



## **Part I: Project Information**

### **GEF ID**

10770

### **Project Type**

FSP

### **Type of Trust Fund**

GET

### **CBIT/NGI**

CBIT No

NGI No

### **Project Title**

China Energy Transition Towards Carbon Neutrality Project

### **Countries**

China

### **Agency(ies)**

World Bank

### **Other Executing Partner(s)**

National Energy Administration

### **Executing Partner Type**

Government

### **GEF Focal Area**

Climate Change

### **Sector**

Renewable Energy

### **Taxonomy**

Focal Areas, Climate Change, Climate Change Mitigation, Financing, Renewable Energy, Influencing models, Transform policy and regulatory environments, Demonstrate innovative approaches, Strengthen institutional capacity and decision-making, Stakeholders, Civil Society, Academia, Non-Governmental Organization, Private Sector, SMEs, Financial intermediaries and market facilitators, Type of Engagement, Participation, Consultation, Gender Equality, Gender results areas, Access to benefits and services, Knowledge Generation and Exchange, Gender Mainstreaming, Capacity, Knowledge and Research, Capacity Development, Knowledge Generation, Workshop, Knowledge Exchange, North-South, Field Visit

**Rio Markers**

**Climate Change Mitigation**

Principal Objective 2

**Climate Change Adaptation**

No Contribution 0

**Biodiversity**

No Contribution 0

**Land Degradation**

No Contribution 0

**Submission Date**

10/13/2023

**Expected Implementation Start**

6/30/2024

**Expected Completion Date**

6/30/2029

**Duration**

60In Months

**Agency Fee(\$)**

1,568,807.00

**A. FOCAL/NON-FOCAL AREA ELEMENTS**

<b>Objectives/Programs</b>	<b>Focal Area Outcomes</b>	<b>Trust Fund</b>	<b>GEF Amount(\$)</b>	<b>Co-Fin Amount(\$)</b>
CCM-1-1	De-centralized renewable power with energy storage	GET	14,431,193.00	250,024,212.00
CCM-1-3	Accelerating energy efficiency adoption	GET	3,000,000.00	51,975,788.00
<b>Total Project Cost(\$)</b>			<b>17,431,193.00</b>	<b>302,000,000.00</b>

## **B. Project description summary**

### **Project Objective**

Facilitate energy transition towards carbon neutrality in the electricity and heating sector through supporting development of policies at national level and piloting implementations in selected province(s)

<b>Project Component</b>	<b>Component Type</b>	<b>Expected Outcomes</b>	<b>Expected Outputs</b>	<b>Trust Fund</b>	<b>GEF Project Financing( \$)</b>	<b>Confirmed Co- Financing(\$)</b>
------------------------------	---------------------------	------------------------------	-----------------------------	-----------------------	---	--

Project Component	Component Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
1. National Policy and Regulatory Framework for the Energy Transition	Technical Assistance	Legal framework improved to facilitate the energy transition in the electricity and heating sector; national roadmap and action plans for the energy transition improved; electricity market reform advanced; renewable energy integration capacity enhanced; incentive mechanisms for renewable energy consumption on demand side developed; policy framework for a just transition improved; scale up and replication of successful provincial pilot and demonstrati	Analysis on legal framework for the energy transition in the electricity and heating sector; international best practice in developing roadmaps and action plans for the energy transition; analysis and suggestions on electricity market reforms to cope with the increasing penetration of variable renewable energy; technical analysis on interprovincial transmission arrangement and energy storage deployment for improving renewable energy integration; suggestions on promoting renewable energy consumption on demand side; policy suggestions on supporting a just transition of	GET	4,500,000.00	1,000,000.00

Project Component	Component Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
		on supported through national level policy measures	coal-dependent regions; knowledge and lessons from provincial pilot and demonstration under Component 2			

Project Component	Component Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
2. Provincial Pilot and Demonstration	Investment	Renewable energy development in the selected pilot provinces accelerated compared to the baseline scenario; heat supply from clean energy and heat consumption saving increased in the selected pilot province	Analysis and suggestions on provincial policy and regulatory framework and institutional capacity building for heating sector decarbonization; design of provincial electricity market reform and digitalization and optimization of grid operation and dispatch for high RE penetration; design of green energy consumption certificate system and monitoring platform for green energy consumption on demand side; monitoring and evaluation framework for carbon emissions accounting from industrial parks and policy suggestions for low-	GET	10,500,000.00	298,000,000.00



Project Component	Component Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
			carbon transition of industrial parks; platform for digitalizing grid operation and dispatch practice and monitoring renewable energy consumption on demand side			
3. Capacity Building and Project Management	Technical Assistance	Institutional capacity for implementing the energy transition in the electricity and heating sector improved; Capacity for monitoring and evaluation and gender actions strengthened	Monitoring and evaluation of project output and outcome; institutional capacity building through training, workshops and study tours; stakeholder engagement and consultation; gender action implementation	GET	2,257,193.00	
<b>Sub Total (\$)</b>					<b>17,257,193.00</b>	<b>299,000,000.00</b>
<b>Project Management Cost (PMC)</b>						
	GET		174,000.00			3,000,000.00

**Project Management Cost (PMC)**

---

<b>Sub Total(\$)</b>	<b>174,000.00</b>	<b>3,000,000.00</b>
<b>Total Project Cost(\$)</b>	<b>17,431,193.00</b>	<b>302,000,000.00</b>

---

**Please provide justification**

**C. Sources of Co-financing for the Project by name and by type**

<b>Sources of Co-financing</b>	<b>Name of Co-financier</b>	<b>Type of Co-financing</b>	<b>Investment Mobilized</b>	<b>Amount(\$)</b>
GEF Agency	The World Bank	Loans	Investment mobilized	300,000,000.00
Recipient Country Government	NEA	Grant	Investment mobilized	1,000,000.00
Recipient Country Government	NEA	In-kind	Recurrent expenditures	1,000,000.00
<b>Total Co-Financing(\$)</b>				<b>302,000,000.00</b>

**Describe how any "Investment Mobilized" was identified**

The World Bank will provide co-financing of US\$300 million from the Heating Sector Decarbonization in Shaanxi Project, which is under preparation and expected to be approved by the World Bank Board of Directors in March 2024. This project will finance investment in heating sector reform and decarbonization building on the provincial pilot in Shaanxi province under Component 2. Furthermore, the National Energy Administration (NEA), the implementing agency of the project, will provide US\$2 million of co-financing under Component 1 and 3, in a form of budget allocation and in-kind support from technical experts.

**D. Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds**

<b>Agency</b>	<b>Trust Fund</b>	<b>Country</b>	<b>Focal Area</b>	<b>Programming of Funds</b>	<b>Amount(\$)</b>	<b>Fee(\$)</b>	<b>Total(\$)</b>
World Bank	GET	China	Climate Change	CC STAR Allocation	17,431,193	1,568,807	19,000,000.00
<b>Total Grant Resources(\$)</b>					<b>17,431,193.00</b>	<b>1,568,807.00</b>	<b>19,000,000.00</b>

**E. Non Grant Instrument**

NON-GRANT INSTRUMENT at CEO Endorsement

---

Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

**F. Project Preparation Grant (PPG)**

PPG Required **true**

**PPG Amount (\$)**

**PPG Agency Fee (\$)**

<b>Agency</b>	<b>Trust Fund</b>	<b>Country</b>	<b>Focal Area</b>	<b>Programming of Funds</b>	<b>Amount(\$)</b>	<b>Fee(\$)</b>	<b>Total(\$)</b>
<b>Total Project Costs(\$)</b>					<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

## Core Indicators

### Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)	80000000	4400000	0	0
Expected metric tons of CO <sub>2</sub> e (indirect)	0	69000000	0	0

### Indicator 6.1 Carbon Sequestered or Emissions Avoided in the AFOLU (Agriculture, Forestry and Other Land Use) sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)				
Expected metric tons of CO <sub>2</sub> e (indirect)				
Anticipated start year of accounting				
Duration of accounting				

### Indicator 6.2 Emissions Avoided Outside AFOLU (Agriculture, Forestry and Other Land Use) Sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)	80,000,000	4,400,000		
Expected metric tons of CO <sub>2</sub> e (indirect)		69,000,000		
Anticipated start year of accounting	2023	2024		
Duration of accounting	20	20		

### Indicator 6.3 Energy Saved (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Total Target Benefit	Energy (MJ) (At PIF)	Energy (MJ) (At CEO Endorsement)	Energy (MJ) (Achieved at MTR)	Energy (MJ) (Achieved at TE)
Target Energy Saved (MJ)				

### Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Technology	Capacity (MW) (Expected at PIF)	Capacity (MW) (Expected at CEO Endorsement)	Capacity (MW) (Achieved at MTR)	Capacity (MW) (Achieved at TE)
------------	---------------------------------	---	---------------------------------	--------------------------------

**Indicator 11 People benefiting from GEF-financed investments**

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
<b>Female</b>	1,300,000	156,000		
<b>Male</b>	2,800,000	164,000		
<b>Total</b>	4100000	320000	0	0

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

In Indicator 6, please refer to the Annex 2 of the Project Appraisal Document for additional explanation. On Indicator 11, the number of direct beneficiaries has been estimated based on the planned investment in heating sector decarbonization under the World Bank co-financing in Shaanxi province. A total of 126,000 households will be connected to the heating systems that are financed and directly benefit from heat supply from clean energy and improved energy efficiency. Based on the National Population Census in 2020, the average household size in Shaanxi is 2.53 and the female ratio in the province is 48.83 percent. Therefore, the total number of direct beneficiaries is estimated to be 320,000, of which female is 156,000



## **Part II. Project Justification**

### **1b. Project Map and Coordinates**

**Please provide geo-referenced information and map where the project interventions will take place.**





## 2. Stakeholders

Please provide the Stakeholder Engagement Plan or equivalent assessment.

Stakeholder Engagement Plan is attached

During the project preparation, consultations with multiple types of stakeholders have been made for their opinions and suggestions. These stakeholders include government agencies (e.g., NEA, NDRC), enterprises (both private and state-owned) covering generation companies (e.g., State Power Investment Corporation, China Huaneng Group, China Xiexin Group), grid companies (State Grid, China Southern Grid, Inner Mongolia Grid), manufactures (e.g., solar PV panel, wind turbine, and battery), service providers, thinktanks (mainly research institutes and universities), industrial associations (renewable, energy storage), and international agencies (UK embassy, AFD, KfW, GIZ). Different seminars were held by NEA and the World Bank to consult with these stakeholders in

collecting project ideas and finalizing the project design. Further consultation has been conducted with selected provincial governments and potential investors of the pilot projects, organized by NEA. Expanded consultation has been arranged to cover research institutes, design institutes, manufactures, industrial associations, and international agencies, to evaluate the impacts of the project activities.

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement

During the project implementation, consultation will be arranged with stakeholders following the Stakeholder Engagement Framework. When implementing relevant technical assistance activities, the PMO will identify relevant stakeholders and define stakeholder engagement requirements in TOR. Contractors will be requested to provide detailed and feasible stakeholder engagement arrangements as part of their proposals and conduct accordingly during implementation. When deliverables are submitted by the contractors, the PMO will conduct extensive consultations on research findings with all relevant stakeholders. Component 3 is budgeted to support stakeholder engagement during project implementation.

**Select what role civil society will play in the project:**

**Consulted only; Yes**

**Member of Advisory Body; Contractor;**

**Co-financier;**

**Member of project steering committee or equivalent decision-making body;**

**Executor or co-executor;**

**Other (Please explain)**

### **3. Gender Equality and Women's Empowerment**

**Provide the gender analysis or equivalent socio-economic assesment.**

A gender gap analysis was conducted by interviews with PMO staff, networks of women in renewable energy, and desk review. A gender gap exists globally between men and women in terms of the longevity of their careers in science and technology fields and retention of women in Science, Technology, Engineering, and Mathematics (STEM) in China (of which the renewable energy workforce is a part) is also a problem. Despite progress, women in the renewable energy sector in China remain underrepresented, with the proportion of female workers at 27.45 percent compared with

a global average of 32 percent. However, with the growing share of clean energy in the energy mix, the potential for female employment in this sector is high and it has been estimated that it can grow from 1.12 million jobs in 2018 to 3.56 million by 2050. Key barriers for women to enter and remain in the sector include: gender stereotypes that influence hiring practices and individual professional choices, lack of awareness and information about job opportunities in the sector, limited access to professional networks, and lack of gender sensitive policies to balance career and household and care work. In addition, the lack of sex-disaggregated data on the situation of women in the sector limits the capacity to formulate targeted gender equality policies, including for financing female entrepreneurs. Interview of women employees in RE sector companies indicated facing barriers to build a career in the sector and limits to career progression as an important disincentive. Social economic survey also finds women have the main responsibility for carrying out unpaid household care work, they are closely related to the use of energy, and especially heating facilities which are mainly coal stoves in semi-urban and rural areas. Also see attached Gender Analysis and Action Plan

**Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment?**

Yes

**Closing gender gaps in access to and control over natural resources;**

**Improving women's participation and decision making** Yes

**Generating socio-economic benefits or services or women**

**Does the project's results framework or logical framework include gender-sensitive indicators?**

Yes

**4. Private sector engagement**

**Elaborate on the private sector's engagement in the project, if any.**

Private sector plays an important role in China's energy transition in the electricity and heating sector. While the rapid scale-up of renewable energy capacity is primarily driven by state-owned enterprises (SOEs), the private sector still represents about 15 percent of annual incremental renewable energy capacity. More importantly, the private sector dominates manufacturing and supply industry of renewable energy equipment, including solar PV panels and wind turbines, as well as battery storage, all of which are critical to advance energy transition. During project preparation, consultations with active private sector players have taken place in identifying challenges to the energy transition, collecting project ideas and finalizing project design. During project implementation, the private sector will continue to be engaged, as part of technical assistance activities, as legal, policy and regulatory framework for renewable energy and innovative solutions may have a substantial implication on private sector development.

## 11. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

### Overall Project/Program Risk Classification \*

PIF	CEO Endorsement/Approval	MTR	TE
High or Substantial	High or Substantial		

#### Measures to address identified risks and impacts

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

#### A. Environmental and Social Risk Classification (ESRC)

Substantial

##### A.1 Environmental Risk Rating

Substantial

The project has overall environmental benefits of promoting energy transition in the pilot provinces through increasing RE penetration and reducing the share of coal power in the power sector, and therefore reducing both local air pollutants and GHG emission, and contributing to climate change mitigation.

As the key implementing agency of the project, the National Energy Administration (NEA) has been implementing GEF renewable energy programs since 2006 and therefore, has acquired extensive experience with the Bank's safeguards policies, and have strong technical capacity regarding policy development and project management. NEA has a satisfactory track record of safeguard management in previous Bank projects (e.g. P067625 and P127033 First and second phase of the renewable energy scale-up program, P162299 Distributed renewable energy scale-up project). Some potential participating pilot provinces/cities also have experience in implementing the Bank's projects. Although this project will be the first for NEA and some participating provinces to prepare and implement under

the Environmental and Social Framework (ESF), both the national and provincial borrowers have the technical capacity to implement the project to meet the objectives of the ESSs, including good international industry practice (GIIP) as an integral part of project design. Capacity and awareness of GIIP at local level (e.g., cities and counties) is comparatively weaker. A time-bound capacity development plan has been developed in the ESMF and ESCP and will be implemented to support the project implementation, through which the capacity of particularly PMOs at the local level will be strengthened with regards to ESF implementation.

The World Bank

China Energy Transition Towards Carbon Neutrality Project (P175708)

Oct 07, 2023 Page 6 of 13

For Official Use Only

The proposed project will only invest on Technical Assistance (TA) activities, including country-wide policy studies, provincial pilots of policy applications, and capacity building to enable a dominant role of renewable energy. The project development will adopt a framework approach as the specific studies, pilots and participating provinces will be determined during project implementation. Implementation of TA activities under the project will not cause any direct adverse environmental impacts but will involve significant stakeholder engagement and potentially have downstream impacts due to the implementation of policy/regulation changes and pilot investments to be informed by the project-supported TA activities, which would need to be considered and addressed during the TA process. The TA outputs of Component 1 are expected to have implications in relevant sectors nationwide, while part of Component 2 will support preparatory analytic work to inform future physical investments at the provincial level. For example, the future implementation of improved grid regulation and dispatch practice is expected to replace coal- and natural gas-based power plants that are currently used for grid regulation and renewable energy integration, which could involve consequent environmental risks/impacts during the decommissioning of power plants; also, TA deliveries exploring opportunities to facilitate renewable energy penetration should also consider the environmental, health and safety requirements in the development of various renewable energy, which might include, but not limited to solar thermal generation, geothermal heating, applications of battery storage, compressed air and thermal storage, and interprovincial transmission network. The overall environmental risk is therefore rated substantial at this stage given the pilot subproject uncertainty and potential downstream environmental impacts and risks from TA activities. The risk rating will be revisited during implementation based on the project progress and the confirmed provincial TA activities.

## A.2 Social Risk Rating

Substantial

The Project would not support physical investment or the direct formulation of policies or regulations, but would involve conducting various researches relating to actions such as, Support policy and regulatory framework to facilitate the energy transition in the electricity and heating sector and address

key barriers; Heating sector decarbonization; Renewable energy integration; Promoting renewable energy consumption on demand side; and Capacity building and project management. It will bring social benefits such as slowdown of global warming, alleviation of natural disaster caused by extreme weather, reduction of air pollutant emission and improvement of air quality, acceleration of economic development, increase of job opportunity, and reduction of social cost on carbon emission, etc. The TAs-generated direct social risks include: inadequate stakeholder engagement and exclusion risks of vulnerable groups (ethnic minority, low-income residents, to-be-laid-off workers, etc.), and low health and safety risks for TA consultants during their fieldwork. The training, visits, etc. involve health and safety risks for PMO and consulting staff; cultural compatibility should be considered for ethnic minorities. At the same time, the downstream social implications could be substantial in spatial extent. The recommendations of the studies may trigger potential substantial downstream activities. The transition or closure of the coal mining, coal power, electricity grid or natural gas industries may result in increased production costs and worker unemployment or displacement; the development of new energy and storage facilities may result in impacts and risks to LAR, OHS and community health and safety. In addition, the energy transition may increase the instability of electricity supply and increase the construction and operation/use costs of grid companies and users. Considering the downstream impacts, the ESS5 and ESS8 are also considered in the ESMF. The project social risks are mainly related to ESS1, ESS2, ESS5, ESS7, and ESS10. The overall social risk is deemed as Substantial.

**Supporting Documents**

Upload available ESS supporting documents.

Title	Module	Submitted
<b>GEF ID 10770_China Energy Transition_ESRS</b>	<b>CEO Endorsement ESS</b>	
<b>Concept ESRS China Energy Transition</b>	<b>Project PIF ESS</b>	



**ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).**

Also see PAD pages 24-28

Note on the Results Framework: As per World Bank policy and practice, the Results Framework of a World Bank project includes only indicators that measure outputs/outcomes supported by the financing provided by the World Bank and are measurable within the implementation period of the World Bank project. The World Bank does not distinguish direct and indirect GHG emissions so it cannot be done in the results framework. Please refer to annex 2 for the detailed breakdown between direct and indirect GHG emission reductions estimates.

**PDO Indicators by PDO Outcomes**

Baseline	Closing Period
<b>Facilitate energy transition towards carbon neutrality in the electricity and heating sector</b>	
<b>Avoided annual GHG emissions (Tones/year)</b>	
Mar/2024	Jun/2029
0	3,670,000
<b>Incremental renewable energy installed capacity enabled in selected pilot provinces (Gigawatt)</b>	
Mar/2024	Jun/2029
0	17.9
<b>Incremental heat supply capacity from clean energy sources in the selected pilot province (Megawatt)</b>	
Mar/2024	Jun/2029
0	450

**Intermediate Indicators by Components**

Baseline	Closing Period
<b>National Policy and Regulatory Framework for the Energy Transition</b>	
<b>New or revised laws/policies/regulations to facilitate energy transition (Number)</b>	
Mar/2024	Jun/2029
0	8
<b>Number of technical assistance activities that include specific chapters on gender analysis and corresponding measures to promote gender equality (Number)</b>	
Mar/2024	Jun/2029
0	5

<b>Provincial Pilot and Demonstration</b>	
<b>Incremental annual heat supply from clean energy or heat consumption saving in the selected pilot province (Mega Joules (MJ))</b>	
Mar/2024	Jun/2029
0	2,000,000,000
<b>Incremental renewable energy consumption/generation in the selected pilot provinces (Gigawatt-hour (GWh))</b>	
Mar/2024	Jun/2029
0	6600
<b>Renewable energy consumption monitoring system developed in the selected pilot provinces (Yes/No)</b>	
Mar/2024	Jun/2029
No	Yes
<b>Number of direct beneficiaries in the selected pilot province (Number)</b>	
Mar/2024	Jun/2029
0	320000
<b>?Number of female direct beneficiaries (Number)</b>	
Mar/2024	Jun/2029
0	156000
<b>Capacity Building and Project Management</b>	
<b>Number of people participated in capacity building and training activities (Number)</b>	
Mar/2024	Jun/2029
0	2000
<b>Share of women participants in stakeholder consultation, capacity building and training that are conducted as part of the Project (Percentage)</b>	
Mar/2024	Jun/2029
20	40

**Monitoring & Evaluation Plan: PDO Indicators by PDO Outcomes**

<b>Facilitate energy transition towards carbon neutrality in the electricity and heating sector</b>	
<b>Avoided annual GHG emissions (Tones/year)</b>	
Description	This indicator measures GHG emissions avoided as a result of the project. GHG emissions reduction would have come from incremental renewable energy installed capacity in four pilot provinces and incremental annual heat supply from clean energy or heat consumption saving in the selected province for heating sector decarbonization under Component 2.
Frequency	Mid-term/final evaluation
Data source	PMO M&E report
Methodology for Data Collection	PMO M&E
Responsibility for Data Collection	PMO
<b>Incremental renewable energy installed capacity enabled in selected pilot provinces (Gigawatt)</b>	
Description	This indicator measures incremental renewable energy installed capacity that would have been enabled in selected pilot provinces, due to the project that facilitates and accelerates energy transition in the power sector. Annex 2 provides detailed description on methodologies.
Frequency	Mid-term/final evaluation
Data source	PMO M&E report
Methodology for Data Collection	PMO M&E
Responsibility for Data Collection	PMO
<b>Incremental heat supply capacity from clean energy sources in the selected pilot province (Megawatt)</b>	
Description	This indicator is from Heating Sector Decarbonization in Shaanxi Project (P177841), which is an IBRD-financed parallel operation to complement the provincial pilot in Shaanxi under Component 2. It measures the outputs of investment financing under the parallel operation in terms of incremental heat supply capacity from clean energy.
Frequency	Biannual
Data source	Bank Implementation Support and Results Report (ISR) of the IBRD project

Methodology for Data Collection	PMO M&E
Responsibility for Data Collection	PMO

**Monitoring & Evaluation Plan: Intermediate Results Indicators by Components**

<b>National Policy and Regulatory Framework for the Energy Transition</b>	
<b>New or revised laws/policies/regulations to facilitate energy transition (Number)</b>	
Description	The number of new or revised laws, policies, or regulations that would have been informed by technical assistance activities of the project will be monitored.
Frequency	Biannual
Data source	PMO implementation progress report
Methodology for Data Collection	PMO M&E
Responsibility for Data Collection	PMO
<b>Number of technical assistance activities that include specific chapters on gender analysis and corresponding measures to promote gender equality (Number)</b>	
Description	Technical assistance activities, particularly to inform government policies and plans, are encouraged to have specific chapters to promote gender equality. The chapter includes how to encourage women's participation in employment and promote women's employment as well as ensuring equal opportunities for promotion and career development for women in the sector.
Frequency	Biannual
Data source	PMO implementation progress report
Methodology for Data Collection	PMO M&E
Responsibility for Data Collection	PMO
<b>Provincial Pilot and Demonstration</b>	

<b>Incremental annual heat supply from clean energy or heat consumption saving in the selected pilot province (Mega Joules (MJ))</b>	
Description	This indicator is from Heating Sector Decarbonization in Shaanxi Project (P177841), which is an IBRD-financed parallel operation to complement the provincial pilot in Shaanxi under Component 2. It measures the outputs of investment financing under the parallel operation, including incremental annual heat supply from clean energy or incremental annual heat consumption saving.
Frequency	Biannual
Data source	Bank Implementation Support and Results Report (ISR) of the IBRD project
Methodology for Data Collection	PMO M&E
Responsibility for Data Collection	PMO
<b>Incremental renewable energy consumption/generation in the selected pilot provinces (Gigawatt-hour (GWh))</b>	
Description	Electricity generated from incremental renewable energy generation capacity enabled by the project in the selected pilot provinces, as estimated in Annex 2. Following the methodology in Annex 2, only 30 percent of the electricity outputs will be recorded in the results framework and attributed to the project.
Frequency	Mid-term/final evaluation
Data source	PMO M&E report
Methodology for Data Collection	PMO M&E
Responsibility for Data Collection	PMO
<b>Renewable energy consumption monitoring system developed in the selected pilot provinces (Yes/No)</b>	

Description	Under the pilot theme of promoting renewable energy consumption on demand side, selected province(s) plan to develop a renewable energy consumption monitoring system to track consumption at the firm level to identify baseline and inform policy measures and incentives to boost demand from end-user side.
Frequency	Biannual
Data source	PMO implementation progress report
Methodology for Data Collection	PMO M&E
Responsibility for Data Collection	PMO
<b>Number of direct beneficiaries in the selected pilot province (Number)</b>	
Description	Number of people that are benefitted directly from the pilot in heating sector decarbonization in Shaanxi province
Frequency	Biannual
Data source	Bank Implementation Support and Results Report (ISR) of the IBRD project
Methodology for Data Collection	PMO M&E
Responsibility for Data Collection	PMO
<b>Number of female direct beneficiaries (Number)</b>	
Description	Number of female that are benefitted directly from the pilot in heating sector decarbonization in Shaanxi province
Frequency	Biannual
Data source	Bank Implementation Support and Results Report (ISR) of the IBRD project

Methodology for Data Collection	PMO M&E
Responsibility for Data Collection	PMO
<b>Capacity Building and Project Management</b>	
<b>Number of people participated in capacity building and training activities (Number)</b>	
Description	Monitoring participation and the number of beneficiaries of capacity building and training activities that are implemented as part of the project.
Frequency	Biannual
Data source	PMO implementation progress report
Methodology for Data Collection	PMO M&E
Responsibility for Data Collection	PMO
<b>Share of women participants in stakeholder consultation, capacity building and training that are conducted as part of the Project (Percentage)</b>	
Description	Planned technical assistance activities will include stakeholder consultation during implementation. The results of the activities will be disseminated through capacity building and training. Among the target audience, including experts, residents, government officials, beneficiaries, etc., 40 percent female participation rate should be met.
Frequency	Biannual
Data source	PMO implementation progress report
Methodology for Data Collection	PMO M&E



Responsibility for Data Collection	PMO
------------------------------------	-----

**ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).**

**GEF Council and STAP Comments Received and Response Matrix**

**GEF ID 10770 ? China: Energy Transition Towards Carbon Neutrality Project (P175708)**

Comments received	Team's responses
<b>STAP</b>	
<p>1 This project like the other major China carbon mitigation project in this round of review (transport sector ? project 10790) purports to support Green Hydrogen technologies. While this is laudable, the way in which this would be operationalized is less clear in this project, whereas in the transport sector project the focus on ports and shipping vessels made it clearer and more tangible. Given that green hydrogen is still at the developmental stage with many hurdles to overcome, its successful implementation in this project could provide needed evidence for more adoption across China and elsewhere.</p>	<p>The design of the project has evolved reflecting changes in circumstance as well as priorities over the past two years of project preparation. Supporting green hydrogen under Component 2 is not part of the project anymore.</p>
<p>2 Battery storage and coal power plant repurposing are also two additional features of the pilot which are noted but details are lacking. For example, are there new battery technologies which will be explored beyond lithium ion variations? Further details are needed.</p>	<p>The project is designed to support optimizing the use of energy storage to facilitate renewable energy integration, with a focus on improving grid operation and dispatch practice as well as advancing electricity market reforms to provide compensation for the services provided by the storage. The project will cover various energy storage technologies, including lithium-ion battery storage, pumped hydro storage, compressed air, and thermal storage among others. Supporting coal power plant repurposing is not part of the project anymore.</p>

Comments received		Team's responses
3	<p>Potential risk from climate change on the proposed interventions were identified and remedial measures were stated. The underlying information used to identify these risks were missing, such as the project impacts of climate change in the targeted regions. Given the substantial possible implications of climate change on renewable energy as well as on infrastructure in China (see example publications on this below), we recommend that a more comprehensive climate risk assessment should be carried out. The World Bank's Climate and Disaster Risk Screening Tool (<a href="https://climatescreeningtools.worldbank.org/">https://climatescreeningtools.worldbank.org/</a>) is an excellent resource in this regard.</p>	<p>Climate risk assessment has been carried out, using the World Bank's Risk Screening Tool, and updated in the project document.</p>
4	<p>Further, the overall project risk is rated as high. Given this, it is vital that an adequate risk monitoring and evaluation protocol be put in place and adaptive management measures are built into the project design and implementation plan.</p>	<p>The overall project risk is rated Substantial, following the World Bank's Systematic Operations Risk-rating Tool (SORT). Ten risk categories and proper risk mitigation measures have been identified and reflected in the project design. During implementation, the World Bank will regularly re-assess project risk and report in the Implementation Status and Results Report (ISR), which will be disclosed to the public.</p>
5	<p>The project expects to mitigate 80 billion metric tons of CO<sub>2</sub>e (preliminary estimates at the PIF stage). This is substantial and achievable, but information on how this number was arrived at is missing. We encourage the proponent to provide more details on the baselines and assumptions used to calculate the expected greenhouse gas reduction.</p>	<p>This is elaborated in Annex 2 of the Project Appraisal Document (PAD). The estimate at the PIF stage was 80 million tCO<sub>2</sub>e (lifecycle), not billion.</p>
<p><b>GEF Council ? Canada</b></p>		

Comments received	Team's responses
<p data-bbox="269 266 883 443">1 Canada believes that by building capacities for long-term carbon neutrality policy and regulations in several selected Chinese provinces and cities, this project will contribute to the mitigation of global emissions, in addition to enhancing public health in China.</p> <p data-bbox="323 537 883 714">This project is well aligned with China's pledges in the Paris Agreement. Indeed, the country committed, through its NDCs, to reach the target of reducing carbon intensity by 60 to 65% below 2005 level, by 2030 and achieve carbon neutrality before 2060.</p> <p data-bbox="323 816 883 932">In alignment with UNFCCC COP guidance, the GEF-7 Climate Change Focal Area Strategy supports the transition towards climate-resilient development pathways, as outlined in this project.</p> <p data-bbox="323 1035 883 1211">Notwithstanding the importance of the project and its alignment with Global Environmental Benefits, it should demonstrate in a more robust way its anchoring within the three fundamental objectives emphasized in the GEF-7 Climate Change Focal Area Strategy:</p> <ul data-bbox="323 1247 883 1549" style="list-style-type: none"> <li data-bbox="323 1247 883 1304">? Promote innovation and technology transfer for sustainable energy breakthroughs;</li> <li data-bbox="323 1339 883 1430">? Demonstrate mitigation options with systemic impacts (e.g. developing carbon sinks through urban forests); and</li> <li data-bbox="323 1465 883 1549">? Foster enabling conditions for mainstreaming mitigation concerns into sustainable development strategies.</li> </ul>	<p data-bbox="901 266 1419 898">The design of the project is closely aligned with the first objective of the GEF-7 Climate Change Focal Area Strategy ? promote innovation and technology transfer for sustainable energy breakthroughs. While the project is to demonstrate mitigation options across the electricity and heating sector, which is relevant to the second objective, it is not linked with any of the GEF-7 impact programs. The project will also contribute to the third objective on fostering enabling conditions for mainstreaming mitigation concerns into sustainable development strategies, as it will particularly support improving national-level legal and policy framework for the energy transition and developing policy measures at the provincial level to drive specific energy transition areas, including heating sector decarbonization, renewable energy integration and promoting renewable energy consumption on demand side.</p>

Comments received		Team's responses
2	A major component for achieving the project's goal relies on the capacity building for transparency, when it comes to monitoring emission reductions. Indeed, establishing an Enhanced Transparency Framework that provides a clear understanding of the actions taken and their impact on climate change, in light of Article 13 of the Paris Agreement, will be essential for tracking progress.	The progress and achievement of the project will be tracked through monitoring and evaluation (M&E) framework as suggested in the M&E plan, which will be implemented by the PMO housed under NEA. Some of the planned activities will also aim to monitor and track renewable energy consumption at enterprise level, enhancing capacity and transparency in energy consumption and carbon emissions accounting.
<b>GEF Council ? Germany</b>		
1	The proposal sets several indicators for key results that seem duplicative of existing (or planned) government targets (cp. PID section ?C. Proposed Development Objectives?). Thus, it seems difficult to know to what extent the project results were additional to the development the government would have targeted anyway (e.g., the amount of battery storage capacity installed is considered as one of the intermediate project indicators). However, the government recently announced a draft target for 30 GW of energy storage capacity by 2025.)	Incremental cost analysis has been conducted to clarify the additionality of the project, particularly on GHG emissions reduction and renewable energy installed capacity. This is elaborated in Annex 2 of the Project Appraisal Document (PAD). The indicator on battery storage capacity installed is dropped.
2	Therefore, Germany recommends that for each indicator a clear methodology is laid out how a change in indicator values can be unmistakably attributed to project interventions as opposed to business-as-usual. China has immense and rapidly growing vRE capacity, but wind and solar account for just 10% of electricity generation. In order to avoid (additional) coal plants to meet rising electricity load, direct electricity consumption and electrification of easy-to-electrify sectors such as light-duty-vehicles, is expected to be the most economical and energy-efficient solution for RE integration in the short to mid-term future.	This is elaborated in Annex 2 of the Project Appraisal Document (PAD).  The share of electricity from wind and solar is increasing fast, reaching about 17 percent in the first half of 2023. EV penetration is also growing fast in China, in line with the comment.

Comments received	Team's responses
<p>3 Therefore, Germany suggests green hydrogen pilots ? and related indicators ? be carefully designed to avoid removing vRE output from direct consumption or electrification. An indicator of tons of green hydrogen produced does not seem narrowly tailored to achieve low-carbon objectives, since it will likely lead to less vRE entering the grid for direct use, thus resulting in a net increase of emissions. The project places a high emphasis on pilot projects, especially in coal-heavy regions. Germany supports the pilot project concept, but notes that Chinese pilot projects, especially when involving international assistance, frequently suffer various problems.</p>	<p>The design of the project has evolved reflecting changes in circumstance as well as priorities over the past two years of project preparation. Supporting green hydrogen and coal power repurposing under Component 2 is not part of the project anymore.</p>
<p>4 Provinces compete for federal government approval when pursuing pilot projects, which are typically funded by SOEs and enjoy an implicit government guarantee. Thus, provinces may tailor pilot projects (e.g., in the field of energy storage and hydrogen) to achieve recognition and attract investment, rather than to produce scalable results or lasting environmental benefits. Stakeholder involvement is often not a major criterion for project design.</p> <p>Germany suggests targets and indicators to be formulated around stakeholder involvement, renewable utilization and carbon reduction rather than quantitative targets like tons of green hydrogen or quantities of energy storage added, which may exacerbate the at times narrow-minded competition for pilot project approval. In order to avoid competitive implementation, duplication of efforts and leverage synergies, Germany strongly recommends coordinating with the following actors and their programs during project preparation as well as implementation: GIZ China, Energy Foundation China, Regulatory Assistance Project (RAP), Natural Resources Defense Council (NRDC), Rocky Mountain Institute (RMI).</p>	<p>The Stakeholder Engagement Framework (SEF) has been developed to guide the process of stakeholder engagement during project implementation. The project does not support any pilot investment directly, rather support TA for policy and regulatory framework and institutional capacity building for monitoring and planning, to address key bottlenecks in the selected provinces, including renewable energy integration, promoting renewable energy consumption, and heating sector decarbonization. Each of the TA activities will include proper stakeholder engagement process in the TOR. The draft SEF has been consulted during project preparation. It will be disclosed locally in the next couple of months on the government website as well as on the Bank's external website once it is reviewed by the Bank and finalized.</p> <p>The World Bank team has been in close coordination with development partners, particularly those based in Beijing, China, in developing this project and shaping overall energy sector engagement to support energy transition in China. The team will keep coordinating closely with them during implementation.</p> <p>The project indicators are revised following the comments received. Indicators on tons of green hydrogen and MW/MWh of energy storage added have been dropped.</p>

Comments received	Team's responses
<b>GEF Council ? Norway/Denmark</b>	
1	The proposed project is of high relevance, both in the context of China's recently announced target to aim for carbon neutrality in 2060, the target to peak emissions by 2030 and for the achievement of global climate goals in line with the UNFCCC and the Paris Agreement. It also holds potential to strengthen the sectorial implementation of China's 14th Five Year Plan but it is necessary to await the 14th Five-Year Plan, currently under review, before interventions can be planned in more detail.
2	It would strengthen the project proposal if the project document could provide more details on how the pilot work or project interventions at city and provincial level will feed into the national policy formulation on energy transition.
The project took over two years for preparation. During the time, 14th Five Year Plan has been launched and scaled up renewable energy deployment significantly as recognized in the project document. The project has been designed to address the challenges that China is currently facing during the rapid expansion of renewable energy in the electricity sector, including integration of the fast-growing RE and RE consumption.	Component 1 includes activities that will take experience and lessons from provincial pilots under Component 2 and reflect in the national policy framework. Component 1 will contribute to the enabling legal, policy and regulatory framework in line with China's dual carbon goals in the first years of implementation, expected 2024-2025. Under Component 2, pilot provinces will implement planned technical assistance during the same period to inform new policies, regulations, reforms and approaches and pilot them to specific sites in the later years, expected around 2026-2028. Component 1 will conduct evaluation of provincial pilot and demonstration experience and generate knowledge and lessons, towards project closure around 2028-2029, to further inform national level policies to scale up and replicate successful approaches.
3	The proposed project is addressing key issues and challenges to overcome in order to accelerate the necessary transition in the Chinese power sector. This includes the constraints related to the grid and province inter-connectivity, which need to be tackled as soon as possible in order to allow for renewable energy to replace coal-based energy. It will be key to take already ongoing work in this area into account.
Indeed, the project activities will build on international practices in grid interconnection and electricity market reforms to facilitate renewable energy integration.	4
It would further strengthen the project if it was aligned with and sought synergies with ongoing work on the establishment of China's national carbon market as well as ongoing work on China's power market reform. Other issues that should be addressed in order to further develop the project are pricing mechanisms, subsidies and energy efficiency.	Planned activities of the project will look into these important aspects, including electricity market reforms and pricing mechanisms, as indicated in the project document. There will be opportunities to link with the ongoing emission trading schemes or demand-side energy efficiency in some of the provincial pilots.

Comments received		Team's responses
5	Ensuring a just transition will be crucial to get governments everywhere and at all levels on-board in working for an accelerated energy transition, and the project's focus on creating job opportunities, also for women, within the renewable energy sector is commendable.	Component 1 includes technical assistance activities to prepare policy and regulatory framework for a just transition to mitigate economic, social and environmental impacts of the transition, particularly on coal-dependent regions.
6	The project document and assessments recognize the need for solid coordination on all levels. NDRC's role in this coordination will be crucial, both when it comes to the necessary involvement of sector ministries as well as provinces and state-owned enterprises. Project partners could be challenged on how they foresee to secure the necessary ownership to the project within NDRC when developing the project further.	The project will be implemented by the National Energy Administration (NEA), which is one of the national bureaus managed by NDRC and responsible for policy formulation in the energy sector. Planned activities are mainly to inform policies and regulations in the energy sector, which requires coordination between NEA and NDRC for official adoption and implementation. NEA will seek coordination through NDRC in relevant areas during project implementation. At provincial level, relevant provincial department, such as development and reform commission (DRC), department of energy or department of housing and urban-rural development, will closely coordinate with NEA during implementation.
7	We note that the majority of the identified risks being classified as substantial or high, and that the overall risk is also assessed to be high. We would like to commend project partners for being open about their risk assessment and stress that there is a strong need to focus on risk mitigation throughout the further development and implementation of the project. Also in this work, it will be important to engage with NDRC.	The overall project risk is rated Substantial, following the World Bank's Systematic Operations Risk-rating Tool (SORT). Ten risk categories and proper risk mitigation measures have been identified and reflected in the project design. During implementation, the World Bank will regularly re-assess project risk and report in the Implementation Status and Results Report (ISR), which will be disclosed to the public.
8	Support the recommendation from STAP to provide more details on the baselines and assumptions used to calculate the expected greenhouse gas reduction.	This is elaborated in Annex 2 of the Project Appraisal Document (PAD).

### **ANNEX C: Status of Utilization of Project Preparation Grant (PPG).**

**(Provide detailed funding amount of the PPG activities financing status in the table below:**

Not applicable, project doesn't have PPG

### **ANNEX D: Project Map(s) and Coordinates**





<b>Goods</b>	Under Component 2, some selected provinces plan to procure equipment for establishing platforms for digitalizing grid operation and dispatch practice and monitoring renewable energy consumption on demand side.	-	4,000,000	-	4,000,000	-	-	4,000,000	National Energy Administration (NEA)
<b>Vehicles</b>		-	-	-	-	-	-	-	n/a
<b>Grants/ Sub-grants</b>		-	-	-	-	-	-	-	n/a
<b>Revolving funds/ Seed funds / Equity</b>		-	-	-	-	-	-	-	n/a
<b>Sub-contract to executing partner/ entity</b>		-	-	-	-	-	-	-	n/a
<b>Contractual Services ? Individual</b>	?	-	-	-	-	-	-	-	n/a
<b>Contractual Services ? Company</b>	?	4,200,000	6,500,000	407,193	11,107,193	100,000	-	11,207,193	National Energy Administration (NEA)

<b>International Consultants</b>	Component 3, M&E and PMC plan to engage individual international consultants for capacity building and expert advice on subject matters.	-	-	200,000	20,000	50,000	-	2 50,000	National Energy Administration (NEA)
<b>Local Consultants</b>	Component 1 includes budget allocation to local consultants for some TA activities. M&E and PMC budget on local consultants cover all consultant staff that are required for project management and M&E and hired by PMO.	300,000	-	300,000	60,000	3 50,000	1 30,000	1,0 80,000	National Energy Administration (NEA)
<b>Salary and benefits / Staff costs</b>		-	-	-	-	-	-	-	n/a

<b>Trainings, Workshops, Meetings</b>	Training and workshops based on the output of the project are all planned under Component 3.	-	-	500,000	50,000	-	-	500,000	National Energy Administration (NEA)
<b>Travel</b>	Component 3 includes travel budget for study tours for knowledge exchange on the energy transition. M&E and PMC also include some travel budget to support PMO's monitoring, evaluation and project management of provincial pilots under Component 2	-	-	300,000	30,000	50,000	30,000	380,000	National Energy Administration (NEA)
<b>Office Supplies</b>	Office supplies needed for project management at PMO	-	-	-	-	-	14,000	14,000	National Energy Administration (NEA)

<b>Other Operating Costs</b>		-	-	-	-	-	-	-	National Energy Administration (NEA)
<b>Grand Total</b>		4,500,000	10,500,000	1,707,193	16,707,193	550,000	174,000	17,431,193	

**ANNEX F: (For NGI only) Termsheet**

Instructions. Please submit an finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

**ANNEX G: (For NGI only) Reflows**

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agency is required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

**ANNEX H: (For NGI only) Agency Capacity to generate reflows**

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies' capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).