



# **Project Implementation Report**

(1 July 2021 – 30 June 2022)

Project Title:	Integrated Adoption of New Energy Vehicles
GEF ID:	9226
UNIDO ID:	150157
GEF Replenishment Cycle:	GEF-6
Country(ies):	CHINA
Region:	EAP - East Asia and Pacific
GEF Focal Area:	Climate Change Mitigation (CCM)
Integrated Approach Pilot (IAP) Programs <sup>1</sup> :	n/a
Stand-alone / Child Project:	Stand-alone
Implementing Department/Division:	ENE / ESI
Co-Implementing Agency:	n/a
Executing Agency(ies):	Ministry of Industries and Information Technology (MIIT)
Project Type:	Full-Sized Project (FSP)
Project Duration:	36
Extension(s):	2
GEF Project Financing:	8,930,000
Agency Fee:	848,350
Co-financing Amount:	117,000,000
Date of CEO Endorsement/Approval:	5/1/2017
UNIDO Approval Date:	5/15/2017
Actual Implementation Start:	7/11/2017
Cumulative disbursement as of 30 June 2022:	8,805,430
Mid-term Review (MTR) Date:	6/1/2021
Original Project Completion Date:	7/11/2020

<sup>&</sup>lt;sup>1</sup> Only for **GEF-6 projects**, if applicable

Project Completion Date as reported in FY21:	3/31/2022
Current SAP Completion Date:	12/31/2022
Expected Project Completion Date:	12/31/2022
Expected Terminal Evaluation (TE) Date:	9/30/2022
Expected Financial Closure Date:	3/31/2023
UNIDO Project Manager <sup>2</sup> :	Ms. Katarina Barunica Spoljaric

## I. Brief description of project and status overview

## **Project Objective**

Facilitation and scale-up of the integrated development of electric vehicles (EVs) with renewable energy (RE) in China

Proje	ect Core Indicators	Expected at Endorsement/Approval stage
4	Support to transformational shifts towards a low-emission and resilient development path	1,343,116 metric tons (for indirect part, used result from "bottom up" approach)

Setting up low-carbon urban transportation demonstration zones in Shanghai and Yancheng cities, by integrating electric vehicles (EV) and renewably sourced electricity (RE), by analyzing policy measures, developing technical regulations, piloting charging infrastructure and grid response, and raising awareness of technology integration.

#### Baseline

In 2015, China surpassed the US as the largest EV market in the world with sales of 247,482 pure electric vehicles and sales of 83,610 plug-in hybrid electric vehicles (PHEVs). The bulk of China's NEVs purchased between 2011 and 2015 have been featured as part of a demonstration program established at the national level and carried out in various pilot cities, the group of which over time has increased to include 39 designated pilot cities or regions and 88 cities in all.

China has made substantial technical progress in EV products and technologies, with some new items headed for globally competitive commercialization.

Current situation of EV policies and programs in China: China's rapidly expanding EV market has largely been driven by China's NEV promotional policies at the national and local levels. Overall, the Government of China's strong emphasis on NEVs is clear from both the breadth and depth of NEV policies that have been issued. Further, local level NEV policies are common and in some cases have achieved strong stimulation of the market. Policymakers at both levels thus show their recognition of the importance of NEV promotion. In addition to subsidies and targets, preferential tax policies for NEVs in China are now

<sup>&</sup>lt;sup>2</sup> Person responsible for report content

substantial and have been shown to have played an important role in stimulating the market. There has also been significant support for scientific and technological innovation in the NEV field. As for charging infrastructure, a number of promotional policies and regulations have been issued.

Current RE power market in China: China has achieved remarkable growth in its RE power sector over the past decade or so. Annual installations continue to propel the nation to new highs of installed RE power capacity, surpassing other nations in many areas. Based on 2015 data, China ranks first in the world in total installed RE power capacity, whether including or excluding hydropower.

Current RE power policy in China: The remarkable growth of wind power and PV power in China's renewable energy power sector has largely been driven by policies.

The power grid and smart grid in China: Among nations, China is the largest consumer of electricity in the world.

Current situation of China's national carbon trading framework: China has been developing an ambitious carbon trading framework. Yet, EV-RE integration is not currently a part of the carbon trading framework's system of rules. Instead, the current focus on the newly designed system is on industrial energy users.

International and Chinese experience with EV-RE integration and foundational aspects to date: Despite the perception held by many that EVs are associated with clean energy, international progress and experience in integrating EVs with RE and in key related foundational technologies, such as smart charging and V2G, is quite limited and just getting started.

Please refer to the explanatory note at the end of the document and select corresponding ratings for the current reporting period, i.e. FY22. Please also provide a short justification for the selected ratings for FY22.

In view of the GEF Secretariat's intent to start following the ability of projects to adopt the concept of adaptive management<sup>3</sup>, Agencies are expected to closely monitor changes that occur from year to year and demonstrate that they are not simply implementing plans but modifying them in response to developments and circumstances or understanding. In order to facilitate with this assessment, please introduce the ratings as reported in the previous reporting cycle, i.e. FY21, in the last column.

Overall Ratings <sup>4</sup>	FY22	FY21
Global Environmental Objectives (GEOs) / Development Objectives (DOs) Rating	Satisfactory (S)	Satisfactory (S)

The project has delivered on a considerable number of outputs during the previous reporting period in order to meet the project's objectives on time. Although the demonstration sites in Yancheng were moved to Qingdao, the project has still been able to deliver on its global environmental objectives. The terminal evaluation will provide further insight in the overall efficacy of the project in delivering GEOs / DOs.

Implementation Progress (IP) Rating	Satisfactory (S)	Satisfactory (S)
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<sup>&</sup>lt;sup>3</sup> Adaptive management in the context of an intentional approach to decision-making and adjustments in response to new available information, evidence gathered from monitoring, evaluation or research, and experience acquired from implementation, to ensure that the goals of the activity are being reached efficiently

<sup>&</sup>lt;sup>4</sup> Please refer to the explanatory note at the end of the document and assure that the indicated ratings correspond to the narrative of the report

Despite delays due to COVID-19 lockdowns as well as a change in demonstration sites from Yancheng to Qingdao, the projects considerable amount of activities were completed by the end of 2021. The project's terminal evaluation however has been postponed as site visits have not been possible in 2022 due to COVID-19 travel restrictions in China.

Overall Risk Rating	Moderate Risk (M)	Moderate Risk (M)
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The terminal evaluation has begun, however, it presently has been delayed due to COVID-19 travel restrictions. There is a moderate risk that challenges related to site visits for the evaluation will persist, however, this risk will be continued to be monitored and adaptive measure taken if necessary and appropriate to ensure the evaluation is completed in line with the extension.

## II. Targeted results and progress to-date

Please describe the progress made in achieving the outputs against key performance indicator's targets in the project's **M&E Plan/Log-Frame at the time of CEO Endorsement/Approval**. Please expand the table as needed.

Please fill in the below table or make a reference to any supporting documents that may be submitted as annexes to this report.

Project Strategy	KPIs/Indicators	Baseline	Target level	Progress to-date				
Component 1 - Policies ar	Component 1 – Policies and Programs							
	Outcome 1: Drafted and recommended policies, technical standards, and guidelines that provide regulatory and planning elements, leading to the higher adoption of EV-RE integration schemes by city governments, vehicle manufacturers, and consumers, thus resulting in GHG emission reductions							
Output 1.1 Recommended national level-policy instruments, (a) roadmap for effective EV-RE integration, (b) regulation and incentive for EV-RE micro grids, (c) regulation and incentivize use of retired batteries.	Policy package formulated Recommended policy package on RE/EV integration, regulations and incentives for charging and battery retirement and balancing of grid developed and discussed relevant authorities	0	12	National roadmap completed, agreed upon and published  Suggested polices and frameworks that promote balancing of grid load with power generated via utilization of EVs, thus providing a foundation for scale-up of EV-RE integration:  • Load balancing and Smart charging guidelines  • Policy suggestions developed on RE micro-grids  • Technical Roadmap 2.0 for Energy Saving and New Energy Vehicles and Roadmap for the Integration of NEVs and Renewable Energy  • Technical Guidelines for Orderly Charging and Demand Side Mechanism Strategy  • Shanghai Development and Reform Commission on Revising the Interim Measure for the Orderly Development of Charging (replacement) interconnection of electric vehicles  Proposed national-level polices to regulate and incentive systems for the charging of EVs				

				with RE, including those integrating either RE micro-grid or grid-based large-scale RE installations:  New Energy Vehicle Industry Development Plan (2021-2035) Implementation Opinions on Further Improving the Service Guarantee Capacity of Charging and Battery Swapping Infrastructure. Guidance on Accelerating the Development of New Energy Storage Action Plan for Carbon Peakbefore 2030  Proposed national-level policy instruments to regulate and incentivize use of retired EV batteries: Report on China's New Energy Vehicle Power Battery Recycling Industry
				Interim Provisions on the management of secondary-hand utilization of power storage tanks
Output 1.2: Issuance of technical standards and specifications facilitating EV-RE integration and scale up, including standards and specifications for: (a) energy management centers (b) smart charging systems; (c) V2G systems; (d) retired EV batteries; (e) battery safety of mobile charging systems; (f) fire protection system; (g) workshop on on standard frame work	Technical standards formulated and handed to authorities Recommended technical standards and specifications on RE/EV integration for energy management centers, smart charging stations, V2G systems, retired EV batteries, battery safety for mobile charging systems, fire protection systems	0	6	Research on standards related to Vehicle Power Battery Recycling for new energy vehicles contributing to published standards  • Standard on Vehicle Power Battery Recycling-Secondary-hand utilization-part 2 – Disassembly requirements • Vehicle Power Battery Recycling Management Part 1 Specification for Packaging and Transportation  Research on key technologies of fire safety of power battery secondary-hand utilization  • Report completed that analyzes scenarios and current status of fire safety of secondary utilities of EV batteries • Four group standards related to fire safety of power battery second- hand utilization were completed  Research on two-way interactive practice and standard system of electric vehicle charging and discharging (V2G)  • Published Electric Vehicle Charging and Battery Swapping Service Information Exchange – Part 6: Technical Specification for Charging and Battery Swapping Equipment Access to Charging Service Platform  • Group Standard on Electric Vehicle Charging and Battery Swapping Service Information Exchange – Part 9: Functional Specification of Management Information Platform • Applied to China Electric Power Enterprise Federation for group standard "Management Center for Integration of Electric Vehicles and Power Grid" and completed first draft of the standard • Draft Chinese industry standard, "Electric vehicle charging and

Output 1.3: Recommendations presented to transport sector authorities for incorporation of incentives for EV charging with RE in transport sector national carbon trading policies, including carbon trading rules for EVs powered by RE, to promote greater adoption of RE in the grids supplying electricity to EVs	Status of proposal to incorporate charging of EVs with RE into national carbon trading systems (1= submitted to government, 0=not yet submitted to government)	0	1	discharging – two way interaction Part 1: General Principles"  Draft standard "Communication protocol between electric vehicle non-vehicle conductive charger and battery management system"  Research on carbon trading rules completed. Research on carbon neutralization roadmap completed.
Output 1.4: City-level RE-EV integration and scale up plans, including replication plansfor the adoption of best models demonstrated in Shanghai and Yancheng	plans	0	6	Shanghai demonstration projects: Shanghai Donghaolansheng Guozhan Real Estate Co., Ltd "bus smart charging project of parking lot 5 complex supporting the National Convention and Exhibition Center" Shanghai Electric Distributed Energy Technology Co., Ltd - "PV storage microgrid power generation project of Shanghai Yangpu machine tool plant" Shanghai Nio Automobile Co., Ltd "charge change PV storage integration project of electric vehicle charge change combination" Shanghai Electric Power University - "technology demonstration project of electric vehicle inheriting renewable energy microgrid" Shanghai Space Power Supply Institute - "integrated application demonstration project of PV storage and charging in composite application scenario"  Qingdao demonstration projects 72 charging stations and 1071 charging piles built Stations include public transport, logistics, public enterprises, and institutions residential areas and other application scenarios
Output 1.5: Proposed institutional plan to establish responsibilities of and coordination among various government organizations for EV-RE integration	Number of different ministries reviewing institutional plan	0	3	The project concluded with suggestions on the system and plans to promote EV-RE integration to the decision-makers of relevant government departments. In August 2018, the teamundertook the interim measures on the management of funds for the commercialization and promotion project of comprehensive application of new energy vehicles and renewable energy in China. In August 2018, the management measure on the project of "commercialization and"

					promotion of comprehensive application of new energy vehicles and renewable energy in China" was is sued.
Component 2 – Governme	ent Institutional Capacit	ty Building	g		
Outcome 2: Increased instit Grid) - RE systems	tutional capabilities and a	wareness	of policymake	rsat national and loca	Hevels on the use of integrated EV - SG (Smart
Output 2.1: Training program for 100 city-level policy makers on EV-RE integration policies and demonstration experience	Number of government officials attending EV-RE integration training program that pass test on mastery of materials given at end of program  Proportion of women among training program attendees	0 Not appl	icable	35%	Rugao demonstration projectfocused on the aspects of promotion and demonstration of new energy vehicles, incentive policies, dissemination and trainings. Three policies: Local policiesto regulate and incentivize systems for renewable energy micro-grids, Local incentive policiesfor car sharing based on new energy vehicles, and Local incentive and implementation policy on smart charging pileswill be conducted. During the reporting period, Rugao New Energy Automobile Industry Association investigated on related policies, technologies and development trends of electric vehicles and charging facilities, micro-grid technology demonstration cases, and the commercialization and infrastructure of electric vehicles in Rugao.  Rugao demonstration project focused on the aspects of promotion and demonstration of new energy vehicles, incentive policies, dissemination and trainings. Three policies: Local policiesto regulate and incentivize systems for renewable energy micro-grids, Local incentive policies for car sharing based on new energy vehicles, and Local incentive and implementation policy on smart charging pileswill be conudcted. During the reporting period, Rugao New Energy Automobile Industry Association investigated on related policies, technologies and development trends of electric vehicles and charging facilities, micro-grid technology demonstration cases, and the commercialization and infrastructure of electric vehicles in Rugao.  Conducted survey of policy on new energy vehicles development at home and abroad, such as the United States, Japan, Germany, China, classified from development planning, technology and energy restrictions, infrastructure support and subsidies, investigated the technology and development trends of domestic new energy vehicles. See APP 5 for more details.  Conducted survey on micro-grids development at home and abroad, such as the United States, Japan, Germany, China. Especially focused on the case study of smart integrated microgrid service project in Lingang New Campusof Shanghai Unive
Output 2.2: Four workshops conducted to	Number of workshops at which strong	0		4	10 workshops of EV-RE policymaking or planning framework

Output 2.3: International forums with participants from central government agencies and EV demonstration cities that disseminate international developments in and plans for EV-RE integration  Output 2.4: Written materials on EV-RE integration strategically disseminated to policy makers  Number of case studies case studies in report on international developmen RE integration  Number of di Chinese gov officials atter or both of the forums on international developmen RE integration  Proportion camong all at the international confirmed to reviewed brim materials in Number of of items in online inform	achieved policy, ading admap of women dees of all by and orkshops	Not applicable	35%	Five workshops of Carbon     Neutralization Roadmap Project     Four workshops of policy making     Three workshops on proposed     regulations for carbon emissions     trading framework
materials on EV-RE integration strategically disseminated to policy makers  Number of of items in online inform (possible include: briefings, in study, dem roadmaps,	country included tsin EV- con stinct ernment ading one et wo termational tsin EV- con of women tendees of	0 0 Not applicable	5 30 35%	In 2020, the project team held the International Forum on the Integrated Development Of New Energy Vehicles and Renewable Energy in Shanghai. The representatives of task leader reported the results, and the leaders of the United Nations Industrial Development Organization and local leaders in Shanghai attended and delivered speeches.  In 2021, the project team held another international forum about the China New Energy and Renewable Energy Integration Development on the FCVC2021 in Shanghai, and the representatives of task leaders reported the results and progress before the conclusion of project.
	categories categories categories categories categories categories policy ternational o reports, policies	0	30 6	PMO and all subcontractors prepared brief documents on key EV-RE integration topics for high-level and mid-level government officials during the research on policies and regulations. This includes:  1. The Research Report on the management measures for the secondary-hand use of power batteries of new energy vehicles and the management measures for the secondary-hand use of retired batteries of new energy vehicles have been completed to support MIIT who issued a draft for comments.  2. Automotive Data of China Co., Ltd completed and submitted Management Specifications for Recycling of Vehicle Power Batteries, Part 1 Packaging and Transportation Specifications, Part 2 Disassembly Requirements for Recycling of Vehicle Power Batteries.  3. In March 2020, the project research results "Technical Guidelines for Orderly Charging of Electric Vehicles and Participation in Demand Management" and "Research on Orderly Charging and Demand Side Mechanism Strategy" were quoted and released by Shanghai municipal government.  The project management office prepared the introduction of the EV-RE integration project and reported it to the China Association for Science and Technology. The brief file was sent to the associations for science and technology in all provinces, cities around China. In other words, the brief file could be read by over 100 policymakers in the government.

Outcome 3: Two city-scale   large-scale EV-RE integrati		rating the integration of	EVsand RE, aswell as	s other foundational workneeded to achieve
Output 3.1: Demonstration of integration of EVs with the micro grid in Shanghai and Yancheng	Demonstration on integration of EVs with micro-grid	0	Smart charging systems build	<ul> <li>By October 2021, the smart charging system of Shanghai demonstration project has applied new technologies such as orderly charging and V2G, and the commercialization of smart charging system in business parks, buildings etc. They also built 75 smart charging system demonstration sites and 876 smart charging piles.</li> <li>The Qingdao project built 1071 charging piles serving more than 700 electric vehicles (Specific number: 50 taxis, 50 official vehicles and 600 private or rental vehicles).</li> </ul>
Output 3.2: Demonstration of technologies in Shanghai, Rugao and Yancheng	Number of demonstration projects of technologies	0	4 demonstration in selected cities	Shanghai: The project has completed a technical and economic feasibility demonstration of electric vehicle microgrid, which was a key contribution to EV-RE integration. For micro-grid PV storage-charging demonstration, they constructed 11 sites, covering scenarios including big factory, office building, business parks, university, villages, and industrial zones. For V2G technology display and commercial system demonstration, time-of-use (TOU) charging and V2G demonstration was carried out with SGCC Electric Vehicle Service Co., Ltd. and Mitsubishi Electric, and 20 V2G charging piles and 31 V2G vehicles were deployed in the Project.  Qingdao: Qingdao has built 300 smart charging piles with V2G function, serving at least 300 electric vehicles to promote the business model.
Output 3.3: Demontrations of business models to scale-up the number of Evs in Shanghai		0	3 demonstrations in selected cities	EV time-sharing renting services in Shanghai: By the end of November 2021, a total of 8,000 vehicles were put into operation, 250 time-sharing renting sites and 1,000 charging piles had been built, benefiting over 2.6 million registered members.      Electric bus rental fleets in Shanghai (Shanghai E-drive Company): This project explored the business models of custom new-energy e-buses and ways of commercialization of new-energy e-buses through the customization of company shuttle buses and special lines for its members. By the end of October 2021, the rental e-busfleet (E-drive) in Shanghai had 1,084 buses (including 250 e-buses for custom bus business), 64 charging stations, more than 170,000 mobile APP users, 35 special lines opened and in operation, and more than 23 partner zones.
Output 3.4: Demonstration of energy management centers that collect and manage data on dispersed	ICT management center operational	(0	Establishment of energy management center to collect data	<ul> <li>Shanghai's energy management center was built. By October 2021, a total of 16 demonstration sites in Shanghai had been connected to</li> </ul>

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EVs and retired EV battery packs used as storage for the grid, so that the charge and discharge of these devices can be managed				thisplatform, including 11 PV storage-charging projects and 716 charging piles.  The project has developed and established an energy management system in Qingdao. By the end of 2021, a total of 70 charging stations and 1049 charging piles had been connected, including 10 V2G charging piles, with energy storage capacity of 981KW and photovoltaic capacity of 12.1MW.
Output 3.5: Detailed monitoring and evaluation of all project demo performance, providing insights to city planners for developing EV-RE demonstration plans for their cities	Reports on project demos of power grids, micro-grids, retired batteries and scale up of EV fleet and charging infrastructure	0	Monitoring and assessment of project demos available	Ongoing
Component 4: Awareness	Raising and Dissemina	ation amongst Manufa	cturers, Suppliers, an	d Consumers
Outcome 4: Increased kno development, manufactur	ow ledge and capacity of e, operation, and maint	f business and consur enance with regard to	ner stakeholders, fac EV-RE integration	ilitating awareness, research and
Output 4.1: Dissemination of knowledge amongst industry players (vehicle manufacturers, charging equipment providers, power industry, and other relevant sectors) regarding EV-RE integration  Forums for industry, including both domestic and international players active in the China market in the vehicle, power, and other related sectors, on EV-RE business models, technology, and demonstration results  Dissemination to industry of project's EV-RE information base Meetings publicizing EV-RE related technical standards, held for vehicle OEMs, charging equipment suppliers, and other related industrial companies  Technical operation and maintenance workshops related to EV-RE integration aspects held for relevant industrial organizations  Establishment of industry alliance or association subcommittee for promoting and advancing EV-RE integration and liaising with government on EV-RE integration policy	end of meeting test to confirm acceptable grasp of materials presented  Proportion of attendees at standards meetings that are women	Not applicable 0 Not applicable 0 Not applicable 0	35% 10 60 35% 50	SAE China conducts many workshops on topics related to RE_EV integration, business models and technical standards. The meetings serve both for awareness raising and also bring inputs into the outputs under Outcome 1  Other activities include the following:  On 15 September 2020, the "NEV and Renewable Energy Integrated Development Forum" was held in Shanghai Auto Exhibition Center and was viewed online by 3,800+people, which shows that the project has a certain influence. China SAE has set up Chinese website (http://gef.sae-china.org/), which is updated periodically on basic information, news, and latest research. The website has successfully promoted EV-RE integration of the products and service to auto industries, charging station industries and auto organizations. China SAE has completed the design and distribution of project brochures, and is now entering to the promotion stage by printing out paperwork of many international conferences, including WNEVC2021. On November 4-5 in 2020, the group standard meeting of "Fire Safety for Secondary Utilization of Power Batteries" and "Power Batteries" and "Power Batteries" and "Power Batteries" and china Fire Safety Association, and wasled by Shanghai Fire Safety Research Institute.
liaising with government on	•			Association, and wasled by Shanghai Fire Safety Research
	companies that join the			Project is 43, among which 22 are

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	industry alliance set up by the project to advance EV-RE integration			females (51.2%). The proportion of females in the team is quite high and these females were quite active in the whole project implementation process. The need to tap into the role of those women who work on the land of green and intelligent energy development and explore the value and power of women in the field of NEVs and renewable energy are also important inspirations for the project.  • A forum was held during the 6th International Hydrogen Fuel Cell Vehicle Congress on the strategies of energy technology and transportation industry under the "2060 goal" of national carbon peak carbon neutralization. People paid attention to the development direction of new energy vehicles and smart energy in China and abroad, explores the development mode of green transportation, new energy vehicles, smart energy and V2G integration, and focused on the development trend, technical route and Demonstration application, etc. The on-site delegates included more than 80 from over 50 companies.  • In September 2021, PMO cooperated with the Secretariat of the World New Energy Vehicle Conference to hold a forum on the application practice of the integration of new energy vehicles and renewable energy in China, with more than 250 on-site delegates. Several subcontractors involved in the EV-RE project participated in the event and delivered speeches. The forum focused on the typical demonstration cases of VGI (vehide grid integration) in China, the United States and Japan, summarized and analyzed the key technologies, standard system, supporting foundation of industrial chain, market mechanism and policy coordination strategy required for the large-scale application of VGI, and discussed the development mode and technical route of VGI commercialization.
Output 4.2: Awareness raised among current and future potential car sharing companies of various car sharing business models and integration of EVs with RE in car sharing businesses	project exchange workshop	0	15	In order to promote the knowledge on EV-RE integration among car sharing industry, the international forum for electric vehicle demonstration cities of the International Smart Shared Mobility Congress was held annually in Huadu, Guangzhou, with international seminars on the promotion of the world electric vehicle demonstration city project, sharing travel, automatic driving, and other technological and business model innovation. The forum gathered representatives from more than 20 enterprises and international organizations. Because of COVID-19 restriction in 2021, SMC was put off many times and the conference had been to change offline conference to online, which attached more than 2,000 consumers online and offline.

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EV-RE integration to the general public by various methods to raise awareness of and interest in EV-RE integration as a means of realizing the true environmental potential of EVs  Media promotion of EV-RE integration, raising awareness of the public regarding the need to incorporate RE into EV development to realize the environmental potential of EVs and educating the public on various aspects of EV-RE integration  Promotion of EV-RE integration  Promotion of EV-RE integrations, increasing consumers' understanding of and attraction to the concept and related opportunities  Outreach on social media platforms and cooperation with social media companies to carry out promotion of EV-RE integration	online news) in Chinese press on EV- RE integration	0 0 0 0 0 0 organizations 0 women 0	30 1 million 3 200 (=100 in Yancheng and 100 in Shanghai) 500 8 organizations 400 women 3 2	China SAE has completed the promotional video of GEF6, which is available online. The video introduces the contents of GEF6 from different aspects and shows audience the activities and demonstration in this project since 2018.  The project management office has set up its Chinese official website and official account in Wechat to update and disseminate the latest progress. By the end of September in 2020, with the help of the project management office, more than a hundred media have made report on the achievements of the project within 2 years  During this reporting period, in addition to relevant pushed articles of WeChat official account of Shanghai International Automobile City related to NEVs and renewable energy, relevant units and media also publicized the projects from time to time.
integration demonstration	Number of Chinese government officials that have visited EV- RE integration	0	200	PMO negotiated with China New Energy Ecological Science and Technology Museum which is located in Qingdao, to help to disseminated the EV-RE project as an

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on the topic of EV-RE integration amongst consumers, companies using EVs, and industries related to RE or EV	demonstration center in Yancheng Total number of persons that have visited EV-RE integration demonstration center in Yancheng	0	2,000	exhibition center. By using the onsite rollup banner, customers, policymakers and students could have a chance to know about the NEV and RE. Meanwhile, the development progress of charging and discharging of new energy vehicles and the operation of V2G and Microgrid could be explored in the museum as well. In May 2021, during the first China Charging Facility Technology Innovation Conference, more than 300 delegates including policymakers, engineers, experts gathered in Qingdao and had a chance to take visit in the exhibition center.
Component 5: Monitoring	and Evaluation (M&E)			
Outcome 5: A robust mec	hanism for M&E in plac	e to ensure the attainn	nent of project outco	mes
Output 5.1: Project monitoring plan refined and executed  Output 5.2: Data and information collected to measure certain of the project's outcome and output level indicators, as well as indicators for project's Environmental and Social Management Plan (ESMP)  Output 5.3: Project midterm review and terminal evaluation conducted  Output 5.4: Recommendations and agreed upon action plan for long term project sustainability as part of follow-up to terminal evaluation		Adequate monitoring and evaluation mechanisms are in place, facilitating smooth and successful project implementation and sound impact	Regular monitoring exercises conducted PIRs prepared, tracking tools according to the GEF requirements prepared.  Final project evaluation conducted	Mid-Term review was completed     Project steering committee     meetings conducted and     documented     Progress monitoring reports     prepared     Terminal evaluation has begun

# III. Project Risk Management

**1.** Please indicate the <u>overall project-level risks and the related risk management measures</u>: (i) as identified in the CEO Endorsement document, and (ii) progress to-date. Please expand the table as needed.

	(i) Risks	(i) Risk level	(i) Mitigation measures	(ii) Progress to-date	New defined risk <sup>5</sup>
1	Project progress is much too slow to achieve targets by end of project's three years		Project design includes a timeline with chronological targets. Further, project M&E design calls for four levels of monitoring. At the lowest level, there will be a PMO team member responsible for monitoring. In addition to day-to-day monitoring, the team	The signature of the agreements required to initiate the project execution took one year, which delayed the start of the project implementation. However, the project picked up and completed all activities, with the	

<sup>&</sup>lt;sup>5</sup> New risk added in reporting period. Check only if applicable.

			member will prepare quarterly project reports and monitor project indicators, with an update on indicators every six months. At the next level, the full project team will discuss progress on indicators at least twice per year. At the highest level, project progress will be monitored by the Project Steering Committee, which will meet periodically, preferably two times per year. In addition, UNIDO, in its role as GEF Implementing Agency, will monitor the timeliness of project work.	exception of the terminal evaluation, in spite of COVID lockdowns during FY20. The project has been extended in FY22 to accommodate the terminal evaluation in light of COVID lockdowns in the past year.	
2	Pilots become too simplified and/or too small scale to provide convincing and useful evidence to the central government and potential replication cities regarding the viability of and value of EV-RE integration	L	During the design phase, very detailed pilot descriptions have been prepared for both the Yancheng and Shanghai pilots. These descriptions specify the scale and constituents of each type of demo, whether it is smart charging with the main grid or micro-grid EV charging incorporating a certain number of retired EV battery packs. These detailed pilot descriptions have been prepared based on input directly provided by the pilot coordinating organizations, Yancheng Economic and Technological Development Zone Management Agency and Shanghai International Automobile City. It is expected that the level of this detail in project pilot design will prevent the pilots from becoming too simplified or too small-scale to provide convincing and useful evidence to stakeholders.	demonstration sites from Yancheng to Qingdao (with the exception of the RE micro-grid demonstration using wind power).	
3	Cooperation from State Grid and subsidiary grid companies to reduce wind power curtailment in Yancheng based on introduction of	M	The PPG phase has involved State Grid personnel in project design. During project implementation, State Grid and relevant local gird personnel will be proactively included in various capacity building efforts to build their engagement with	lead implementation department for Yancheng,	

	smart charging for 1,000 vehicles is not obtained. Further, cooperation from State Grid on energy management center exchange of information between the grid, vehicles, and charging poles is not obtained.		and buy-in for EV-RE integration concepts and plans.	and MIIT approval, proposed to switch demonstration to Qingdao, with Qingdao Telaidian New Energy Co., Ltd as the execution partner for the pilots.	
4	EV-RE integration related policy and roadmap recommendations of the project not adopted by policy makers	M	Project design involves a high level of consultation with government stakeholders in the design of the national EV-RE integration roadmap and in the drafting of policies related to such integration. As a part of Component 1, focused one-onone meetings to discuss proposed policies and the roadmap will be held with relevant government organizations. As a part of Component 2, government officials will be involved in workshops/ large group discussions to revise and build consensus on the same. Finally, the project will frequently make stakeholders aware of the overall importance and urgency of integrating EV with RE. It will make stakeholders aware that if EVs in China are to truly realize their environmental potential and thus make the substantial effort to promote EVs in China to date worthwhile, EV-RE integration is needed.	players.	
5	Industry and service sectors do not see potential in EV-RE integration and thus do not get involved in providing the	L	In China, businesses have a strong tendency to respond with enthusiasm to those new industries that they see the government promoting with policy. Thus, the project's emphasis on policy and planning initiatives should also serve to stimulate interest from	The involvement of key players in EV-RE integration, like SAE China and Shanghai Automotive City and city level industrial development authorities, ensure the involvement of key industries. The strong legislation in China also	

	products and services needed		businesses. In addition, the project, in its fourth component, includes specific capacity building related to EV-RE integration for relevant industry and service sectors.	continues to drive the market players.	
6	Other cities not interested in replicating EV-RE integration pilots	L	The strong efforts that many cities have put into promoting EVs under the central government's EV promotion program is evidence that many cities are likely to similarly pick up EV-RE integration efforts if these are promoted by the central government. In addition, the project's capacity building program for 100 local government officials is likely to raise their enthusiasm as it guides them in developing EV-RE integration plans for their cities.	Considering the Government drive and targets in place in China, the adoption of electric vehicles and other forms of electric transport.	
7	Relevant central government organizations not willing to coordinate with each other on EV-RE integration	L	The project will address the need for inter-ministerial coordination to realize EV-RE integration in China by developing a plan for such institutional coordination. Chinese government organizations have a history of cooperating on other issues by cross-department working groups, so such cooperation should be possible once a mandate for it is developed.	Inter-Ministerial and governmental coordination mostly on track. MTR has highlighted opportunity to further engage MEE and NDRC in PSC.	
8	Press not interested in covering the topic of EV-RE integration	L	Project design calls for specific activities for outreach to the press. In the past, the Chinese press has been receptive to topics involving new technologies and the auto industry, as well as topics involving the environment.	Feature articles on various media and good coverage on TV particularly of events.	
9	China's EV market stagnates in the future as subsidies and other incentives are reduced, so that EV-RE integration cannot be	L	Increased charging infrastructure for EVs, as promoted by the project, will serve as a counterforce to reduced subsidies. Further, the growth in establishment of EV car sharing businesses in city centers will serve both to increase EV numbers directly	The shift from fiscal incentives to other market incentives is being carefully planned.	

	achieved on a large scale in the nation		and to raise awareness of EVs among consumers. Finally, the Chinese Government carefully monitors the EV market and is adjusting its policy for incentive phase out accordingly, so as not to have an overly negative impact on growth of the EV market.		
10	Social/ gender risk: Very few women are involved in the project, so that the project serves to reinforce the gender gap rather than reduce it	L	The project has adopted specific measures to ensure the project is a positive force in reducing the gender gap.  These include ensuring that women make up 35 percent of trainees and /or participants at various capacity building events and workshops. They also include outreach to women's groups about EV-RE integration. Project management, in addition, will strive to ensure that 35 percent of the project's domestic and international consultant days, respectively, are performed by women.	The involvement of women trainees and also leadership especially in organizations like SAE China and Shanghai Automotive City is considerable. For example, the total number of participants involved in the Shanghai Demonstration Project is 43, among which 22 are females (51.2%).	
11	Vulnerability to climate events	L	The type of interventions to be undertaken in this project (standards and technology integration) has negligible wherability to climatic events. Climate considerations will be made when selecting locations for installing charging equipment	Not relevant	

**2.** If the project received a <u>sub-optimal risk rating (H, S)</u> in the previous reporting period, please state the <u>actions taken</u> since then to mitigate the relevant risks and improve the related risk rating. Please also elaborate on reasons that may have impeded any of the sub-optimal risk ratings from improving in the current reporting cycle; please indicate actions planned for the next reporting cycle to remediate this.

Not applicable		

3. Please indicate any implication of the COVID-19 pandemic on the progress of the project.

Project implementation at the sub-project level experienced delays due to COVID-19 pandemic situation. This has included project contract companies working from home, postponement of planned meetings and events, and delays in the delivery and installation of equipment for demonstration projects. Restrictions on

air-travel also had placed limitations on physical visits to pilot cities for data collection and meetings with key stakeholders.

Despite these challenges, the project has been able to complete activities with the exception of the Terminal Evaluation. Due to COVID-19 health and travel restrictions, two extensions have been requested in response to national circumstances and to ensure that the evaluators are able to complete the evaluation, specifically by being able to visit the demonstration sites, of which this project has a considerable quantity of. There is a moderate risk that COVID-19 could continue to impact the project's ability to complete all necessary activities required as part of the Terminal Evaluation. The project team continues to monitor the situation and communicate with the terminal evaluation team.

4. Please clarify if the project is facing delays and is expected to request an extension.

The project requested an extension during the reporting period to allow for sufficient time to complete the terminal evaluation. Progress on the terminal evaluation has been limited to online interviews as COVID-19 related travel restrictions and safety measures have prevented the evaluation team from being able to complete demonstration site visits. The project at this time is not anticipating an additional extension that will be required and is regularly monitoring the situation and in communication with the terminal evaluation team.

**5.** Please provide the **main findings and recommendations of completed MTR**, and elaborate on any actions taken towards the recommendations included in the report.

Summary of findings	by evaluation	criteria for MTR.

Criterion	Summarized finding	Section	Rating <sup>6</sup>	
A. Project Desig	A. Project Design Assessment			
Project Design	The project design is seen as sound and appropriate, technically feasible and able to address the problems at hand. The project's financial, institutional and implementation arrangements are reasonable and make the best use of limited resources. The M&E plan has been established. However, the failure to adequately assess the risks during the project design phase led to a delay in the implementation of the Yancheng demo.	3.1.1	S	
Project Results Framework / Logframe	The project's result-chain is clear and logical. It provides good support for activities development, sub-contracting and M&E.	3.1.2	HS	
B. Project Perfor	B. Project Performance and Progress Towards Results			
Relevance	The project is highly relevant for national development priorities, the intended beneficiaries, and implementing partners. It is fully pertinent to UNIDO's mandate and	3.2.1	HS	

<sup>&</sup>lt;sup>6</sup> Identified using this categorisation:

Rating scale for project performance:

Highly Satisfactory (HS): Level of achievement clearly exceeds targets and expectations; there are no shortcomings Satisfactory (S): Level of achievement meets expectations (i.e. 80-95%); there are no or only minor shortcomings Moderately Satisfactory (MS): Level of achievement more or less meets expectations (i.e. 60-80%); there are some shortcomings

Moderately Unsatisfactory (MU): Level of achievement is somewhat lower than expected (i.e. 60%) and there are significant shortcomings

Unsatisfactory (U): Level of achievement is substantially lower than expected and there are major shortcomings Highly Unsatisfactory (HU): Level of achievement is negligible and there are severe shortcomings Rating scale used to assess sustainability:

HL: Highly Likely L: Likely ML: Moderately Likely MU: Moderately Unlikely U: Unlikely HU: Highly Unlikely

	domains of comparative advantage and fully aligned with the donor's focal area priorities with respect to climate change mitigation.			
Effectiveness and Progress Towards Expected Results	Most of the activities wents moothly as planned, and achieved the expected results, especially Shanghai demo. However, the activities of Yancheng demo are stagnant. The project implementation should be speeded up in the future, especially the Qingdao demo, so as to ensure that the subsequent activities related to the dissemination of the pilot experience can be carried out on schedule.	3.2.2	S	
Efficiency	The project has gained efficiencies in good project management, strategic use of funds and co-financing. Regarding the funding: the GEF fund was generally used as planned, and has achieved a good leveraging effect. Regarding the timing: the project deadline is expected to be extended to March 2022. The stagnation of Yancheng demo led to time inefficiency. In addition, some meetings and trainings were re-organized in implementation, which effectively improved the efficiency of the project.	3.2.3	S	
Gender Mainstreaming	There were many gender-related indicators in the results framework. Women played a key role in the project. Some of the activities were carried out with active participation of women such as electric bus rental demo. Although a large number of gender-related indicators were designed in the results framework, the details of them were not described in the PIRs.	3.2.4	S	
Sustainability	The project's objective of reducing carbon emissions and addressing climate change is highly consistent with national and global development strategies. During the project implementation, some policy documents related to EV-RE integration have been formed and released, which will also play a positive role in the further promotion of the project results.  The strengthening of national policy generally means an increase in government funding support. The subsidy policies for EV and RE will continue. In addition, pilot studies have also been conducted for the business model of EV-RE integration. Some of the demonstrations have already or are expected to achieve good economic benefits to support the further sustainability of the project outputs.  After the project, activities related to EV-RE integration will mainly rely on governments and market players. The project has got a good effect on the cultivation of the market. The technical and policy elements required to support the continuation and replication of the project have been basically formed, and some of the relevant training and promotion activities have been carried out.  The project is conducive to reducing carbon emissions, which has a positive impact on the ecological environment in China and the world, with no adverse environmental impacts likely to affect the sustainability of benefits.	3.2.5	HL	
C. Project Imple Project	mentation Management National PSC and PMO have been established. In demo cities,	3.3 3.3.1	S	
Management	local PSC, PMO and expert committee have also been setup. Communication between the stakeholders is smooth and transparent, and most of partners can complete the assigned tasks in a timely and effective manner. The PSC meetings are held regularly. There have been personnel changes in some agencies. Most of the changes have not affected project implementation, except for the Yancheng demo. SAE-China			

	communicated with UNIDO and GEF in time and solved the		
	problem, significantly reducing the negative impact.		
Results-Based	The project's results framework was used as a management	3.3.2	S
Work Planning,	tool to guide development of work plans and to regularly	3.3.2	
M & E,	monitor and report on results. There are project plans in the		
Reporting	contract and PIRs. The project consumed more time at start-		
Reporting	up, and the activities can be carried out as planned. An		
	effective M&Eplan is in place and appropriate funding is		
	allocated to it. The project execution agency submitted		
	biannual and annual PIRs on time, but the reports do not		
	provide sufficient information on some of the KPI indicators.	2.2.2	~
Financial	GEF allocated project funds timely as planned, and the funds	3.3.3	S
Management	were used in accordance with the terms and conditions of		
and Co-	UNIDO, MOF, and the project management approach. Co-		
Financing	financing provided has reached 82% (see Annex 4) and were		
	used as planned. The projects in Shanghai were subsidized		
	after implementation, which guaranteed the projects quality,		
	but also resulted in a lower funding utilization rate (The sub-		
	contractors can only get about 30% of the expected funding		
	support after the project is recruited and reviewed from		
	SIAC).		
Stakeholder	Government stakeholders support project objectives and have	3.3.4	HS
Engagement	an active role in decision-making through their engagement as		
and	implementing partners. The external communication		
Communication	mechanism of this project is well established, with an		
	adequate budget, and has effectively promoted public		
	awareness through holding large-scale meetings, establishing		
	a publicity website, etc. The internal communication		
	mechanismis smooth, and when problems arose, the project		
	activities can be adjusted in time.		
D. Performance		3.4	
UNIDO	UNIDO's involvement is highly valued for its contribution of	3.4.1	HS
	technical expertise, networks, thought leadership, and		
	ultimate responsibility for the project, as GEF's implementing		
	agency. The project manager of UNIDO has strong		
	organization and coordination skills.		
National	Relevant national ministries such as MIIT and MOF have	3.4.2	S
Counterparts	been engaged as PSC members, fostering national ownership,	0	
Counterparts	assuring their influence on the project's efficient and effective		
	implementation, and facilitating inter-departmental		
	coordination. However, the main departments related to		
	climate change in China such as MEE and NDRC were not		
	involved in the project. SAE-China organized the activities		
Danas	and communicated with stakeholders in a timely manner.	2.4.2	TIC
Donor	As a donor organization, GEF readily approved the project	3.4.3	HS
	design upon its initial submission, disbursed project funds in a		
	timely manner.		

# Summary of recommendations and actions taken

Recommendations	Action Taken
1. It is suggested that MEE and NDRC are included into the PSC. The benefits of the project in the field of energy and environment should be summarized. Besides, the projects can try to attract more people	presented at the last PSC meeting. The inclusion of MEE and NDRC for the PMC and this project and including them in future projects that are similar in nature has been noted.

from relevant fields like energy and environment to participate in.	
2. The demonstration scale is limited, and should be strengthened. The PMO should have full-time staff concentrating on this project, and strengthen the tracking of KPI indicators, such as carbon emission reduction and women's participation. These indicators should also be described in detail in the PIRs according to the results framework.	• Effort has been directed to strengthening the demonstrations in line with completing the project in time. Challenges related to collecting KPIs have been noted and UNIDO has taken steps to improving this in the design and development of new electric mobility projects as part of GEF-7.
3. The evaluator believes that the project can be completed within the deadline. However, further risk assessments need to be conducted, and the project plan should be appropriately adjusted based on the assessment results, so as to ensure the successful completion of the project objectives.	The project plan was adjusted with consideration for risks and managed to complete activities, with the exception of the terminal evaluation requiring an extension due to COVID-19 restrictions.
4. Speed up the process of demonstration work, especially accelerate the implementation of Qingdao demo. SAE-China and UNIDO should supervise the project implementation in a timely manner. Shanghai demo should promote the data connection of the Energy Management Center.	The project was able to successfully accelerate implementation and complete the demonstration in Qingdao per the original timeline.

# IV. Environmental and Social Safeguards (ESS)

UN	As part of the requirements for <b>projects from GEF-6 onwards</b> , and based on the screening as per the IDO Environmental and Social Safeguards Policies and Procedures (ESSPP), which category is the ject?
	Category A project
$\boxtimes$	Category B project
	Category C project
(Ву	selecting Category C, I confirm that the E&S risks of the project have not escalated to Category A or B).

	E&S risk	Mitigation measures undertaken during the reporting period	Monitoring methods and procedures used in the reporting period
(i) Risks identified in ESMP at time of CEO Endorsement	The ESMP outlines 42 individual environmental / social risks. Broadly, the risks can be grouped into the following:  Policy not being adopted by counterparts;  Policy and regulatory measures are not effective;  Risk of capacity building being conducted ineffectively;  Risk of incentives being poorly designed;  Risk of new standards being coherent with existing standards;  Risk of pilot demonstrations not being completed efficiently or effectively; and  Lack of local expertise to completed demonstrations.	Mitigation measures during the reporting period include the following:  • Engagement of key stakeholders in policy development to encourage policy coherence and policy adoption;  • Demonstration sites in Yancheng being changed to Qingdao to address challenges in stakeholder ownerships that were a potential risk to effective implementation of demonstration; and  • Capacity building targeting key constituents necessary for project's success; and	Complete monitoring methods and procedures established and will be expanded on in due course.
(ii) New risks identified during project implementation (if not applicable, please insert 'NA' in each box)			

## V. Stakeholder Engagement

1. Using the previous reporting period as a basis, please provide information on **progress**, **challenges** and **outcomes** regarding engagement of stakeholders in the project (based on the Stakeholder Engagement Plan or equivalent document submitted at CEO Endorsement/Approval).

The project is being nationally executed by SAE China. For the purpose of mainstreaming the project execution and implementation and to comply with the requirements of the Government of China, UNIDO signed three level of agreements, an implementation agreement with the Ministry of Finance as the GEF focal point, an execution agreement with the Ministry of Industry and Trade as the national agency responsible for the oversight of the national execution and a project level agreement with SAE China.

A project management unit is set up at the SAE China and a project steering committee with representation from all national stakeholders is established.

The coordination between the stakeholders has continued to prove effective. This has been demonstrated by the speed at which the project has been able to implement final activities in the previous year, in spite of some challenges in the previous reporting period related to COVID-19. Recent development in 2022 related to COVID-19 pandemic have unfortunately prevented the project from having closing events to highlight the achievements and outcomes of the projects with stakeholders. A final milestone for this will be the presentation of the terminal evaluation to stakeholders once it is completed during the next reporting period.

**2.** Please provide any feedback submitted by national counterparts, GEF OFP, co-financiers, and other partners/stakeholders of the project (e.g. private sector, CSOs, NGOs, etc.).

Through the established mechanism of the project steering committee, the national stakeholders provide feedback to the project executing partner. Furthermore, the national events planned under the communication and awareness raising are always well attended by the national and international partners.

Feedback from stakeholders of the project has also been incorporated into the project's Final Report, submitted by the Society of Automotive Engineers in China as the execution agency and included as an attachment. Additional stakeholder engagement and feedback collected during this period will be included in the terminal evaluation and provided once completed.

No further separate feedback was received.

- 3. Please provide any relevant stakeholder consultation documents.
  - Project Final Report.

#### VI. Gender Mainstreaming

1. Using the previous reporting period as a basis, please report on the **progress** achieved **on implementing gender-responsive measures** and **using gender-sensitive indicators**, as documented at CEO Endorsement/Approval (in the project results framework, gender action plan or equivalent),.

Efforts are made to continuously mainstream gender in the project activities. The project commits to gender sensitive policies as well as active engagement of women and sex disaggregated targets. The PMU at SAE China is led by women. Furthermore, in the carrying out of events, UNIDO advocates to the extent possible on the equal representation in panels and training workshops.

The total number of participants involved in Shanghai Demonstration Project is 43, among which 22 are females (51.2%). The proportion of females in the team is quite high and these females were quite active in the whole project implementation process.

## VII. Knowledge Management

1. Using the previous reporting period as a basis, please elaborate on any **knowledge management activities** / **products**, as documented at CEO Endorsement / Approval.

In September 2021, PMO cooperated with the Secretariat of the World New Energy Vehicle Conference to hold a forum on the application practice of the integration of new energy vehicles and renewable energy in China, with more than 250 on-site delegates. Several subcontractors involved in the EV-RE project participated in the event and delivered speeches. The forum focused on the typical demonstration cases of VGI (vehicle grid integration) in China, the United States and Japan, summarized and analyzed the key technologies, standard system, supporting foundation of industrial chain, market mechanism and policy coordination strategy required for the large-scale application of VGI, and discussed the development mode and technical route of VGI commercialization. Jiangkou Qingzheng, director and general manager of Mitsubishi Electric Power electromechanical equipment (Beijing) Co., Ltd., shared the situation of Mitsubishi Electric Group V2X in Japan.

The website of project has already been established. By the end of 2021, more than 40 relevant project news trends and 10 project subject reports have been released, promoted and publicized in the industry through e-mail and international forums. The website covers key demonstration projects during the implementation period, such as Shanghai demonstration project and Qingdao demonstration project, technical cases of demonstration projects in China (i.e. Baoding V2G Great Wall Industrial Park project and Yancheng renewable energy microgrid project), reports, real time news, information of international forums held for the project, etc.

2. Please list any relevant knowledge management mechanisms / tools that the project has generated.

China SAE has set up Chinese website (<a href="http://gef.sae-china.org/">http://gef.sae-china.org/</a>), which is updated periodically on basic information, news, and latest research. The website has successfully promoted EV-RE integration of the products and service to auto industries, charging station industries and auto organizations.

The project management office has also set up its Chinese official website and official account in Wechat to update and disseminate the latest progress.

## VIII. Implementation progress

1. Using the previous reporting period as a basis, please provide information on **progress, challenges and outcomes achieved/observed** with regards to project implementation.

#### PROGRESS AND OUTCOMES ACHIEVED:

## Output 1.1

In November 2021, the Energy Research Institute of the National Development and Reform Commission invited representatives from the national energy administration, China Electric Power Enterprise Federation, the State Grid Corporation of China and some domestic electric vehicle enterprises to discuss the participation of electric vehicles in the operation of power system, improving the role of flexible charging resources of electric vehicles and consuming renewable energy.

By the end of 2021, the research output had contributed to 4 national policies, including as follows:

- 1. New Energy Vehicle Industry Development Plan (2021-2035) released by State Council in November 2020
- 2. Implementation Opinions on Further Improving the Service Guarantee Capacity of Charging And Battery Swapping Infrastructure (Draft for comments) issued by National Development and Reform Commission

and National Energy Administration (power department)

- 3. Guidance on Accelerating the Development of New Energy Storage issued by National Development and Reform Commission, national development and Reform Commission and energy administration in July 2021
- 4. Action Plan for Carbon Peak before 2030 by State Council in October 2021

## Output 1.2

By August 2021, four group standards related to fire safety of power battery secondary-hand utilization were completed. The official standards file number includes T/CSAE 214-2021, T/CSAE 215-2021, T/CSAE 216-2021, T/CSAE 217-2021.

State Grid has completed all research by the end of 2021. So far, group standard of Electric Vehicle Charging and Battery Swapping Service Information Exchange-Part 6: Technical Specification for Charging and Battery Swapping Equipment Access To Charging Service Platform, and group standard Electric Vehicle Charging and Battery Swapping Service Information Exchange-Part 9: Functional Specification of Management Information Platform have been officially published. An industry standard "Electric Vehicle Charging and Discharging Two-way Interaction-Part 1: General Principles" was developed and submitted to China Electricity Council. By taking suggestions from more than 20 experts from electric power companies, charging operators, automobile enterprises, the standard is predicted to public in May 2022. Besides, the national standard of information communication protocols between off-board conductive charger and battery management system of electric vehicle has completed public solicitation, which would be released in 2022 as planned.

#### Output 1.3

From November 2020 to December 2021, the carbon neutralization roadmap project involved a series of indepth discussion with MIIT, Ministry of Ecology and Environment, Ministry of Science and Technology, Ministry of Transport, China National Institute of Standardization, based on the preliminary research results and the core framework of the project scheme. Through analyzing the technical development path of passenger vehicle, commercial vehicle, and manufacturer, the research project proposed: "the carbon peak will be achieved in 2028, the carbon emission will decrease by nearly 85% compared with the peak in 2050, and carbon neutralization will be achieved in 2060".

## Output 2.2

On July 28, 2021, the first work meeting of the Action Plan for Low Carbon Travel of New Energy Vehicles was successfully held in Beijing. Hou Fushen, Deputy Secretary General of China SAE and executive president of SAIC Strategy Institute, Wei Zhihong, Professor of Tsinghua University, Wu Bin, director of marketing department of State Grid Co., Ltd., Gong Junsong, deputy general manager of Beijing Green Exchange Co., Ltd., Huang Xueliang, deputy general manager of China Classification Society Quality Certification Co., Ltd., and other leaders attended the working meeting. More than 60 enterprise representatives including travel platform companies, battery and charging enterprises, automobile supporting enterprises and logistics companies attended the meeting.

In November, 2021, the Energy Research Institute of the National Development and Reform Commission invited representatives of the National Energy Administration, China Electric Power Enterprise Federation, the State Grid Corporation of China and domestic electric vehicle enterprises to discuss the role of electric vehicles in the operation of power system in order to improve the flexible charging resources of electric vehicles and consuming renewable energy.

#### Output 3.1

By October 2021, the smart charging system of Shanghai demonstration project has applied new technologies such as orderly charging and V2G, and the commercialization of smart charging system in business parks, buildings, etc. They also built 75 smart charging system demonstration sites and 876 smart charging piles.

The Qingdao project built 1071 charging piles serving more than 700 electric vehicles (Specific number. 50 taxis, 50 official vehicles and 600 private or rental vehicles). The smart charging piles coordinated with the power grid dispatching to realize smart charging and maximize the vehicle charging demand without impacting the power grid.

## Output 3.2

Qingdao has built 300 smart charging piles with V2G function, serving at least 300 electric vehicles to promote the business model. The project undertaking unit collected and analyzed the dynamic data between vehicles and power grid generated in Qingdao smart charging network, and collected smart charging demonstration data of more than 200 hours on average for each charging pile. They also did out cost-benefit analysis on these data with conclusions of 3-5 other types of charging systems built in other cities in order to find out the advantages and disadvantages of each model, and to provide references for policymakers, After the exploration and analysis of various models, the business model of sustainable development was more clarified and an executable business model report was issued.

#### Output 3.3

By the end of October 2021, a total of 124,134 public and exclusive charging facilities in Shanghai had been connected to the Project, including 74,839 public charging piles and 49,325 exclusive charging piles.

With respect to the EV time-sharing renting services in Shanghai (EVCARD), by the end of November 2021, a total of 8,000 vehicles were put into operation, 250 time-sharing renting sites and 1,000 charging piles had been built, benefiting over 2.6 million registered members.

#### Output 3.4

#### Shanghai

The project is committed to creating an energy management platform that can receive, store, monitor, and display data. These functions are capable of gathering real-time data from smart charging piles, energy storage stations – micro-grids, V2G and other energy systems. By October 2021, a total of 16 demonstration sites in Shanghai had been connected to this platform, including 11 PV storage-charging projects and 716 charging piles.

#### Qinqdao

The project has developed and established an energy management system in Qingdao. The smart charging piles and microgrid systems built in this project are all connected to this energy management system to collect data and send control information for electric vehicles participating in smart charging demonstrations and microgrid V2G demonstrations. The collected data includes charge and discharge time, power, current and voltage, order number, operating status, real-time power, SOC value, etc. Although this system is not connected to all the charging infrastructure in Qingdao, it proves that such system is technically feasible for building a municipal energy management system

By the end of 2021, a total of 70 charging stations and 1049 charging piles had been connected, including 10 V2G charging piles, with energy storage capacity of 981KW and photovoltaic capacity of 12.1MW. Total revenue is 105,6812.9 RMB. It indicates the use of city-level platforms to manage urban charging facilities will become an effective means of managing the charging pile industry.

#### Output 4.1

In September 2021, PMO cooperated with the Secretariat of the World New Energy Vehicle Conference to hold a forum on the application practice of the integration of new energy vehicles and renewable energy in China, with more than 250 on-site delegates. Several subcontractors involved in the EV-RE project

participated in the event and delivered speeches. The forum focused on the typical demonstration cases of VGI (vehicle grid integration) in China, the United States and Japan, summarized and analyzed the key technologies, standard system, supporting foundation of industrial chain, market mechanism and policy coordination strategy required for the large-scale application of VGI, and discussed the development mode and technical route of VGI commercialization. Jiangkou Qingzheng, director and general manager of Mitsubishi Electric Power electromechanical equipment (Beijing) Co., Ltd., shared the situation of Mitsubishi Electric Group V2X in Japan.

#### **CHALLENGES:**

During the last reporting phase, the PSC, with UNIDO and MIIT approval, proposed to switch demonstration to Qingdao, with Qingdao Telaidian New Energy Co., Ltd as the execution partner for the pilots. Due to frequent changes in leadership with Yancheng Bureau of Industry and Information Technology, which originally lead the implementation department for Yancheng, enthusiasm for demo was reduced before the demonstration started, which led to the change to Qingdao. For this reporting period, there was pressure for the project to rapidly implement activities in Qingdao in order to complete all project activities. Fortunately, the project team was able to successfully mobilize partners to complete the demonstrations on schedule.

Another challenge has been the completion of the project's terminal evaluation. Two project extensions were requested to permit sufficient time for the completion of the terminal evaluation. The evaluators have been unable to complete the terminal evaluation due to national health and travel restrictions related to the COVID-19 pandemic in 2022 that prevent site visits and local interviews. Given recent improvements in COVID figures, there is optimism that the evaluation will be completed by the end of 2022.

**2.** Please briefly elaborate on any **minor amendments**<sup>7</sup> to the approved project that may have been introduced during the implementation period or indicate as not applicable (NA).

Please tick each category for which a change has occurred and provide a description of the change in the related textbox. You may attach supporting documentation, as appropriate.

	Results Framework	
	Components and Cost	
	Institutional and Implementation Arrangements	
	Financial Management	
×	Implementation Schedule	Two project extensions were requested to permit sufficient time for the completion of the terminal evaluation. The evaluators have been unable to complete the terminal evaluation due to national health and travel restrictions related to the COVID-19 pandemic in 2022 that prevent site visits and local interviews.
	Executing Entity	
	Executing Entity Category	
	Minor Project Objective Change	
	Safeguards	

<sup>&</sup>lt;sup>7</sup> As described in Annex 9 of the *GEF Project and Program Cycle Policy Guidelines*, **minor amendments** are changes to the project design or implementation that do not have significant impact on the project objectives or scope, or an increase of the GEF project financing up to 5%.

	Risk Analysis	
	Increase of GEF Project Financing Up to 5%	
	Co-Financing	
×	Location of Project Activities	Due to frequent changes in leadership with Yancheng Bureau of Industry and Information Technology, lead implementation department for Yancheng, enthusiasm for demo was reduced before demo started. PSC, with UNIDO and MIIT approval, proposed to switch demonstration to Qingdao, with Qingdao Telaidian New Energy Co., Ltd as the execution partner for the pilots.
	Others	

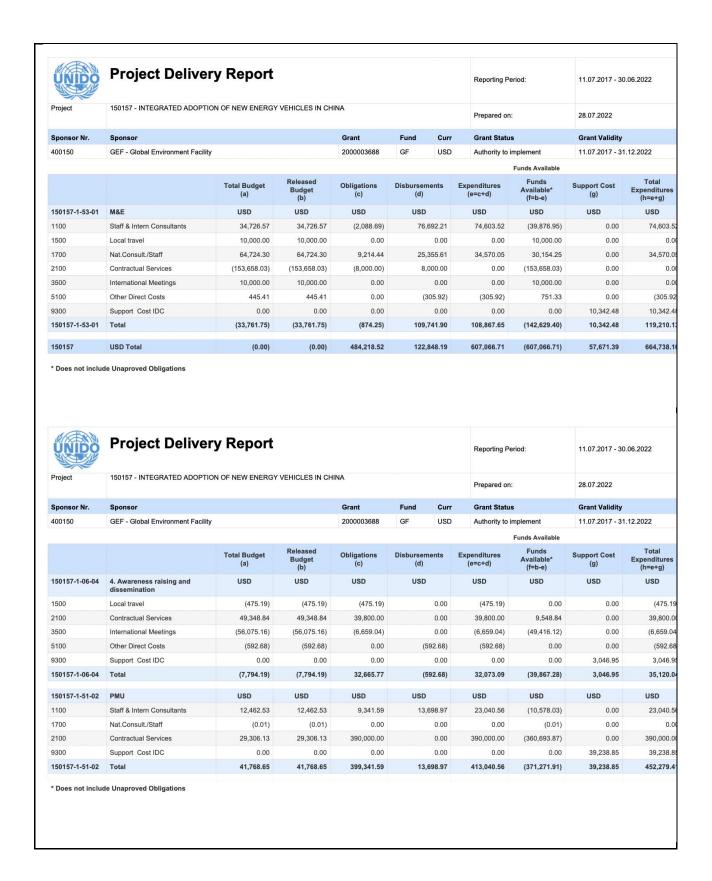
## 3. Please provide progress related to the financial implementation of the project.

The project's national co-financing is a combination of government and private sector funding (cash and in kind). National co-financing allows for country ownership and gains the government's interest in project outputs and outcomes for which their funds are spent.

The co-financing has been mobilized mostly for the investment and technology demonstration of integration of electric vehicle and renewable energy technology under Component 3.

The GEF grant makes a catalytic effect, unlocking investment in EV-RE infrastructure, with consideration for policy development and financial investment that reflects an integrated approach.

UNIDO	Project Delivery Report					Reporting Pe	Reporting Period:		11.07.2017 -		
Project	150157 - INTEGRATED ADOPTION	OF NEW ENERGY VI	EHICLES IN CHINA				Prepared on:	Prepared on:		27.07.2022	
Sponsor Nr.	Sponsor			Grant	Fund (	Curr	Grant Status	s	Grant Validity		
400150	GEF - Global Environment Facility			2000003688	GF (	JSD	Authority to it	mplement	11.07.2017 - 31	12.2022	
								Funda Available			
		Total Budget (a)	Released Budget (b)	Obligations (c)	Disbursements (d)	5 E	Expenditures (e=c+d)	Funds Available* (f=b-e)	Support Cost (g)	Total Expenditures (h=e+g)	
150157-1-06-01	1. Policies and Programmes	USD	USD	USD	USD		USD	USD	USD	USD	
2100	Contractual Services	(79.45)	(79.45)	(98,870.00)	395,920	00	297,050.00	(297,129.45)	0.00	297,050.00	
5100	Other Direct Costs	(14.59)	(14.59)	(14.59)	0.	00	(14.59)	0.00	0.00	(14.59	
9300	Support Cost IDC	0.00	0.00	0.00	0.	00	0.00	0.00	28,218.36	28,218.3	
150157-1-06-01	Total	(94.04)	(94.04)	(98,884.59)	395,920.	.00	297,035.41	(297,129.45)	28,218.36	325,253.7	
150157-1-06-02	2. Institutional Capacity Building	USD	USD	USD	USD		USD	USD	USD	USD	
2100	Contractual Services	(38.49)	(36.49)	(84,730.00)	240,380	00	155,650.00	(155,686.49)	0.00	155,650.0	
5100	Other Direct Costs	0.00	0.00	0.00	0.	00	0.00	0.00	0.00	0.0	
9300	Support Cost IDC	0.00	0.00	0.00	0.	00	0.00	0.00	14,788.75	14,788.7	
150157-1-06-02	Total	(36.49)	(36.49)	(84,730.00)	240,380.	.00	155,650.00	(155,686.49)	14,786.75	170,436.7	
150157-1-06-03	Piloting Technical and commercialized	USD	USD	USD	USD		USD	USD	USD	USD	
2100	Contractual Services	(82.18)	(82.18)	(1,206,042.00)	2,019,192	00	813,150.00	(813,232.18)	0.00	813,150.0	
5100	Other Direct Costs	0.00	0.00	0.00	0.	.00	0.00	0.00	0.00	0.0	
9300	Support Cost IDC	0.00	0.00	0.00	0.	00	0.00	0.00	77,249.25	77,249.2	
150157-1-06-03	Total	(82.18)	(82.18)	(1,206,042.00)	2,019,192	.00	813,150.00	(813,232.18)	77,249.25	890,399.2	



## IX. Work Plan and Budget

1. Please provide an updated project work plan and budget for the remaining duration of the project, as per last approved project extension. Please expand/modify the table as needed.

		20	2022		
Outputs by Project Component	Q1	Q2	Q3	Q4	GEF Grant Budget Available (US\$)
Output 5.3: Project mid-term review and terminal evaluation conducted			94,346.78		94,346.78

# X. Synergies

# 1. **Synergies** achieved:

Lessons learned from this project continue to be shared through UNIDO's electric mobility programme and will be presented and distributed through the GEF-7 Global Programme to support countries with the shift to Electric Mobility.

## 3. Stories to be shared (Optional)

N/A	

#### **EXPLANATORY NOTE**

- 1. **Timing & duration:** Each report covers a twelve-month period, i.e. 1 July 2021 30 June 2022.
- 2. **Responsibility:** The responsibility for preparing the report lies with the project manager in consultation with the Division Chief and Director.
- 3. **Evaluation:** For the report to be used effectively as a tool for annual self-evaluation, project counterparts need to be fully involved. The (main) counterpart can provide any additional information considered essential, including a simple rating of project progress.
- 4. **Results-based management**: The annual project/programme progress reports are required by the RBM programme component focal points to obtain information on outcomes observed.

Global Envi	Global Environmental Objectives (GEOs) / Development Objectives (DOs) ratings							
Highly Satisfactory (HS)	Project is expected to achieve or exceed <u>all</u> its major global environmental objectives, and yield substantial global environmental benefits, without major shortcomings. The project can be presented as "good practice".							
Satisfactory (S)	Project is expected to <u>achieve most</u> of its <u>major</u> global environmental objectives, and yields satisfactory global environmental benefits, with only minor shortcomings.							
Moderately Satisfactory (MS)	Project is expected to <u>achieve most</u> of its major <u>relevant</u> objectives but with either significant shortcomings or modes overall relevance. Project is expected not to achieve some of its major global environmental objectives or yield some of the expected global environmental benefits.							
Moderately Unsatisfactory (MU)	Project is expected to achieve <u>some</u> of its major global environmental objectives with major shortcomingsor is expected to <u>achieve only some</u> of its major global environmental objectives.							
Unsatisfactory (U)	Project is expected <u>not</u> to achieve <u>most</u> of its major global environmental objectives or to yield any satisfactory global environmental benefits.							
Highly Unsatisfactory (HU)	The project hasfailed to achieve, and is not expected to achieve, <u>any</u> of its major global environmental objectives with no worthwhile benefits.							

Implementation Progress (IP)		
Highly Satisfactory (HS)	Implementation of <u>all</u> components is in substantial compliance with the original/formally revised implementation plan for the project. The project can be presented as "good practice".	
Satisfactory (S)	Implementation of <u>most</u> components is in substantial compliance with the original/formally revised plan except for only few that are subject to remedial action.	
Moderately Satisfactory (MS)	Implementation of <u>some</u> components is in substantial compliance with the original/formally revised plan with some components requiring remedial action.	
Moderately Unsatisfactory (MU)	Implementation of <u>some</u> components is <u>not</u> in substantial compliance with the original/formally revised plan with most components requiring remedial action.	
Unsatisfactory (U)	Implementation of most components in not in substantial compliance with the original/formally revised plan.	
Highly Unsatisfactory (HU)	Implementation of <u>none</u> of the components is in substantial compliance with the original/formally revised plan.	

Risk ratings		
Risk ratings will access the overall risk of factors internal or external to the project which may affect implementation or prospects for achieving project objectives. Risk of projects should be rated on the following scale:		
High Risk (H)	There is a probability of greater than <b>75%</b> that assumptions may fail to hold or materialize, and/or the project may face high risks.	
Substantial Risk (S)	There is a probability of between <b>51%</b> and <b>75%</b> that assumptions may fail to hold or materialize, and/or the project may face substantial risks.	
Moderate Risk (M)	There is a probability of between 26% and 50% that assumptions may fail to hold or materialize, and/or the project may face only moderate risk.	
Low Risk (L)	There is a probability of up to 25% that assumptions may fail to hold or materialize, and/or the project may face only low risks.	