

Document of  
The World Bank

FOR OFFICIAL USE ONLY

Report No: 74143-CN

RESTRUCTURING PAPER

ON A

PROPOSED RESTRUCTURING  
FOR A  
CHINA THERMAL POWER EFFICIENCY PROJECT

GLOBAL ENVIRONMENTAL FACILITY (GEF) TF094204-CN  
APPROVED ON MAY 5, 2009

TO THE

PEOPLE'S REPUBLIC OF CHINA

December 25, 2012

China and Mongolia Sustainable Development Unit  
Sustainable Development Department  
East Asia and Pacific Region

This document has a restricted distribution and may be used by recipients only in the performance of their official duties. Its contents may not otherwise be disclosed without World Bank authorization.

## ABBREVIATIONS AND ACRONYMS

BJ	Beijiao Power Plant
CHP	Combined Heat and Power
CO <sub>2</sub>	Carbon Dioxide
EIRR	Economic Internal Rate of Return
EMP	Environmental Management Plan
EPB	Environmental Protection Bureau
FIRR	Financial Internal Rate of Return
GD	Guangdong Province
GDGP	Guangdong Grid Power Company
GEF	Global Environmental Facility
GoC	Government of China
HT	Huangtai Power Plant
IA	Implementing Agency
ISR	Implementation Status Report
MCSU	Mechanism for the Closure of Small Units
NDRC	National Development and Reform Commission
NO <sub>x</sub>	Nitrogen Oxide
OP/BP	Operation Procedure/Bank Policy
PEO	Project Executive Office
PM <sub>10</sub>	Particles Matter with diameters of 10 micrometers or less
PMO	Project Management Office
SD	Shandong Province
SO <sub>x</sub>	Sulfur Oxide
SX	Shanxi Province
TY	Taiyuan No. 1 Power Plant
VSD	Variable Speed Drive
WH	Weihai Botong Power Plant
WX	Wuxiang Power Plant
YG	Yangguang Power Plant

Regional Vice President:	Ms. Pamela Cox, EAPVP
Country Director:	Mr. Klaus Rohland, EACCF
Sector Director / Manager:	Mr. John Roome, EASSD/ Mr. Mark R. Lundell, EASCS
Task Team Leader:	Mr. Ximing Peng, EASCS

<b>Restructuring</b>	<b>Status: Draft</b>
<b>Restructuring Type: Level I</b>	
Last modified on date :	

<b>1. Basic Information</b>	
Project ID & Name	P098654 – GEF China Thermal Power Efficiency Project
Country	China
Task Team Leader	Ximing Peng
Sector Manager/Director	Mark R. Lundell / John Roome
Country Director	Klaus Rohland
Original Board Approval Date	May 5, 2009
Current Closing Date	December 31, 2013
Proposed Closing Date [if applicable]	
EA Category	B
Revised EA Category	No Change
EA Completion Date	November 30, 2008
Revised EA Completion Date	November 15, 2011

<b>2. Revised Financing Plan (US\$m)</b>		
<b>Source</b>	<b>Original</b>	<b>Revised</b>
Recipient	15.50	10.30
Global Environment Facility (GEF)	19.70	19.70
Sub-borrowers(s)/Implementing Agencies	73.76	53.15
<b>Total</b>	<b>108.96</b>	<b>83.15</b>

<b>3. Recipient</b>		
<b>Organization</b>	<b>Department</b>	<b>Location</b>
Ministry of Finance	International Department	Beijing, China

<b>4. Implementing Agency</b>		
<b>Organization</b>	<b>Department</b>	<b>Location</b>
Ministry of Finance/National Energy Administration/State Electricity Regulatory Commission	National Project Management Office	Beijing, China
Shanxi Provincial Government	Provincial Financial Bureau	Taiyuan, Shanxi, China
Shandong Provincial Government	Provincial Financial Bureau	Jinan, Shandong, China
Guangdong Power Grid Corporation	Dispatch Center	Guangzhou, Guangdong, China

<b>5. Disbursement Estimates (US\$m)</b>		
<b>Actual amount disbursed as of 09/30/2012</b>		<b>10.29</b>
<b>Fiscal Year</b>	<b>Annual</b>	<b>Cumulative</b>
		10.29
2013	6.78	17.07
2014	2.63	19.70
	<b>Total</b>	<b>19.70</b>

<b>6. Policy Exceptions and Safeguard Policies</b>																																		
<b>Does the restructured project require any exceptions to Bank policies?</b>	N																																	
Have these been approved by Bank management																																		
Is approval for any policy exception sought from the Board?																																		
<b>Does the scale-up of restructured projects trigger any new safeguard policies? If yes, please select from the checklist below.</b>	Y																																	
<table border="1"> <thead> <tr> <th><b>Safeguard Policies Triggered</b></th> <th><b>Last Status</b></th> <th><b>Proposed</b></th> </tr> </thead> <tbody> <tr> <td>Environmental Assessment (OD 4.01)</td> <td><input checked="" type="checkbox"/> &lt;&gt;</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Natural Habitats (OP 4.04)</td> <td><input type="checkbox"/> &lt;&gt;</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Forestry (OP 4.36)</td> <td><input type="checkbox"/> &lt;&gt;</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Pest Management (OP 4.09)</td> <td><input type="checkbox"/> &lt;&gt;</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Physical Cultural Resources (OP 4.11)</td> <td><input type="checkbox"/> &lt;&gt;</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Indigenous Peoples (OD 4.20)</td> <td><input type="checkbox"/> &lt;&gt;</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Involuntary Resettlement (OP 4.12)</td> <td><input checked="" type="checkbox"/> &lt;&gt;</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Safety of Dams (OP 4.37)</td> <td><input type="checkbox"/> &lt;&gt;</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Projects in International Waterways (OP 7.50)</td> <td><input type="checkbox"/> &lt;&gt;</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Projects in Disputed Areas (OP 7.60)</td> <td><input type="checkbox"/> &lt;&gt;</td> <td><input type="checkbox"/></td> </tr> </tbody> </table>	<b>Safeguard Policies Triggered</b>	<b>Last Status</b>	<b>Proposed</b>	Environmental Assessment (OD 4.01)	<input checked="" type="checkbox"/> <>	<input checked="" type="checkbox"/>	Natural Habitats (OP 4.04)	<input type="checkbox"/> <>	<input type="checkbox"/>	Forestry (OP 4.36)	<input type="checkbox"/> <>	<input type="checkbox"/>	Pest Management (OP 4.09)	<input type="checkbox"/> <>	<input type="checkbox"/>	Physical Cultural Resources (OP 4.11)	<input type="checkbox"/> <>	<input type="checkbox"/>	Indigenous Peoples (OD 4.20)	<input type="checkbox"/> <>	<input type="checkbox"/>	Involuntary Resettlement (OP 4.12)	<input checked="" type="checkbox"/> <>	<input checked="" type="checkbox"/>	Safety of Dams (OP 4.37)	<input type="checkbox"/> <>	<input checked="" type="checkbox"/>	Projects in International Waterways (OP 7.50)	<input type="checkbox"/> <>	<input type="checkbox"/>	Projects in Disputed Areas (OP 7.60)	<input type="checkbox"/> <>	<input type="checkbox"/>	
<b>Safeguard Policies Triggered</b>	<b>Last Status</b>	<b>Proposed</b>																																
Environmental Assessment (OD 4.01)	<input checked="" type="checkbox"/> <>	<input checked="" type="checkbox"/>																																
Natural Habitats (OP 4.04)	<input type="checkbox"/> <>	<input type="checkbox"/>																																
Forestry (OP 4.36)	<input type="checkbox"/> <>	<input type="checkbox"/>																																
Pest Management (OP 4.09)	<input type="checkbox"/> <>	<input type="checkbox"/>																																
Physical Cultural Resources (OP 4.11)	<input type="checkbox"/> <>	<input type="checkbox"/>																																
Indigenous Peoples (OD 4.20)	<input type="checkbox"/> <>	<input type="checkbox"/>																																
Involuntary Resettlement (OP 4.12)	<input checked="" type="checkbox"/> <>	<input checked="" type="checkbox"/>																																
Safety of Dams (OP 4.37)	<input type="checkbox"/> <>	<input checked="" type="checkbox"/>																																
Projects in International Waterways (OP 7.50)	<input type="checkbox"/> <>	<input type="checkbox"/>																																
Projects in Disputed Areas (OP 7.60)	<input type="checkbox"/> <>	<input type="checkbox"/>																																

<b>7a. Project Development Objectives/Outcomes</b>
<b>Original/Current Project Development Objectives/Outcomes</b>
The project development objective is to reduce coal consumption and GHG emissions per unit of electricity production in Shanxi, Shandong and Guangdong provinces in China, through (i) mitigating the financial impact of closing inefficient small-sized coal-fired units to achieve targeted closure on schedule; (ii) demonstrating the viability of investments in efficiency improvements in existing mid-sized thermal units; and (iii) developing effective regulations for supporting the pilot programs for transition to efficient generation dispatch.

<b>7b. Revised Project Development Objectives/Outcomes [if applicable]</b>
The PDO remains unchanged.

**CHINA**  
**THERMAL POWER EFFICIENCY**

**CONTENTS**

	Page
<b>A. SUMMARY .....</b>	<b>6</b>
<b>B. PROJECT STATUS.....</b>	<b>6</b>
<b>C. PROPOSED CHANGES .....</b>	<b>7</b>
<b>D. APPRAISAL SUMMARY.....</b>	<b>10</b>
<b>ANNEX 1: RESULTS FRAMEWORK AND MONITORING .....</b>	<b>13</b>
<b>ANNEX 2: REALLOCATION OF PROCEEDS.....</b>	<b>16</b>



## **THERMAL POWER EFFICIENCY RESTRUCTURING PAPER**

### **A. SUMMARY**

1. This paper seeks the approval of the Executive Directors to make the following changes to the China Thermal Power Efficiency Project (the Project): (1) trigger a new safeguard policy – Safety of Dams (OP/BP 4.37); (2) amend the intermediate output indicators; (3) adjust the project components; and (4) adjust the implementation arrangement to include new implementing agencies. The proposed adjustment of the project components include: (1) the scope of Part A of the Project is reduced due to cancellation of two activities (closure of small power plants and CHP online monitoring system in Shanxi province); and (2) the scope of Part B of the Project is expanded to include the rehabilitations of three additional power plants, including: Weihai power plant in Shandong province, Wuxiang Power Plant and Taiyuan No. 1 Power Plant in Shanxi province. As a result, part of the GEF grant is reallocated from Part A to Part B of the Project. The proposed changes are in response to the request of the Government of China (GoC) made through three letters from the Ministry of Finance dated November 3, 2011, February 7 and November 9, 2012<sup>1</sup>.

2. Prior to the request, the project closing date has been extended from December 31, 2012 to December 31, 2013 through a CD-approved level II restructuring. Further extension of project closing date is not requested in this restructuring.

### **B. PROJECT STATUS**

3. The objective of the Project is to reduce coal consumption and greenhouse gas emissions per unit of electricity production in Shanxi Province, Shandong Province, and Guangdong Province. The project restructuring does not result in any change in the project objective.

4. The project was approved by the Board on May 5, 2009, and the legal documents were signed on June 21, 2009. Project implementation was delayed at the early stage, and the disbursement of the GEF grant was less than 20% by the end of June 2011 after the project had been effective for more than one and half years. Progress has been made since June 2011, with the improvement of project management and enhanced project supervision: (a) total disbursement plus the pending expenditures to be reconciled reached about 70% by the end of September 2012; (b) an implementation plan was in place and agreed with the Bank team; and (c) the requests for project restructuring were submitted for the Bank's consideration. The rating of the project implementation was upgraded to moderately satisfactory in November 2012 and there are no outstanding issues from Financial Management perspective. Provided the project restructuring can be

---

<sup>1</sup> As the proposed changes of project scope involved two provinces and national government, the preparation status for each proposed change varied. These changes were confirmed by the Ministry of Finance through the letters received.

approved and the project is implemented following the agreed plan, the project development objective continues to be achievable.

### **C. PROPOSED CHANGES**

- Results/indicators

5. No change is proposed for the PDO level indicator. However, the intermediate output indicators for each component were modified to adapt to the changes of project components, as listed in Annex 1.

- Components

6. The changes of the project activities aim to provide timely support to the GOC's priority actions in improving the efficiency of thermal power in China. The government put closure of small generation units as a priority action in its 11<sup>th</sup> Five-Year period (2006-2010) and aimed to complete the rehabilitation of medium-size coal-fired thermal power plants in its 12<sup>th</sup> Five-Year period (2011-2015). The re-allocation of the GEF grant in the proposed project restructuring is consistent with the GOC's priority actions in both periods.

7. The proposed changes are made to both Part A and B of the Project, including removal of two activities under Part A.1 and A.2, modification of project activities under Part A.3, and expansion of Part B of the Project, as elaborated below:

- (a) Support to closure of small coal-fired generation units in Shanxi province under Part A.1 has been proposed to be dropped. The closure of small generation units in Shanxi province was accelerated by the provincial government during the 11th Five-Year period (2006-2010), and additional financial incentives were provided by both the central and provincial government. The anticipated social risk caused by the closure of small units (mainly loss of jobs and financial losses for the investors) were mitigated. So the provincial PMO proposed to drop this activity from GEF Financing and reallocate this part of the GEF grant.
- (b) Establishment of the CHP online monitoring system in Shanxi province under Part A.2 has been proposed to be dropped. The provincial government considered not to establish such a monitoring system as the amount of existing CHP units had been reduced substantially after most of the small coal-fired units were closed. So the provincial PMO proposed to drop this activity and reallocate the associated part of the GEF grant.
- (c) Part A.3 was expanded from establishment of provincial-wide electronic bulletin systems regarding emission allowances of small generation units being closed to support the pilot emission trading systems in both Shanxi and Shandong provinces. The provincial Environmental Protection Bureaus (EPBs) in both Shandong and Shanxi province accelerated their steps to promote the emission trading systems in order to meet the stricter targets of pollutants emission reduction imposed by the central government. The project activities

under Part A.3 were modified to fulfill the needs of both EPBs through provision of technical assistance.

- (d) Rehabilitation of three existing power plants has been added to Part B of the Project, including Weihai Power Plant in Shandong, Wuxiang and Taiyuan No. 1 Power Plant in Shanxi province. The selection of the power plant candidates is based on the demonstration technology for rehabilitation, environmental and social impacts, as well as sustainability and replication potential in the province and country, to maximize the value added by the available GEF grant resources. The agreed investment activities include: (i) addition of peak cooling capacity in Wuxiang Power Plant to existing 2x600MWe coal-fired units to reduce the capacity losses in summer and improve the overall thermal efficiency; (ii) integrated rehabilitation in Taiyuan No. 1 Power Plant including installation of phase-transition heat exchangers to recover waste heat from flue gas to pre-heat combustion air and reduce coal consumption; and (iii) integrated rehabilitation in Weihai Power Plant including installation of variable speed drives (VSDs) for primary fans, secondary fans and induced draft fans.

- Safeguards

8. Although the project does not finance the construction of any dams, both the Wuxiang Power Plant and the Taiyuan No. 1 Power Plant to be rehabilitated under the project will withdraw water from reservoirs formed by two existing dams: Guanhe and Jinyanghu. Therefore the OP 4.37, Safety of Dams, is triggered considering the size of the two reservoirs.

- Institutional and implementation arrangements

9. Three new implementing agencies (IAs) are included to be responsible for the rehabilitation of the three additional power plants under Part B of the Project, namely Weihai Botong Heat and Power Co., Ltd., Wuxiang Hexin Power Generation Co., Ltd., and Guodian Taiyuan No. 1 Electricity Generation Co., Ltd.. A Subsidiary Grant Agreement will be signed between each IA and its Provincial Financial Bureau after the Grant Agreement is amended.

10. Early in the project implementation period, Part A of the Project (Closure of Small Coal-fired Generation Units) met with serious delays and it was decided that some activities under this component would be dropped. In June 2011, the National PMO proposed to shift part of the GEF funds from Part A to Part B of the Project (Demonstration of Power Plant Efficiency Improvement). From June 2011 to November 2012, both Shanxi and Shandong PMOs carried out the identification, preparation and government approval processes of alternative subprojects. The Bank team reviewed and appraised these subprojects including from fiduciary and safeguard perspectives. As some of the new subprojects completed the Bank appraisal earlier than others, they started implementation in parallel to the finalization of the appraisal of the remaining subprojects. The Bank team supervised the implementation of these subprojects on an ongoing basis and confirmed that the work and expenditures which have been incurred so far are in compliance with the Bank's policies and guidelines. Government approval has

now been obtained for all subprojects and the final scope of the project restructuring has been agreed and included in this RP. In order to account for the early commencement of implementation of some subprojects, retroactive financing is deemed necessary dating back to October 1, 2011.

- Financing
  - Project Costs and Financing Plan

11. The total project cost was reduced from US\$108.96 million to US\$ 83.15 million based on the latest estimate. The cost reduction was contributed by (i) excluding part of the planned co-finance to support the closure of small generation units due to drop of some activities under the Component; and (ii) cost savings from existing subprojects. The details of the project cost are illustrated in Table 1.

**Table 1. Project Costs and Financing Plan**

Components/Activities	Project Costs (US\$m.)					
	Current			Proposed		
	Total	GEF	CPF	Total	GEF	CPF
MCSU - capitalization	20.00	5.00	15.00	6.12	1.53	4.59
Goods	72.64	7.60	65.04	62.29	9.14	53.15
Services	9.29	5.83	3.46	12.69	8.68	4.01
Project management cost	1.92	0.41	1.51	2.05	0.35	1.70
Contingency	5.11	0.86	4.25	-	-	-
Total Cost	108.96	19.70	89.26	83.15	19.70	63.45

- Disbursement arrangements

12. Total disbursement of GEF grant resources amounted to US\$ 10.29 million as of September 30, 2012. If the eligible expenditures for the three additional power plants are included, total disbursement of the GEF grant plus the pending expenditures to be reconciled amounted to US\$ 13.87 million, 70% of the total Grant. The estimated disbursement of the GEF grant is expected to be US\$ 14.01 million by December 31, 2012, US\$ 17.07 million by June 30, 2013 and US\$ 19.70 million by December 31, 2013.

- Reallocations

13. Reallocations of the GEF grant are proposed as follows: (a) US\$470,000 from Category 3.c MCSU Grant is reallocated to Category 3.a Goods; (b) US\$59,714 from Category 4.b Operation Costs and US\$3,000,000 from Category 4.c MCSU Grant are reallocated to Category 4.a Goods; and (c) US\$859,885 from Category 5 Unallocated is reallocated to Category 1.a Goods. The detailed reallocated Categories are illustrated in Annex 2.

- Financial management (FM)

14. A financial management assessment has been conducted by the Financial Management Specialist regarding the new proposed sub-projects under Part B of the Project. The same FM arrangement (funds flow, internal control, and reporting) that was agreed in 2009 will be followed. The national PMO and provincial PMOs will provide practical and focused training to the new IAs to ensure that staffs understand the FM requirements and disbursement procedures. The FM assessment also concluded that the FM arrangement including the new sub-projects will satisfy the Bank's minimum requirements under OP/BP 10.02.

- Procurement

15. A procurement capacity assessment has been conducted by the Procurement Specialist regarding the three new IAs and they are considered to have adequate procurement capacity to implement the project. The provincial PMOs will facilitate the IAs' carrying out of the procurement activities to ensure the Bank's procurement guidelines are followed. Furthermore, a procurement plan including the packages for the three new sub-projects was reviewed and agreed.

#### **D. APPRAISAL SUMMARY**

16. The Bank team has conducted due diligence work for the three new proposed power plants since June 2011 and considers they are acceptable. The environmental management plans and due diligence reports have been disclosed locally and in the InfoShop. Based on the Bank team's review of the required preparation documents and different implementation schedules of the three subprojects, retroactive financing is proposed to be effective as of October 1, 2011.

17. Triggering the new safeguard policy (Safety of Dams, OP/BP 4.37) has been consulted with the Regional Safeguard Secretariat and clearance was issued on November 29, 2012 to proceed to appraisal from the safeguards perspective for the proposed restructuring.

- Economic and financial analysis

18. The economic and financial analysis was conducted for the three additional power plants to examine their economic and financial viability. The same methodology was adopted to calculate both the economic internal rates of return (EIRR) and financial internal rates of return (FIRR).

19. The EIRRs for Weihai, Wuxiang and Taiyuan No. 1 Power Plant are 32.8%, 25.1% and 16.4% respectively, exceeding both the hurdle level acceptable to the Government of China – the 8% discount rate for investment project recommended by NDRC in 2006, and the 10% EIRR benchmark that is normally applied to Bank's investment projects. The FIRRs for the three sub-projects are 25.4%, 13.0% and 7.7% respectively, which are attractive for the investors. The sensitivity analysis was conducted for both EIRRs and

FIRRs to consider the uncertainty of investment cost and performance of the rehabilitation. The results show both the economic and financial returns are robust.

Table 2. EIRR Calculation and Sensitivity Analysis

Power Plant	EIRR (base case)	Investment cost increased by 10%	Coal saving reduced by 10%
Weihai	32.8 %	28.2 %	28.4 %
Wuxiang	25.1 %	22.5 %	22.2 %
Taiyuan No.1	16.4 %	14.5 %	14.5 %

Table 3. FIRR Calculation and Sensitivity Analysis

Power Plant	FIRR (base case)	Investment cost increased by 10 %	Efficiency gain reduced by 10 %
Weihai	25.4 %	21.3 %	20.8 %
Wuxiang	13.0 %	11.2 %	9.6 %
Taiyuan No.1	7.7 %	6.2 %	5.2 %

- Social

20. Most of the proposed project activities are for technical assistance and will not involve major civil works, except the rehabilitation of the additional three power plants in both Shanxi and Shandong Province, which include mechanical engineering works within the plant facilities and small civil works within the plant boundary. There are no resettlement or Indigenous Peoples related issues.

- Environment

21. The project is still classified as a “Category B” project according to the magnitude of the environmental issues involved, the coverage area and the nature of the project activities associated with the thermal power plant efficiency improvement.

22. The rehabilitation of the selected power plants under Part B of the Project will result in significant benefits to the natural and socio-economic environment in the project areas, including avoided coal handling and combustion due to efficiency improvement in power generation and with consequent reductions in emissions of PM<sub>10</sub>, CO<sub>2</sub>, SO<sub>x</sub> and NO<sub>x</sub>. No serious adverse or irreversible environmental impacts are envisaged. The adverse environmental impacts identified are very limited, temporary and localized (mainly the noise and dust near to construction sites within the power plant during the construction phase) and can be avoided or mitigated to acceptable levels, provided the mitigation measures developed in the EMPs are properly implemented.

- Safety of Dams

23. The two reservoirs have been operated satisfactorily and safely. The dam owners and management teams put strong emphasis on dam safety and the inspectors have more than ten year of experience. The dam safety was enhanced with the completion of rehabilitation of Guanhe reservoir in 2004 and the ecological restoration for Jinyanghu

Lake in 2012. The dam safety performance can meet practical operation requirements for both power plants.

24. For the purposes of ensuring safety of Jinyanghu and Guanhe Dams in relation to the Wuxiang Hexin Power Generation Co.,Ltd and Guodian Taiyuan No.1 Electricity Generation Co.,Ltd. under Shanxi Respective Parts of the Project, it was agreed that Shanxi shall:

- (a) Prepare a dam safety report, as a part of the Project progress reports, which shall include, inter alia, the actions related to dam safety measures already taken and such actions planned to be taken in the next phases; the safety status of the dams; and the operation and maintenance status (including emergency preparedness); and
- (b) Provide support to the World Bank to enable it to visit the dams' sites when necessary and provide relevant information concerning the dams' safety to the World Bank upon request.”
- (c) Take promptly any additional safety measures, and carry out promptly any remedial work, recommended by the government and the World Bank in related to the dams.

**ANNEX 1:**  
**Results Framework and Monitoring**  
**CHINA: THERMAL POWER EFFICIENCY**

Outcome Indicators	Baseline (2007)	Target Values					Data Collection and Reporting		
		Year 1 (2009)	Year 2 (2010)	Year 3 (2011)	Year 4 (2012)	Year 5 (2013)	Frequency and Reports	Data Collection Instruments	Resp. for Data Collection
Reduction in average coal consumption per unit of coal-fired electricity output in selected provinces	SX: 373 gce/kWh SD: 382 gce/kWh GD: 342 gce/kWh	SX: 370 SD: 378 GD: 342	SX: 364 SD: 374 GD: 337	SX: 361 SD: 371 GD: 335	SX: 357 SD: 369 GD: 332	SX: 354 SD: 366 GD: 330	Annually; Project Progress Report	Provincial Government Statistics	SX: PEO SD: PMO GD: GDGP
Reduction of GHG emission per unit of coal-fired electricity output in selected provinces	SX: 1,020 kgCO <sub>2</sub> /MWh SD: 1,045 kgCO <sub>2</sub> /MWh GD: 935 kgCO <sub>2</sub> /MWh	SX: 1,012 SD: 1,034 GD: 935	SX: 996 SD: 1,023 GD: 922	SX: 987 SD: 1,015 GD: 916	SX: 977 SD: 1,009 GD: 908	SX: 970 SD: 1,002 GD: 900	Annually; Project Progress Report	Provincial Government Statistics	SX: PEO SD: PMO GD: GDGP
<b>Results Indicators for each Component</b>									
<b>Component 1:</b>									
(i) Cumulative capacity of small thermal units closed down	SD: 1717 MW	SD: 2717	SD: 3517	SD: 4300			Semi-annually; Project Progress Report	Verification by NDRC	SD: PMO
(ii) CHP on-line Monitoring System operational	SD: no	SD: no	SD: yes	SD: yes	SD: yes	SD: yes			

<p><b>Component 2:</b></p> <p>(i) Increase in thermal efficiency of targeted plants/units</p> <p>(ii) Annual coal savings and GHG emission reduction from targeted plants / units</p>	<p><u>Thermal efficiency</u></p> <p>YG: 35.3%</p> <p>HT: 40.3%</p> <p>BJ: 57.0%</p> <p><b>WH:</b></p> <p><b>WX:</b></p> <p><b>TY:</b></p> <p><u>Coal savings / GHG emission reduction</u></p> <p>YG: 0.0 million tce / 0.0 million tone</p> <p>HT: 0.0 million tce / 0.0 million tone</p> <p>BJ: 0.0 million tce / 0.0 million tone</p> <p><b>WH: 0.0 million tce / 0.0 million tone</b></p> <p><b>WX: 0.0 million tce / 0.0 million tone</b></p> <p><b>TY: 0.0 million tce / 0.0 million tone</b></p>	<p><u>Efficiency</u></p> <p>YG: 35.8%</p> <p>HT: 44.4%</p> <p>BJ: 66.8%</p> <p><b>WH: -</b></p> <p><b>WX: -</b></p> <p><b>TY: -</b></p> <p><u>Savings / reduction</u></p> <p>YG: 0.04 / 0.11</p> <p>HT: 0.17 / 0.47</p> <p>BJ: 0.06 / 0.16</p> <p><b>WH: -</b></p> <p><b>WX: -</b></p> <p><b>TY: -</b></p>	<p><u>Efficiency</u></p> <p>YG: 35.8%</p> <p>HT: 44.4%</p> <p>BJ: 66.8%</p> <p><b>WH: 75.5%</b></p> <p><b>WX: 37.9%</b></p> <p><b>TY: 40.6%</b></p> <p><u>Savings / reduction</u></p> <p>YG: 0.04 / 0.11</p> <p>HT: 0.17 / 0.47</p> <p>BJ: 0.06 / 0.16</p> <p><b>WH: 0.00 / 0.00</b></p> <p><b>WX: 0.00 / 0.00</b></p> <p><b>TY: 0.00 / 0.00</b></p>	<p><u>Efficiency</u></p> <p>YG: 35.8%</p> <p>HT: 44.4%</p> <p>BJ: 66.8%</p> <p><b>WH: 75.5%</b></p> <p><b>WX: 38.4%</b></p> <p><b>TY: 40.6%</b></p> <p><u>Savings / reduction</u></p> <p>YG: 0.04 / 0.11</p> <p>HT: 0.17 / 0.47</p> <p>BJ: 0.06 / 0.16</p> <p><b>WH: 0.00 / 0.00</b></p> <p><b>WX: 0.014 / 0.031</b></p> <p><b>TY: 0.00 / 0.00</b></p>	<p><u>Efficiency</u></p> <p>YG: 35.8%</p> <p>HT: 44.4%</p> <p>BJ: 66.8%</p> <p><b>WH: 77.9%</b></p> <p><b>WX: 38.4%</b></p> <p><b>TY: 40.9%</b></p> <p><u>Savings / reduction</u></p> <p>YG: 0.04 / 0.11</p> <p>HT: 0.17 / 0.47</p> <p>BJ: 0.06 / 0.16</p> <p><b>WH: 0.007 / 0.017</b></p> <p><b>WX: 0.014 / 0.031</b></p> <p><b>TY: 0.008 / 0.023</b></p>	<p>Semi-annually; Project Progress Report</p>	<p>Measurements at power plants</p>	<p>YG/WX/T Y &amp; SX PEO, HT/BJ/WH &amp; SD PMO</p>
<p><b>Component 3:</b></p> <p>(i) Operation of dispatch simulation system</p> <p>(ii) Implementation of information disclosure</p> <p>(iii) Pilot implementation of the Financial Compensation Mechanism</p> <p>(iv) Pilot operation of ESD system</p> <p>(v) Report on assessment of the ESD pilot in all the five pilot provinces</p>	<p>Pilot ESD system developed by GDGP, no simulation system operational</p> <p>No detailed requirements on information disclosure</p> <p>No financial compensation mechanism</p>	<p>Simulation system, information disclosure system &amp; comp. mechanism agreed by NDRC</p>	<p>Operation of the simulation system, information disclosure system &amp; financial comp. mechanism and pilot ESD system</p>	<p>Report on assessment of pilot programs in all the five provinces, including GD, and recommendations on improvements</p>		<p>Semi-annually; Project Progress Report</p>	<p>M&amp;E by IAs</p>	<p>GDGP &amp; National PMO (NDRC)</p>

<p><b>Component 4:</b> Performance of procurement, FM and other project management activities</p>	<p>Satisfactory performance for project preparation activities</p>	<p>Ensuring smooth project implementation</p>	<p>Semi-annually; Project Progress Report</p>	<p>M&amp;E by IAs; external auditors</p>	<p>All PMOs/PEO GDGP</p>
<p><b>Component 5:</b> Use of incremental operating budget</p>	<p>Satisfactory performance in use of PPG Grand</p>	<p>Ensuring compliance with the project Financial Management Manual</p>	<p>Semi-annually; Project Progress Report</p>	<p>M&amp;E by IAs; external auditors</p>	<p>All PMOs/PEO GDGP</p>

Note: The changes are marked in bold text in this table.

**ANNEX 2:  
Reallocation of Proceeds**

---

*CHINA — THERMAL POWER EFFICIENCY  
P098654  
TF094204-CN*

1. Proceeds for *China, Thermal Power EFFICIENCY, TF094204-CN, P098654* will be reallocated as follow:

Category of Expenditure	Allocation		% of Financing	
	Current	Revised	Current	Revise
1. Under Recipient's Respective Parts of the Project:			100%	100%
(a) Goods (including installation), consulting services, and training	2,856,543	3,716,428		
(b) Operating Costs	205,000	205,000		
2. Under GDPG's Respective Parts of the Project:			100%	100%
(a) Goods (including installation), consulting services, and training	2,770,000	2,770,000		
3. Under Shandong's Respective Parts of the Project:				
(a) Goods (including installation), consulting services, and training	4,489,715	4,959,715	100%	100%
(b) Operating Costs	101,714	101,714	100%	100%
(c) MCSU Grant	2,000,000	1,530,000	100% of MCSU Grant amount disbursed	100% of MCSU Grant amount disbursed
4. Under Shanxi's Respective Parts of the Project:				
(a) Goods (including installation), consulting services, and training	3,315,429	6,374,858	100%	100%
(b) Operating Costs	101,714	42,285	100%	100%
(c) MCSU Grant	3,000,000	(deleted)		
5. Unallocated	859,885	(deleted)		
<b>TOTAL AMOUNT</b>	<b>19,700,000</b>	<b>19,700,000</b>		