

CLIMATE CHANGE ASSESSMENT

I. BASIC PROJECT INFORMATION

Project Title:	Bank of Xingtai Green Finance Development Project
Project Cost:	€681 million (inclusive of €1 million equivalent costs for capacity development and IT system development, funded by the Bank of Xingtai)
Location:	Hebei Province, People's Republic of China (PRC)
Sector:	Finance
Theme:	Financial Sector Development
Brief Description:	The project will finance qualified green finance subprojects that comply with the national and international green finance taxonomies, and about 32% of the subproject are expected to have climate mitigation impact. It is expected that the subprojects will not likely have climate adaptation impact. The potential subprojects include emission reduction and energy efficiency to industrial and manufacturing production processes, among others. The subproject sites are likely located in government-designated industrial zones and other commercial sites in Hebei Province, PRC. These subprojects are unlikely to be affected by weather or climate conditions.

Source: Asian Development Bank.

II. SUMMARY OF CLIMATE CHANGE FINANCE

Table 1: Summary of Project Finance

Project Financing		Climate Finance ^a	
Source	Amount (€ million)	Adaptation (€ million)	Mitigation (€ million)
Asian Development Bank (\$199 million equivalent)	170	0	54
The Bank of Xingtai counterpart commercial financing (\$199 million equivalent)	170	0	54
Catalyzed private sector and commercial finance ^a (\$398 million equivalent)	340	0	108
The Bank of Xingtai's own funds ¹ (CNY7 million)	1	0	0

^a The €1 million equivalent costs for capacity development and IT system development, funded by the Bank of Xingtai, will not directly contribute to the climate mitigation and is not included in the calculation of climate mitigation finance.

Source: Asian Development Bank.

III. SUMMARY OF CLIMATE RISK SCREENING AND ASSESSMENT

A. Sensitivity of Project Components to Climate or Weather Conditions and the Sea Level

Hebei Province is in the northeastern part of the People's Republic of China, and most of central and southern Hebei Province lies within the North China Plain. Hebei Province has a continental monsoon climate, with cold, dry winters, and hot, humid summers. Temperatures average -16 to -3 °C (3 to 27 °F) in January and 20 to 27 °C (68 to 81 °F) in July. Annual precipitation ranges from 400 to 800 millimeters (16 to 31 inches), concentrated heavily in summer. It has a relatively small opening that connects to the Bohai Sea. The increase in sea level could potentially affect the rate of surface runoff in the province and the corresponding infrastructure especially drainage, irrigation, highways, and flooding in otherwise flood free areas, but this is not a significant risk. While the third National Communication on Climate Change¹ submitted by PRC to the secretariat of the United Nations Framework Convention on Climate Change has identified Hebei Province as one of the vulnerable zones affected by climate change, the expected sea level rise by 70 to 150 millimeters in the next 30 years has no immediate impact on the subproject development and implementation from 2020 – 2026 .²

The project is a financial intermediation loan to the Bank of Xingtai for re-lending to qualified green finance subprojects. The green finance subprojects to be financed under the Asian Development Bank (ADB) project will comply with the national and international green finance standards and taxonomies. They will have positive environmental mitigation impact. At the same time, the subprojects, potentially including emission reduction components of the industrial and manufacturing transformation and production lines upgrade (to be more energy efficient), biofuels production, and waste-to-energy projects, will mostly be located in pre-selected commercial lands and unlikely be affected by climate changes in the short-term.

In summary, in the short-term, the ADB project and its financed subprojects are unlikely to be affected by the climate or weather conditions, during the project implementation period from 2020 – 2026 .

B. Climate Risk Screening

The climate change risk assessment for the project is based on the likelihood of changes in climatic variables; the magnitude of climate change; and the severity of the climatic variables on the project activities. The assessment is based on a review of historical data and projected climate change scenarios. Historical likelihood of severe storms, floods, and droughts will unlikely impact the industrial and commercial productions during the ADB project implementation period from 2020 – 2026 .

Climate Risk Classification: *low*

Low – the ADB project has no direct physical impact and is intended to fund only climate positive and resilient subprojects.

¹ Third National Communication on Climate Change, English version for reference only, December 2018 seen on May 17, 2020 at https://www4.unfccc.int/sites/SubmissionsStaging/NationalReports/Documents/23146085_China-BUR2-1-China_BUR2_English.pdf

² Bulletin of Sea Levels in China 2017.

C. Climate Risk and Adaptation Assessment

The climate screening identified the following risks which may affect the project: lack of precipitation/drought, intense precipitations and floods, extreme high temperatures, and cold events.

The climate screening identified seasonal flooding and storm as a moderate risk affecting project sitting and/or design, construction, maintenance, and performance. Especially, seasonal flooding or storm can cause damages to construction sites and facilities (both construction phase and operational sites) for flood control and soil erosion protection.

The climate screening identified lack of precipitation (seasonal drought) as a minor risk affecting project sitting and/or design, construction, maintenance, and performance. Drought may cause difficulties in water supply and daily operation of project activities.

The screening identified extremely weather as a minor risk affecting project sitting and/or design, construction, maintenance, and performance. The facilities and equipment will be affected by the extreme weather.

Table 2: Potential Climate Change Impacts

Climate drivers	Aspect	Impacts	Risks
Drought (less rainfall)	Water resource	Lower river flows - less reliable sources and /or reduction in yields	Increased risk of water resource being reduced
		Increased risk of water supply	Impacts security of supply
	Water supply	Insufficient water for production	Disruption to supply chain
Flood (higher rainfall)	Water resource	Increased runoff leads to diffuse pollution	Reduction in water quality
	Water supply	Increased risk of treatment works being flooded.	Service loss and outage
		Direct flooding causes contaminants to enter pipelines and storage tanks	Increased drinking water quality risk
		Increased flooding	Increased risk of service loss
	Wastewater and stormwater network	Facilities and infrastructure (e.g., pump station) may be flooded.	Service capacity will be interrupted, or lost, and contamination accidents may be caused by system shut down. Additional repairs or replacement of infrastructure may be required.
	Transportation	Storm and flood caused inundated roads	Traffic will be interrupted or delayed according to the manner of flood propagation.
Extreme weather	Production activities	Extreme weather affects buildings, equipment and	Equipment and facilities aging will be accelerated, and may require earlier

		facilities. Industrial average daily water consumption and peak water will increase in high temperature weather.	replacement or repairs; wastewater quantity will be increased and wastewater treatment chain will be affected.
<p>The adaptation measures could potentially include: (i) security of water supply of subprojects; (ii) enhancement of water treatment facilities and wastewater treatment facilities' capacity (if applicable); (iii) improvement of flood control standards; and (iv) improvement of project sitting/design, maintenance and performance. Based on the sample indicative subproject pipeline, they are unlikely impacted by the above during the project implementation period.</p>			
<p>D. Climate Risk Screening Tool and/or Procedure Used</p> <p>The climate risk screening tool will depend on the nature of the industry and the location of the subprojects, among others, to identify risks to flooding, hotter summer and colder winter, and the resources required especially water availability. The Bank of Xingtai, under the ADB guidance, can work with the subborrowers on the subproject initial environmental examination. The ADB project team and/or any third-party consulting firm may provide advice to the Bank of Xingtai if the risk is substantial.</p>			

Source: Asian Development Bank.

IV. CLIMATE ADAPTATION PLANS WITHIN THE PROJECT

Table 3: Preliminary Climate Adaptation Plan within the Project

Adaptation Activity	Target Climate Risk	Estimated Adaptation Costs (\$ million)	Adaptation Finance Justification
Security of water supply	Drought and flood	TBD	TBD
Enhancement of water treatment facilities and wastewater treatment facilities' capacity	Flood and high temperature	TBD	TBD
Improvement flood control standard	Flood	TBD	TBD
Improvement of project sitting / design, maintenance and performance	Drought, flood and extreme weather	TBD	TBD

Please note that due to the diverse nature of the subprojects and the still pending subproject pipeline, estimated adaptation costs cannot be accurately provided.

Source: Asian Development Bank.

V. CLIMATE MITIGATION PLANS WITHIN THE PROJECT

The PRC's third National Communication on Climate Change submitted to the United Nations Framework Convention on Climate Change (UNFCCC) cited earlier listed priority sectors for

climate change mitigation (specifically pages 170 to 173). The priority sectors identified are (i) energy efficiency, (ii) renewable energy, (iii) emission reduction and control systems in smelting restoration technology in the iron and steel industry, (iv) emission reduction and control systems in cement kilns, (v) introduction of electric vehicles, freight transportation optimization models, optimization of energy consumption in road transport, and (vi) reuse, more efficient use, and recovery of wastes and waste energy. These technologies are potential climate change mitigation subprojects. The main indicator in the mitigation subprojects will be the reduction in greenhouse gas emissions. The greenhouse gas emissions will be measured using the procedures and methodologies of similar projects registered in the UNFCCC CDM registry. This assures that the greenhouse gas reduction is verifiable and in accordance with accepted international practice even if no financial gain is obtained from the mitigation measures.

The project is a financial intermediation loan to the Bank of Xingtai to finance green subprojects. The subprojects will be evaluated by the Bank of Xingtai not only on the green nature but also on other factors required in standard banking lending practices. The subprojects will likely require an initial environmental examination. As a part of the process, the quantities of greenhouse gas emission reduction, the cost of mitigation, and the justification will be described in detail. During the subproject implementation, the innovative green finance information system may also conduct environmental assessments based on the subproject monitoring and reviews through inputting the relevant data. For purposes of illustration, three potential subprojects are outlined below:

Table 4: Potential Subproject Climate Change Impact

No.	Subproject Title	Type	Owner -ship	Total Cost (\$M)	Loan Amount (\$M)	GHG Emission calculations	GHG Emission Reduction (tCO ₂ /yr)	Mitigation finance (\$M)
1	Advanced Energy Technology (Neiqiu) Biomass Energy Co., Ltd.	Biomass	Private	50	14	Basis: Capacity= 1 MW Cost= \$2M/MW LF=80% Baseline is grid; Efgrid=0.494 tCO ₂ /MWh (MDB harmonized grid factor) Annual generation= 1MW*8,760hrs/yr*80%=7,008 MWh/yr Baseline Emission = 7,008 MWh/yr*0.494 tCO ₂ /MWh=3,462 tCO ₂ /yr Baseline CO ₂ /cost = 3,462 tCO ₂ /yr/\$2M=1,731 tCO ₂ /\$M-yr Project emission = 0 (biomass power plant is RE; its emission is biogenic) Unit ER=Baseline-Project = 1,731 tCO ₂ /\$M-yr - 0 =1,731 tCO ₂ /\$M-yr Total Investment = \$50M Total ER=\$50M*1,731 tCO ₂ /\$M-yr=86,550 tCO ₂ /yr	86,550	14
2	Hebei Jinbaoshi Recycling Resource Development Co., Ltd.	Waste-to-energy	Private	79	20	Annual Generation=120,000 MWh/year (given in the excel file) Cost: \$2.5M/MW Baseline is grid; Efgrid=0.494 tCO ₂ /MWh Assumption: 100% of wastes is organic; its emission is biogenic. Baseline emission=120,000 MWh/year*0.494 tCO ₂ /MWh=59,280 tCO ₂ /yr Baseline CO ₂ /cost = 59,280 tCO ₂ /yr/\$2.5M=23,712 tCO ₂ /\$M-yr Project emission = 0 (biomass power plant is RE; its emission is biogenic) Unit ER=Baseline-Project = 23,712 tCO ₂ /\$M-yr - 0 =23,712 tCO ₂ /\$M-yr Total Investment = \$79M	1,873,248	20

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						Total ER=\$79M*23,712 tCO ₂ /\$M-yr=1,873,248 tCO ₂ /yr		
4	Hebei Chenxu New Energy Science and Technology Co., Ltd.	Alcohol-based fuel for vehicles	Private	14	4	Alcohol-based fuel (Project): NCV=27 TJ/1,000tons Production=200,000 tons/yr (see excel file) Total Energy content =200,000 tons/yr*27 TJ/1,000tons =5,400 TJ/yr Fuel is assumed to be plant-based (organic). Project Emissions=0 Gasoline (baseline): NCV=44.3TJ/1000tons EF=69.3 tCO ₂ /TJ Baseline emission = 5,400 TJ/yr*69.3 tCO ₂ /TJ=374,220 tCO ₂ /yr ER= 374,220 tCO ₂ /yr	374,220	4
5	Hebei Jinwu Science and Technology Co., Ltd.	Rooftop solar (50 MW)	Private	29	7	LF=20% Annual generation=50MW*8760 hrs/yr*20%=87,600 MWh/yr Grid EF=0.494 tCO ₂ /MWh Baseline emission = 87,600 MWh/yr*0.494 tCO ₂ /MWh=43,374 tCO ₂ /yr. Project emission (solar) = 0 ER=43,374 tCO ₂ /yr.	43,374	7
7	Hebei Yili Rubber & Plastic Group Co Ltd	Production line modernization and upgrade	Private	167	29	Assumptions: (a) 50% of Investment goes to improving energy efficiency (b) Payback period for the EE investment is 5 years (c) Only electricity is saved the EE investment (d) Cost of electricity in China =\$0.094/kWh	87,764	14.5

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						(https://www.globalpetrolprices.com/China/electricity_prices/) EE Investment = 50%*\$167M=\$83.5M Electricity savings = \$83,500,000/5 yrs =\$16,700,000/yr Electricity savings (MWh/yr) =\$16,700,000/yr/\$0.094/kWh=177,659,574.5 kWh/yr=177,659.57 MWh/yr EF=0.494 tCO ₂ /MWh ER = 177,659.57 MWh/yr*0.494 tCO ₂ /MWh=87,764 tCO ₂ /yr		
Subtotal				339	74		2,465,156	59.5
Original Subproject Total				1,063				

Out of the total indicative subproject pipeline of \$1,063 million, it is estimated that \$339 million have climate mitigation impact, or about 32% of the subprojects. Based on €170 million total ADB project costs, €54 million will have climate mitigation impact. Based on the eligible climate mitigation (total) subproject costs of \$339 million, the total greenhouse gas emission reduction is estimated at 2,465,156 tCO₂e. This equals to 7,272 tCO₂e greenhouse gas emission reduction per million dollars financed (2,465,156 tCO₂e / \$339 million). Based on the €54 million (\$64 million), the total greenhouse gas emission reduction is estimated to be 465,408 tCO₂e of greenhouse gas emission. For the total ADB project of \$800 million equivalent EUR (excluding exchange rate fluctuation), this translates to 1,861,632 tCO₂e per annum (465,408 tCO₂e of greenhouse gas emission x 4).