, EARD
Czareana Dello, Senior Project Assistant, EARD
Virender Duggal, Principal Climate Change Specialist (Future Carbon Fund), Sustainable Development and Climate Change Department
Gloria Gerilla-Teknomo, Senior Transport Sector Officer, EARD
Na Won Kim, Senior Environment Specialist, EARD

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.
# CONTENTS

## KNOWLEDGE AND SUPPORT TECHNICAL ASSISTANCE AT A GLANCE

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>II. ISSUES</td>
<td>1</td>
</tr>
<tr>
<td>III. THE TECHNICAL ASSISTANCE</td>
<td>3</td>
</tr>
<tr>
<td>A. Impact and Outcome</td>
<td>3</td>
</tr>
<tr>
<td>B. Outputs, Methods, and Activities</td>
<td>3</td>
</tr>
<tr>
<td>C. Cost and Financing</td>
<td>4</td>
</tr>
<tr>
<td>D. Implementation Arrangements</td>
<td>4</td>
</tr>
<tr>
<td>IV. THE PRESIDENT’S DECISION</td>
<td>5</td>
</tr>
</tbody>
</table>

## APPENDIXES

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Design and Monitoring Framework</td>
<td>6</td>
</tr>
<tr>
<td>2. Cost Estimates and Financing Plan</td>
<td>8</td>
</tr>
<tr>
<td>3. List of Linked Documents</td>
<td>9</td>
</tr>
</tbody>
</table>
## KNOWLEDGE AND SUPPORT TECHNICAL ASSISTANCE AT A GLANCE

### 1. Basic Data

<table>
<thead>
<tr>
<th>Project Number: 52015-001</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Name:</strong> Improving the Design of the National Carbon Emissions Trading System</td>
</tr>
<tr>
<td><strong>Department/Division:</strong> EARD/EATC</td>
</tr>
<tr>
<td><strong>Nature of Activity:</strong> Policy Advice</td>
</tr>
<tr>
<td><strong>Executing Agency:</strong> Ministry of Ecology and Environment former &quot;Ministry of Environmental Protection&quot;</td>
</tr>
<tr>
<td><strong>Modality:</strong> Regular</td>
</tr>
<tr>
<td><strong>Country:</strong> China, People's Republic of</td>
</tr>
</tbody>
</table>

### 2. Sector

| **Subsector(s):** Public sector management |
| **ADB Financing ($ million):** 0.75 |

**Total:** 0.75

### 3. Strategic Agenda

| **Subcomponents:** Public administration |
| **Climate Change Information:** Climate Change impact on the Project (Low) |

### 4. Drivers of Change

| **Components:** Institutional development, Organizational development, Knowledge sharing activities, Regional organizations |
| **Gender Equity and Mainstreaming:** No gender elements (NGE) |

### 5. Poverty and SDG Targeting

| **Location Impact:** Nation-wide (High) |

### 6. Risk Categorization

| **Risk Level:** Low |

### 7. Safeguard Categorization

| **Safeguard Policy Statement does not apply** |

### 8. Financing

| **Modality and Sources:** ADB |
| **Amount ($ million):** 0.75 |
| **ADB:** Knowledge and Support technical assistance: Climate Change Fund (0.75) |
| **Cofinancing:** 0.00 |
| **Counterpart:** 0.00 |
| **Total:** 0.75 |
I. INTRODUCTION

1. The Government of the People’s Republic of China (PRC) requested technical assistance (TA) from the Asian Development Bank (ADB) to support improvements to the design of its national carbon emissions trading system (ETS). Together with other policies, the national ETS is expected to operate as a cost-effective market mechanism to support the achievement of the PRC’s climate change mitigation targets. The TA is included in ADB’s country operations business plan, 2018–2020 for the PRC.¹

2. The knowledge and support TA will aid the PRC’s Ministry of Ecology and Environment in formulating responsive carbon pricing measures and prudent market oversight measures, which will help the national ETS function effectively and efficiently.² The TA will develop three policy recommendations for consideration by the government on (i) auctioning of greenhouse gas (GHG) emission allowance;³ (ii) GHG emission credit management, such as banking; and (iii) ETS market risk identification and management.

II. ISSUES

3. On 30 June 2015, the government submitted its intended nationally determined contribution to the United Nations Framework Convention on Climate Change (UNFCCC), promising to achieve peak carbon dioxide emissions by 2030 or sooner and to lower carbon dioxide emissions per unit of gross domestic product by 60%–65% from 2005 levels.⁴ The PRC estimates that the country will hit peak emissions when its per capita gross domestic product is about 33% lower than the average of countries in the Organisation for Economic Co-operation and Development; its per capita emission level is forecast to be about 30% smaller than the average of those countries.⁵ An effective ETS to help reduce GHG mitigation costs and provide incentives to balance economic growth and climate change mitigation cost-effectively will be crucial for the PRC to meet its commitment. In all jurisdictions where an ETS has been implemented, ETS policies and measures such as carbon pricing and market oversight measures are at the core of ETS governance to ensure a safe and efficient trading environment, enhance market confidence, and reduce the overall cost of meeting ETS mitigation targets.

4. The PRC began testing ETSs through pilot programs in the municipalities of Beijing, Chongqing, Shanghai, Shenzhen and Tianjin; and in the provinces of Guangdong and Hubei in October 2011.⁶ ADB approved three TA projects to support ETS development in the PRC during the ETS pilot period, focusing on the basic design of an ETS at a pilot city or province.⁷ The first

² The PRC’s National Development and Reform Commission (NDRC) proposed the TA. In March 2018, the first session of the 13th National People’s Congress of the People’s Republic of China decided to shift climate change management from the NDRC to the new Ministry of Ecology and Environment.
³ In an ETS, the government imposes a limit on the total emissions in one or more sectors of the economy. Companies in these sectors need to hold one allowance (or permit) for every ton of GHG emissions they release. There are two approaches to allocating permits: free allocation (based on past emissions or performance standards) or sold at an auction at a competitive public price.
⁴ United Nations Framework Convention on Climate Change. 2015. Enhanced Actions on Climate Change: China’s Intended Nationally Determined Contribution. ADB recognizes the People’s Republic of China as the official ADB member name.
⁵ World Bank. 2016. Pursuing an Innovative Development Pathway: Understanding China’s NDC.
TA supported Beijing in enhancing the capacity of the Beijing Environment Exchange by developing a road map for the establishment of a carbon finance center. The second TA supported Tianjin in developing a trading system, including trading rules and regulations, trading platform installation, and ETS registry setting. The third TA supported Shanghai in developing trading products and methods of sector benchmarks in GHG emission allocation. All pilot ETSs developed and implemented ETS rules and policies that covered aspects such as offsetting rules and market adjustment. For example, the Beijing pilot ETS issued rules on the use of emission-reduction credits to offset part of the emissions of the covered entities and on open market operations to ensure market stability and avoid price fluctuations. However, the pilot ETS rules and policies have been ineffective because many factors affecting ETS operations were not addressed appropriately. One example is the unscheduled revision to the offsetting rules and allowance banking rules in the Shanghai pilot ETS in response to the abundant use of offsetting credits and rapid plummeting of the allowance price.

5. The European Union Emissions Trading System (EU ETS), which has been operating since 2005, initially experienced stolen credits and high price volatility, which led the European Union to strengthen ETS market oversight by (i) applying rules governing financial markets to all segments of the ETS, (ii) establishing the market stability reserve, and (iii) limiting the use of emission-reduction credits generated from clean development mechanism projects. All other ETSs, including the Regional Greenhouse Gas Initiative (RGGI), the New Zealand ETS, and the California ETS, experienced an oversupply of GHG emission allowances and thus lower carbon trading prices, which made them reform and improve their ETS oversight system by introducing and refining the policies and measures to manage the supply of allowances and adjust market prices based on market conditions. These policies and measures helped avoid an oversupply of allowances and prevent price increases, thus keeping carbon prices at reasonable levels. For example, the RGGI adopted a flexibility reserve similar to the EU ETS in order to adjust the supply and its impact on carbon prices. Floor and cap prices are commonly used to manage carbon prices in the California, Québec, and RGGI systems. These experiences and lessons can be useful references for the PRC in developing its ETS policies and measures.

6. On 19 December 2017, the National Development and Reform Commission launched the PRC’s national ETS through the Development Plan for National Carbon Emission Trading Market (Power Generation Sector) that was endorsed by the State Council, which laid out the national ETS development and operation plan. Based on the development plan, Local governments following the guidance of the Ministry of Ecology and Environment are expected to assign GHG emission permits to power generation entities covered by the ETS in 2018, and trial permit trading will start in 2019. The national ETS will operate normally by 2020 and will gradually expand to reach other sectors.

---


7. The PRC’s national ETS is expected to be the biggest carbon market in the world with an annual emission volume exceeding 3 billion metric tons, dwarfing the EU ETS volume of about 1.8 billion metric tons in 2016. This will make the PRC’s national ETS one of the most influential in the world, and its effective operation will be vital to the success of global climate change campaign. Given the short history and complexity of the ETS, the government is careful in the national system design. The development plan stated that effective and strict oversight mechanisms involving all relevant authorities should be established. To support ETS operations, the government needs to formulate effective and efficient policies and measures in market oversight and market price management to address market volatility and any unintended adverse impacts such as market manipulation and other market misconduct. However, the development plan is only a framework, and ETS operational policies and measures—such as GHG emission allowance auctions, trading credit banking, and ETS market risk management—have not been developed yet.

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

8. The TA is aligned with the following impact: the PRC’s national ETS functioning and operational. The TA will have the following outcome: national ETS policies on allowance management and market oversight improved.

B. Outputs, Methods, and Activities

9. The PRC’s national ETS is more complex than the local pilot ETSs. The PRC needs to develop customized policies and measures to support the effective and efficient operations of the national ETS. The TA will provide vital inputs for developing policies, measures, and guidelines to strengthen the national ETS operation based on (i) the experience and lessons learned from the pilot ETSs, including the findings from the three ADB-assisted TA projects; and (ii) the lessons learned by other carbon markets, such as the EU ETS, the RGGI, the Québec–California–Ontario Carbon Market, and the New Zealand ETS. It also takes into account the special circumstances facing the PRC’s national ETS. The TA will deliver the following outputs:

(i) **Output 1: Policy recommendations on allowance management and market oversight measures of the national emissions trading system developed.**

   Based on the analysis of the factors influencing carbon market operations in the PRC and the experiences and lessons learned by the PRC pilot ETSs and the carbon markets in other countries, the TA team will draft policy recommendations on allowance management and market oversight measures of the PRC’s national ETS. This output will have three parts:

   (a) **Policy recommendation on allowance auction developed.** The TA team will develop a recommendation based on a review and assessment of available experience and lessons of allowance auction practices, and a study on the relationship between allowance prices and marginal abatement costs. The recommendation will include an implementation plan and a manual of management processes and procedures to help...
implement the plan. It will also cover institutional and governance arrangements and how parties would carry out their responsibilities.

(b) **Policy recommendation on managing allowance and offsetting credits developed.** The TA team will develop a policy recommendation based on research and analysis of different existing regulations related to the allowance and offsetting credit validity period, different banking lengths, the impact on market practitioners’ trading behavior, and market risks.\(^{15}\)

(c) **Recommendation on market oversight measures of the national emissions trading system operation developed.** The recommendation will cover the objectives, scope, principles, roles and responsibilities, and general requirements of market oversight to manage the ETS operation system effectively (including GHG emission monitoring, reporting, and verification) and to minimize the impacts of potential market risks. It is expected to help in the early identification and assessment of market risks. Coordinating relevant policies, such as Energy Savings Trade and Green Electricity Certificate Trading, is needed for the national ETS to be effective. Hence, the recommendation will also address the impact of the policies of different agencies that may affect the ETS’s effective operations. Finally, this output will recommend the applicable state-of-art technologies including blockchain technology as a pilot innovative measure of ETS market oversight, for the consideration by the government.

(ii) **Output 2: National capacity in emissions trading system management enhanced.** The TA will support the executing agency in organizing two training workshops for local government officials and experts in ETS operational management. The training workshops will introduce the findings of this TA, international best practice in ETS, updated UNFCCC decisions on carbon markets, and national ETS policies and measures.

C. **Cost and Financing**

10. The TA is estimated to cost $900,000, of which $750,000 will be financed on a grant basis by the Climate Change Fund.\(^{16}\) The key expenditure items are in Appendix 2.

11. The government will provide counterpart support in the form of staff time, office space and supplies, and other in-kind contributions.

D. **Implementation Arrangements**

12. The Transport and Communications Division of ADB’s East Asia Department will select, supervise, and evaluate consultants; organize training programs, seminars, workshops, and/or forums; and administer all other business of the TA. It will work closely with the Department of Climate Change of the PRC’s Ministry of Ecology and Environment, the executing agency of this TA. The implementation arrangement is summarized in the table.

---

\(^{15}\) Compliance flexibility can be enhanced by the option of saving credits/allowances to future periods (banking). This option enhances cost-effectiveness and foster carbon price stability. In addition, banking provides incentives for early action, but also involves increasing risks of over-allocation of allowances/credits in subsequent periods.

\(^{16}\) Established by ADB.
Implementation Arrangements

<table>
<thead>
<tr>
<th>Aspects</th>
<th>Arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicative implementation period</td>
<td>October 2018–September 2020</td>
</tr>
<tr>
<td>Executing agency</td>
<td>Department of Climate Change, Ministry of Ecology and Environment, People’s Republic of China</td>
</tr>
<tr>
<td>Consultants</td>
<td>To be selected and engaged by ADB</td>
</tr>
<tr>
<td>Individual selection</td>
<td>International expertise</td>
</tr>
<tr>
<td></td>
<td>(12 person-months)</td>
</tr>
<tr>
<td></td>
<td>$240,000</td>
</tr>
<tr>
<td>Individual selection</td>
<td>National expertise</td>
</tr>
<tr>
<td></td>
<td>(44 person-months)</td>
</tr>
<tr>
<td></td>
<td>$220,000</td>
</tr>
<tr>
<td>Disbursement</td>
<td>The technical assistance resources will be disbursed following ADB's Technical Assistance Disbursement Handbook (2010, as amended from time to time).</td>
</tr>
</tbody>
</table>

ADB = Asian Development Bank.
Source: Asian Development Bank estimates.

13. **Consulting services.** The TA will need 56 person-months of consulting services from (i) a senior international carbon market specialist as team leader and carbon market specialist (12 person-months); and (ii) a senior national carbon market specialist as deputy team leader, a carbon market specialist for allowance auction, a carbon market specialist for credit validity, a carbon market specialist for market oversight, a securities market specialist, and a project coordinator (44 person-months). ADB will engage the consultants through individual selection to secure the best international and national experts in different aspects of ETS development, following the ADB Procurement Policy (2017, as amended from time to time) and its associated project administration instructions and/or staff instructions.18

14. ADB will implement the TA from 1 October 2018 to 30 September 2020. The consultants will need to submit timely TA deliverables, which are included in the terms of reference for consultants (footnote 18).

**IV. THE PRESIDENT’S DECISION**

15. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of $750,000 on a grant basis to the Government of the People’s Republic of China for Improving the Design of the National Carbon Emissions Trading System, and hereby reports this action to the Board.

---

17 ADB will consider output-based contracts for consulting services.
18 Terms of Reference for Consultants (accessible from the list of linked documents in Appendix 3).
# DESIGN AND MONITORING FRAMEWORK

## Impact the TA isAligned with
The PRC’s national ETS functioning and operational

<table>
<thead>
<tr>
<th>Results Chain</th>
<th>Performance Indicators with Targets and Baselines</th>
<th>Data Sources and Reporting Mechanisms</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome</td>
<td>By 2021: Three policies or measures on allowance management and market oversight of the national ETS issued by the MEE (2018 baseline: 0)</td>
<td>China’s Policies and Actions for Addressing Climate Change, 2021–2024</td>
<td>Possible shift in priorities of the government agencies may affect the adoption of policies and measures of the national ETS</td>
</tr>
</tbody>
</table>
| Outputs       | By 2020: 1a. Policy recommendation on allowance auction submitted to the MEE (2018 baseline: policy not drafted)  
1b. Policy recommendation on managing allowances and offsetting credits submitted to the MEE (2018 baseline: policy not drafted)  
1c. Policy recommendation on market oversight of the national ETS operation submitted to the MEE (2018 baseline: policy not drafted) | 1a–1c. MEE reports\(b\) | First-hand knowledge and lessons learned from operational ETSs may not be available to the TA team |
|               | 2. 100 local government officials and experts trained and report skills improved on ETS operational management (2018 baseline: 0) | 2. Feedback survey after training events | Recommendations and/or lessons from other jurisdictions may not work because of the special circumstance of the national ETS |

## Key Activities with Milestones
1. **Policy recommendations on allowance management and market oversight measures of the national ETS developed**
   1.1 Policy recommendation on allowance auction developed
   1.1.1 Collect and analyze national ETS feature data and documents related to the allowance auction policy design (November 2018–February 2019)
   1.1.2 Collect and analyze the allowance auction policy designs of other ETSs (November 2018–February 2019)
   1.1.3 Develop a draft policy recommendation on allowances auction (March–June 2019)
   1.1.4 Conduct consultations to improve the recommendation (July–December 2019)
1.1.5 Circulate the draft policy recommendation to the MEE; other line ministries (CMA, CSRC, MOF, MOST, NDRC, and NEA); and experts for review and comments (January–March 2020)

1.2 Policy recommendation on managing allowance and offsetting credits developed
1.2.1 Collect and analyze national ETS feature data and documents related to managing allowance and offsetting credits (November 2018–February 2019)
1.2.2 Collect and analyze the allowance and offsetting credit management policy designs of other ETSs (November 2018–February 2019)
1.2.3 Develop a draft policy recommendation on managing allowance and offsetting credits (March–June 2019)
1.2.4 Conduct consultations to improve the recommendation (July–December 2019)
1.2.5 Circulate the draft policy recommendation to the MEE; other line ministries (CMA, CSRC, MOF, MOST, NDRC, and NEA); and experts for review and comments (January–March 2020)

1.3 Policy recommendation on market oversight of the national ETS operation developed
1.3.1 Collect and analyze national ETS feature data and documents related to the market oversight policy of the national ETS operation (November 2018–February 2019)
1.3.2 Collect and analyze the market oversight policy designs of other ETSs (November 2018–February 2019)
1.3.3 Develop a draft policy recommendation on market oversight of the national ETS operation (March–June 2019)
1.3.4 Conduct consultations to improve the recommendation (July–December 2019)
1.3.5 Circulate the draft policy recommendation to the MEE; other line ministries (CMA, CSRC, MOF, MOST, NDRC, and NEA); and experts for review and comments (January–March 2020)

2. National capacity in ETS management enhanced
2.1 Prepare materials for training local government officials and experts (August 2019–December 2019)
2.2 Organize the first training workshop in April 2020 (January 2020–April 2020)
2.3 Organize the second training workshop in July 2020 (May 2020–July 2020)

TA Management Activities
Mobilize a team of consultants by October 2018
Prepare draft inception report with detailed work plan and conduct inception workshop by January 2019
Prepare interim report and conduct interim workshop by December 2019
Conduct international training for the MEE in 2019 and by August 2020
Prepare draft final policy recommendations and conduct in-depth workshop by April 2020
Conduct workshop for training local government officers and experts in April and July 2020
Revise draft final policy recommendations and conduct policy dialogue and final workshop by July 2020
Prepare draft policy study publication based on all policy recommendations by July 2020
Submit draft policy recommendations to the government by August 2020

Inputs
Climate Change Fund: $750,000
Note: The government will provide counterpart support in the form of staff time, office space and supplies, and other in-kind contributions.

Assumptions for Partner Financing
Not applicable


b The official documents reporting the TA outputs can be found at the MEE website (Government of the PRC, MEE. http://www.mep.gov.cn).

### COST ESTIMATES AND FINANCING PLAN
($'000)

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Climate Change Fund</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>1. Consultants</td>
<td></td>
</tr>
<tr>
<td>a. Remuneration and per diem</td>
<td></td>
</tr>
<tr>
<td>i. International consultants</td>
<td>240.0</td>
</tr>
<tr>
<td>ii. (National consultants)</td>
<td>220.0</td>
</tr>
<tr>
<td>b. Out-of-pocket expenditures</td>
<td></td>
</tr>
<tr>
<td>i. International and local travel</td>
<td>50.0</td>
</tr>
<tr>
<td>2. Printed external publications&lt;sup&gt;b&lt;/sup&gt;</td>
<td>10.0</td>
</tr>
<tr>
<td>3. Training, seminars, workshops, forum, and conferences&lt;sup&gt;c&lt;/sup&gt;</td>
<td>180.0</td>
</tr>
<tr>
<td>4. Contingencies</td>
<td>50.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>750.0</strong></td>
</tr>
</tbody>
</table>

Note: The technical assistance is estimated to cost $900,000, of which contributions from the Asian Development Bank (ADB) are presented in the table above. The government will provide counterpart support in the form of staff time, office space and supplies, and other in-kind contributions. The value of government contribution is estimated to account for 17% of the total technical assistance cost.

<sup>a</sup> Established by ADB.

<sup>b</sup> Includes translation costs.

<sup>c</sup> Includes the travel costs of ADB staff acting as resource persons, interpretation, and translation costs.

Source: Asian Development Bank estimates.
LIST OF LINKED DOCUMENTS
http://www.adb.org/Documents/LinkedDocs/?id=52015-001-TAResport

1. Terms of Reference for Consultants