



China, People's Republic of: Chemical Industry Energy Efficiency and Emission Reduction Project

Project Name	Chemical Industry Energy Efficiency and Emission Reduction Project
Project Number	47051-002
Country	China, People's Republic of
Project Status	Active
Project Type / Modality of Assistance	Loan
Source of Funding / Amount	Loan 3308-PRC: Chemical Industry Energy Efficiency and Emission Reduction Project Ordinary capital resources US\$ 100.00 million
Strategic Agendas	Environmentally sustainable growth Inclusive economic growth
Drivers of Change	Governance and capacity development Partnerships Private sector development
Sector / Subsector	Energy - Energy efficiency and conservation
Gender Equity and Mainstreaming	No gender elements
Description	The proposed Chemical Industry Energy Efficiency and Emission Reduction Project will support demonstration of innovative technologies to improve energy efficiency and reduce emissions of pollutants from various plants belonging to the China National Chemical Corporation Group (ChemChina). Building up on the lessons learned from previous successful Asian Development Bank (ADB) loans in Anhui, Guangdong, Shandong, and Hebei provinces, this project proposes for the first time to directly cooperate with a large state-owned enterprise (SOE) to support industry-specific measures. It will also develop an innovative financing structure to leverage commercial cofinancing and mainstream energy service company (ESCO) participation from the beginning of project implementation. The innovative financing structure will be developed and firmed up during the early stage of the project preparatory technical assistance (PPTA) implementation.

Project Rationale and Linkage to Country/Regional Strategy

Energy efficiency investments are essential to curb demand growth and reduce carbon dioxide emissions. The International Energy Agency projects that energy efficiency improvements could account for 70% of the reduction in global energy demand in 2035. However, without demonstrating best available technologies, stronger policies and more innovative financing mechanisms, the agency warns that more than half of the economic potential may remain untapped. The People's Republic of China (PRC) is the world's largest energy consumer accounting for nearly 20% of global energy consumption. Its rapid energy consumption growth over the past 20 years was and continues to be mainly driven by industrial energy demand growth, which accounted for 71% of the total energy consumption in 2010. The chemical industry is among the PRC's (i) largest industrial energy users, and (ii) most energy-intensive industries. It alone consumed 361.2 million ton of coal equivalent (tce) in 2010, accounting for about 16% of industrial energy use. Compared to the PRC's average energy intensity of 1.034 tce per CNY10,000 of gross domestic product, ChemChina's energy intensity was 2.66 in 2010.

During the Eleventh Five-Year-Plan, 2006_2010, the PRC successfully targeted energy-intensive industries to realize energy savings and emission reduction through (i) mandating energy savings target on 1,000 key energy consuming plants, (ii) subsidizing energy efficiency investments, (iii) strengthening capacity of banks and ESCOs by multiple multilateral and bilateral cooperation projects, and (iv) undertaking other complementary administrative measures. These policy measures were continued, further strengthened and expanded to 10,000 key industries in the Twelfth Five-Year Plan, 2011_2015. However, important market barriers still remain in energy-intensive industries such as chemical industry, which continues to slow down or prevent investment in large-scale, innovative technology energy efficiency and emission reduction retrofits through the market. These barriers include (i) limited market-based incentives to implement such projects; (ii) lack of knowledge by enterprises about the best available technologies, combined with their focus on capacity expansion; (iii) inadequate capacity in commercial banks in evaluating risks and benefits of such retrofit projects combined with the projects' insufficient collateral value; and (iv) the underdevelopment of the industry-specific ESCO that can plan and implement such projects. To address these barriers and to enhance the overall impact of the proposed project, it is essential to develop and test new and innovative solutions to financing such projects and strengthen the ESCO model.

The project is directly relevant to achieve the objectives of the PRC's 12th plan for energy saving and emission reduction which targets to reduce (i) energy intensity by 16%, (ii) carbon intensity by 17%, and (iii) sulfur dioxide by 8% and nitrogen oxides by 10% from 2010 levels by 2015. It has a particular good fit with major tasks emphasized in the 12th plan of (i) strengthening industrial energy saving, and (ii) advancing emission reduction of major pollutants in key industries. The project is also consistent with the ADB's country partnership strategy, 2011_2015 for the PRC, which is closely aligned to the 12th plan priorities to support environmentally sustainable growth by demonstrating cutting-edge energy efficiency technologies.

The proposed first two subprojects include (i) demonstration of a new technology by Dezhou Shihua Chemical Co., Ltd. (DSC) to retrofit its polyvinyl chloride (PVC) production facility to reduce energy consumption by 40% and eliminate the use of mercury as a catalyst; and (ii) retrofitting the caustic soda production chain of Haohua Yuhang Chemical Co. Ltd. (HYC) with the current state-of-the-art technology that will consume 30% less energy. As per the International Energy Agency, caustic soda and PVC production consumes about two-thirds of total primary energy in the chemical industry worldwide. By targeting these two energy-intensive production processes, the project aims for larger impact on energy efficiency and emission reductions in chemical industry in the PRC. Similarly, by mainstreaming ESCO in the project's structure, the project will address a key barrier that has so far prevented industry-specific ESCO participation in energy efficiency retrofits in energy-intensive industries in the PRC. If proven successful, it may unleash ESCO model across energy-intensive industries.

Impact	Environmental sustainability of the PRC's chemical industry enhanced
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Project Outcome

Description of Outcome	Energy efficiency in and emissions from PVC and fluoropolymer production within ChemChina reduced
Progress Toward Outcome	Procurement of major equipment for the plasma incineration plant for the effective avoidance of HFC-23 in the CGY plant started in October 2015 and completed in December 2015. Commissioning has been satisfactory. The HFC-23 plant has been put in operation and in February 2016, its first month of full operation, worked reliably so far to destroy 75 tons of HFC-23.

Implementation Progress

Description of Project Outputs	More efficient and less hazardous PVC technology at commercial scale at DSC plant demonstrated Energy efficiency and greenhouse gas abatement measures at CGY plant implemented
Status of Implementation Progress (Outputs, Activities, and Issues)	To be assessed. To be assessed. To be assessed.

Geographical Location	
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Safeguard Categories

Environment	FI
Involuntary Resettlement	FI
Indigenous Peoples	FI

Summary of Environmental and Social Aspects

Environmental Aspects
Involuntary Resettlement
Indigenous Peoples

Stakeholder Communication, Participation, and Consultation

During Project Design
During Project Implementation

Business Opportunities

Consulting Services	<p>The PPTA will be implemented in two parts. Part 1 will focus on the (i) development of an innovative ESCO financing mechanism, and (ii) energy audit and environmental impact assessment (EIA). A review of ChemChina and chemical industry energy efficiency and emission reduction market assessment and barrier analysis will also be undertaken during part 1. Since these activities are independent activities, four individual consultants (2 international for a total of 6.5 person-months and 2 national for a total of 7 person-months) will be recruited in accordance with ADB's Guidelines on the Use of Consultants (2010, as amended from time to time). The energy efficiency finance experts will work closely with ChemChina, NDRC, and ADB to develop the financing mechanism. The international environment expert will be supported by a national technical expert to prepare the energy audit and the EIA.</p> <p>Part 2 will be undertaken by a consulting firm, which will prepare the technical, economic, and financial due diligence of the subprojects to be undertaken. It will also provide capacity strengthening and project implementation support and capacity development measures to the project management office and other stakeholders, if needed. The detailed tasks to be undertaken by the consulting firm will be firmed up towards the end of the part 1. The consulting firm will be recruited in accordance with ADB's Guidelines on the Use of Consultants (2010, as amended from time to time) through quality- and cost-based selection method (with a quality-cost ratio of 80:20) following the simplified technical proposal.</p>
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Responsible Staff

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Timetable

Concept Clearance	17 Jun 2013
Fact Finding	16 Mar 2015 to 27 Mar 2015
MRM	04 Jun 2015
Approval	03 Nov 2015
Last Review Mission	-
Last PDS Update	30 Mar 2017

Loan 3308-PRC

Milestones					
Approval	Signing Date	Effectivity Date	Closing		
			Original	Revised	Actual

30 Oct 2015

29 Jan 2016

14 Jun 2016

31 Aug 2021

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Financing Plan		Loan Utilization			
	Total (Amount in US\$ million)	Date	ADB	Others	Net Percentage
Project Cost	163.28	Cumulative Contract Awards			
ADB	100.00	30 Oct 2015	0.00	0.00	0%
Counterpart	63.28	Cumulative Disbursements			
Cofinancing	0.00	30 Oct 2015	23.00	0.00	23%

Status of Covenants						
Category	Sector	Safeguards	Social	Financial	Economic	Others
Rating	-	-	-	Satisfactory	-	-

Project Page <https://www.adb.org/projects/47051-002/main>

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