

MID-TERM REVIEW

Project ID:	10366
Project Name:	Enabling Zero Carbon Energy in Rural Towns and Villages in China (EZCERTV) Project
Countr(ies):	China
Implementing Agency:	UNDP

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I. Overview

A. Description

Project name

Enabling Zero Carbon Energy in Rural Towns and Villages in China (EZCERTV) Project

Country

China

GEF ID

10366

Implementing Agency

UNDP

Executing Entity

Ministry of Agriculture and Rural Affairs (MARA)

Trust Fund

GET

Project Type

FSP

Objective

Acceleration of zero-carbon transformation in China's rural area to contribute to global climate change mitigation and the achievement of the United Nations sustainable development goals (SDGs).

B. Key Dates

CEO Endorsement/Approval

12/18/2021

Agency Approval

7/29/2022

Implementation Start

7/29/2022

First Disbursement

3/20/2023

Expected MTR

1/29/2025

MTR Submission

3/2/2026

Actual MTR

1/9/2026

Expected Completion

7/29/2027

II. PROGRESS STATUS AND ISSUES

A. Main MTR Findings

Progress in Zero-Carbon Village Development and Technology Demonstration

The project has achieved significant and satisfactory milestones. Detailed feasibility studies have been completed for all nine (9) demonstration villages outlined in the project document, with comprehensive

energy plans and implementation schemes formulated. Pilot construction projects have commenced, with key infrastructure expected to be completed between late this year and early next year. Nationwide, zero-carbon demonstration technologies have been promoted, with forty (40) pilot villages selected for implementation. The project partners and villagers are now owning the concept and advancing construction based on the project's principles and recommended technical models. MARA, among leading agencies of the Government, is spearheading the program in view of its commitment to energy transition towards more reliable and affordable application of LZCT technologies, particularly for rural areas. The relevant Component 3 activities have reached rural towns and villages through LZCT demonstrations, thus increasing the number of beneficiaries and participants appreciating the socio-economic benefits of LZCTs in the course of project implementation.

Policy Support

Since the project's inception through June 30, 2025, fourteen (14) national and local policy documents on low/zero-carbon initiatives have been issued. This demonstrates the Government's strong commitment to renewable energy, energy conservation, and energy efficiency technologies. By vigorously developing renewable energy and reducing carbon emissions, the initiative addresses global climate change and rural development. The Project will continue to assist and monitor the enforcement of these policies and regulations and ensure impacts are realized until EOP, with systems in place to sustain outcomes beyond the Project timeframe. National institutions take care of central policy, regulations, financing, organization, and leadership, while local agencies focus on promotion and awareness of the rational use of LZCT-generated electricity for domestic and productive applications. The target number of policies under Component 1 has been developed and is currently enforced, with additional regulations in place to reinforce them.

Cumulative Greenhouse Gas Reduction and Fossil Fuel Consumption Reduction

Current monitoring data only covers nine (9) demonstration villages in 2024 and the first half of 2025. Based on the PIR 2025, preliminary progress in CO₂ GHG reduction shows a total of 108,010.27 tCO₂ cumulative reduction in fossil fuel consumption across eight (8) demo sites, exceeding the mid-term target of 100,000 tCO₂, while pilot LZCT demo constructions are still in progress. The estimated GHG reduction is mainly derived from the application of key technologies such as building energy-saving renovation, household appliance energy efficiency improvements, photovoltaic direct flexible and distributed photovoltaics, biogas, air-source heat pumps, and biomass solid fuels. With the addition of forty (40) new pilot villages in 2025 and the projected one hundred sixty-one (161) extension villages in 2026, the project is expected to achieve its cumulative carbon reduction and fossil fuel consumption reduction targets by the end of the project. However, as shown in Table 3 (Page 16) and other related sections, the achieved level remains well below the target value expected at EOP.

Emphasizing Women's Participation

The project has established multiple thematic tasks for publicity and capacity building within participating provinces, explicitly requiring increased female participation in activities, enhanced knowledge training for women, and guidance for men to recognize women's crucial roles in households. Current training outcomes demonstrate high female engagement in promotional activities. Through these programs, women have gained knowledge of low-carbon technologies and products, such as recommending energy-efficient household appliances and converting traditional wood-burning stoves to electric ones, which significantly improve indoor environments and reduce labor burdens. As key decision-makers in rural households, increased women's involvement can effectively promote the adoption of low-carbon technologies and products in rural areas. It is noted that the total number of project beneficiaries at mid-term remains below targeted values for the first three years; however, this is expected to increase as more pilot demonstrations and information dissemination activities are implemented, leading to greater female involvement in the coming years. As explained in Section 3.2.1, the total number of beneficiaries reached by the Project is very low compared to

targeted values, although gender balance is consistently observed. Women's roles in energy use enabled by LZCTs for household and commercial activities cut across broader aspects of rural life, including social, economic, environmental, health, and living standards. Their awareness, training, capacity building, and recognition constitute important contributions to the transition towards low/zero-carbon villages.

Due to the still low level of involvement, the continuous integration of gender equality into the mainstream of all project activities and the expansion of female beneficiaries in the coming years remain a challenge in achieving near- and long-term LZCT transition goals.

Villagers' Satisfaction with Project Implementation

The planning and implementation of each demonstration village are developed based on replicable, scalable, and sustainable development requirements, while ensuring no harm to villagers' interests. This is supported by completed social and environmental screening (SES) studies and action planning conducted in compliance with Government and GEF requirements. During project development and the MTR process, village constituents and households have begun to own energy transition decisions at the local level and to benefit from LZCT application and construction initiatives. Villagers have experienced reduced living costs, improved living environments, and enhanced village aesthetics as overall project benefits. These benefits arise through income generation from productive applications, own-use solar photovoltaic power generation, or replacement of liquefied petroleum gas (LPG) and other fossil fuels with LZCT alternatives. Villagers spontaneously share the benefits and changes brought by the Project, expressing strong satisfaction with its implementation. While Component 3 activities have begun reaching rural towns and villages through LZCT demonstrations, training, and information activities, the overall impact remains low; however, the trend shows increasing numbers of beneficiaries and participants appreciating the socio-economic benefits of LZCTs as project implementation progresses.

Financial Support for Achieving Outputs and Installing Planned LZCT Applications

GEF funds have been regular, sufficient, and prudently spent to support all planned Project activities and pilot LZCT demonstrations. These funds are intended for incremental investments to complement co-financed portions and related baseline projects supported through government and private initiatives, thereby advancing the overall LZCT transition program in rural areas of China. As an indicative observation, the total amount contributed by co-financing partners from Government and the private sector had reached USD 33,853,038 at mid-term, representing approximately 37% of the committed co-financing value of USD 89,600,000. Construction and investment plans for all LZCT applications across eight provinces are well defined and firmed up. Nearly all (98.7%) co-financing contributions realized at mid-term are in the form of mobilized investments leveraged by the Project, with the remainder allocated to recurrent expenditures. As noted in Section 3.4.2, almost 99% of co-financing from both Government and private sector sources is investment-related, with minimal recurrent expenditures, consistent with the ProDoc design. While there was strong investor interest during the project design stage, the proportion of realized commitments must increase significantly to ensure the Project reaches its goals and objectives within the agreed timeframe.

Sustainability of Results and Outcomes at Mid-term

Overall, progress is positive and encouraging. Rural sector leaders and villagers have begun to support and own LZCT applications; policies are in place; environmental benefits from GHG reduction and energy savings are evident; women have recognized and embraced their important roles; LZCT end-users have realized tangible improvements; and there is a clear manifestation of favorable investment appetite. Interviews with Project participants indicate strong expectations that this momentum will be sustained as planned activities and pilot construction works are completed towards EOP and beyond. Nevertheless, substantial progress is still required to meet objective indicators related to (1) beneficiaries with increased women's participation, (2) CO₂ reduction, and (3) fossil energy savings, as shown in Table 3 (Page 16) and related

sections. The PMO is expected to closely monitor these indicators through regular coordination meetings and engagements with national and provincial partners, private companies, and contracted professional service providers to ensure identified implementation risks are effectively and sustainably addressed, keeping the Project on track.

B. Stakeholder Engagement

The Project implementation is On Track, which means that activities continue to be carried out through effective and timely coordination of financial management, contracting and performance management, coordination and communication among national and local levels of governance, Project Steering Committee (PSC) meetings and related decision-making, and overall adaptive management when necessary. The unique challenges in the installation and successful operation of the LZCT demonstrations in rural areas will continue to be addressed through adaptive management, close monitoring, and remedial action when necessary.

Project implementation and adaptive management across most of the seven components—management arrangements, work planning, finance and co-finance, project-level monitoring and evaluation systems, stakeholder engagement, reporting, and communications—are leading to efficient and effective project implementation and adaptive management, except for a few components that remain subject to remedial action.

China Academy of Building Research (CABR), Institute of Building Environment and Energy, is a key partner in the EZCERTV Project. CABR's nearly zero-energy building was visited to observe applications of heat pumps (powered by solar heating appliances on the roof) and solar photovoltaics (PVs) integrated into the building's walls (BIPV). Another CABR building powered by solar PV technologies, including window-mounted solar cells, BIPVs, and DC-powered appliances, was also visited. These technologies demonstrated CABR's strong expertise as a Project partner.

MARA has undertaken various steps to select the nine pilot areas. An agreement was signed with CABR to carry out village-level implementations. Extensive stakeholder engagements were conducted with local authorities and village communities during the preparation and data gathering for the feasibility studies.

The Project has been undertaking detailed stakeholder consultations in the pilot villages. The strategy laid out by the Project partner CABR and the Project Management Unit foresees detailed consultations with local villagers to shape the exact content of the demonstrations. For instance, in Xinxing Village of Hubei Province, EZCERTV conducted surveys with locals on their needs and the condition of existing infrastructure. The findings guided the demonstration design through the addition of building retrofits.

The EZCERTV team will continue these engagements for the upcoming demonstration sites as well. In addition, the Project will establish or utilize existing governance mechanisms at the village level to ensure the management and maintenance of Project pilot demonstrations.

The commitment and active participation of key stakeholders have been pivotal in achieving Project milestones and meeting targets. Their dedication and efforts are highly valued and have contributed significantly to the overall success of the Project.

C. Gender Equality

The Project has included gender equity into its activities as designed in the ProDoc, as well as aligning implementation with the Gender Analysis and Action Plan recommended in the ProDoc. At the management level, women's representation increased from 66.7% to 75%, ensuring that their perspectives shape decision-making and contribute to a more inclusive, gender-balanced environment. The All-China Women's Federation (ACWF) has been part of the PSC since the project's inception, advocating for gender equality in its objectives. Local women's federations, such as in Hebei's "Beautiful Courtyard" evaluation, have driven women's participation and expanded their benefits. Technical initiatives have ensured an at-least-50% female participation rate in capacity-building training (with gender-tracked sign-ins). Around 36,409 women (including staff, technicians, and villagers) have benefited from meetings and training, gaining skills to take active roles in their communities. These efforts have bolstered environmental and resilience outcomes by increasing rural women's involvement in clean energy initiatives and decision-making processes. This, in turn, leverages their influence as household and community leaders helping to spread sustainable living concepts and drive broader community engagement. In most cases, women assume a leadership and/or working roles in the domestic and social since they are most likely the ones left in the houses and communities because men are usually out for earning a living.

Women's role in energy that can be provided by LZCTs for home and commercial activities, therefore, would cut across in other role aspects of rural life in terms of addressing cross-cutting issues such as social, economic, environmental and health and living standards. Their awareness, training, capacity building and recognition will pose important contributions in transitioning towards low/zero carbon villages.

Because of the still low level of involvement, the continuous integration of gender equality into the mainstream of all project activities and to expand the number of female beneficiaries in the coming years of the Project remains be a challenge in achieving near or long term goals of LZCT transition.

D. Knowledge Management

A strong emphasis was placed on maintaining continuous communication throughout the project implementation. Daily interactions and weekly updates were conducted with the Project Management Offices (PMOs) and key stakeholders to effectively oversee, monitor, and guide the project's progress. By keeping all parties informed and engaged, this approach fostered collaboration, minimized delays, and enhanced the project's overall efficiency and effectiveness.

The Project has developed two key sub-contracts related to knowledge management as part of Component 3 Activity 3.3.2 and 3.3.4. The Project maintained continuous communication through daily interactions and weekly updates between UNDP, the PMO, and key stakeholders. This ongoing engagement facilitated proactive oversight, reduced delays, and enhanced overall project efficiency to keep the implementation on track.

Targeted training sessions provided by UNDP further strengthened the PMO's understanding of UNDP/GEF policies, such as the MTR, refining project management practices and improving work efficiency.

In terms of Knowledge Management, capacity-building efforts for zero-carbon town and village development have been implemented also across 9 provinces and regions in China, through training sessions, promotional activities, and the distribution of educational materials. A subcontract for technical capacity training in "Belt and Road" countries is underway, with guidelines still in development. The final materials are expected to be completed, and training sessions are planned for 2025–2026.

Promotional videos for demonstration sites in 4 provinces have been completed, and those for other regions are in the planning stages. Regular progress has been made in refining technical models and producing

publicity materials, with bidding scheduled for July 2025. The project has also strengthened collaborations to raise awareness among women and youth through training programs, online classes, and school-based activities, ensuring their active participation in zero-carbon initiatives.

III. 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 CO₂e (direct)	4079416	1165400	108010.27	
Expected metric tons of CO₂e (indirect)		2913600		

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 CO₂e (direct)				
Expected metric tons of CO₂e (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 CO₂e (direct)	4,079,416	1,165,400	108,010.27	
Expected metric tons of CO₂e (indirect)		2,913,600	0	
Anticipated start year of accounting		2024	2024	
Duration of accounting		5	1	

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)		13,200,000,000	763,000,000	

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)
Solar Photovoltaic	20.30	157.90	10.47	
Biomass		9.30	0.10	
Biomass		3,902.90	16.24	
Energy Storage			2.32	

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)
Female	630,000	460,000	36,409	
Male	538,500	458,500	39,250	
Total	1,168,500	918,500	75,659	0

IV: Co Financing

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Anticipated at CEO(\$)	Materialized at MTR(\$)
Recipient Country Government	Ministry of Agriculture and Rural Affairs (MARA)	Grant	Investment mobilized	13,200,000.00	7,323,585.00
Recipient Country Government	MARA	In-kind	Recurrent expenditures	1,000,000.00	332,657.00
Recipient Country Government	Department of Agricultural and Rural Affairs of Hebei Province	Grant	Investment mobilized	8,000,000.00	1,657,400.00
Recipient Country Government	Department of Agricultural and Rural Affairs of Shanxi Province	Grant	Investment mobilized	5,000,000.00	3,804,196.00
Recipient Country Government	Department of Agricultural and Rural Affairs of Liaoning Province	Grant	Investment mobilized	5,000,000.00	1,268,700.00
Recipient Country Government	Department of Agricultural and Rural Affairs of Heilongjiang Province	Grant	Investment mobilized	5,000,000.00	2,585,000.00
Recipient Country Government	Department of Agricultural and Rural Affairs of Hubei Province	Grant	Investment mobilized	5,000,000.00	2,481,818.00
Recipient Country Government	Department of Agricultural and Rural Affairs of Yunnan Province	Grant	Investment mobilized	4,000,000.00	1,549,700.00

Recipient Country Government	Rural Energy Workstations of Ningxia Hui Autonomous Region	Grant	Investment mobilized	4,950,000.00	960,100.00
Recipient Country Government	Rural Energy Workstations of Ningxia Hui Autonomous Region	In-kind	Recurrent expenditures	50,000.00	98,000.00
Civil Society Organization	China Association of Rural Energy Industry	Grant	Investment mobilized	5,000,000.00	2,800,000.00
Private Sector	Hebei Jing'an Bioenergy Technology Co., Ltd.	Grant	Investment mobilized	7,000,000.00	3,238,600.00
Private Sector	Shanxi Golden Cooperate DC Power Distribution Engineering Technology Co., Ltd.	Grant	Investment mobilized	10,000,000.00	339,900.00
Private Sector	Chaoyang Jiajiadian Farm Co., Ltd.	Grant	Investment mobilized	3,500,000.00	1,484,000.00
Private Sector	Hailun Limin Energy-saving Boiler Manufacturing Co., Ltd.	Grant	Investment mobilized	3,500,000.00	690,000.00
Private Sector	Songzi Senchun Agricultural Development Co., Ltd.	Grant	Investment mobilized	3,500,000.00	589,245.00
Private Sector	Yunan Fu Hui Technology Co., Ltd.	Grant	Investment mobilized	2,200,000.00	
Private Sector	Ningxia Runwell Energy & Environment Engineering Co., Ltd.	Grant	Investment mobilized	3,500,000.00	2,088,137.00
GEF Agency	United Nations Development Programme (UNDP)	In-kind	Recurrent expenditures	200,000.00	
Private Sector	State Grid Corporation of China Ltd.	Grant	Investment mobilized		562,000.00
Total Co-financing				89,600,000.00	562,000.00

Comments

The MTR Team observed that the co-financing arrangement is regularly monitored by the Commissioning Unit and the Project Team in coordination with the provincial coordinators. Co-financing is being used strategically to help the objectives of the project and to align financing priorities and annual work plans. As

of this MTR, the actual amount contributed by Co-financing partners amounted to USD 33,853.038 or around 37.78% of committed co-financing support though this could increase some more as all the project demonstration construction works are completed.

V: ENVIRONMENTAL AND SOCIAL SAFEGUARDS

Overall Project/Program Risk Classification

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

Measures to address identified risks and impacts

The risk factors were considered in the final design, procurement, installation and operation of the various LZCTs in the demos and replications guided by the site-specific ESMPs. Project M&E provides special attention to beneficiaries, gender equality, youth, indigenous peoples, and activity and engagement in fragile and conflict-affected situations in rural China as this is an area assessed falling short of MTR and EOP expectations.

Special activities have been designed to involve women, incorporated in the Gender Analysis and Action Plan that has been prepared for the EZCERTV Project.

A SES monitoring mechanism has been established to oversee the project implementation and ensure full compliance with SES requirements. Regular quarterly meetings are held with representatives from the BRH and HQ to thoroughly examine SES progress and actions, identify any obstacles that could impede implementation, and take proactive measures to address them effectively.

VI. ANNEX

Uploaded Document

Document Category	Prefix	Title
M and E Document	Tracking Tool	UPDATED EZCERTV MTR Report_Core Indicator.pdf
M and E Document	Mid-term Review (MTR)	GEF10366_UNDP6431_FY25_UNDP_China_Mitigation_FSP
Project Supporting Document	ESS Supporting Document	PIMS 6431 CPR EZCERTV SESP 130621_clean_clean and cleared (1)