



**GREEN
CLIMATE
FUND**

Meeting of the Board
12 – 14 November 2019
Songdo, Incheon, Republic of Korea
Provisional agenda item 14

GCF/B.24/02/Add.01

22 October 2019

Consideration of funding proposals - Addendum I

Funding proposal package for FP082

Summary

This addendum contains the following seven parts:

- a) A funding proposal titled “Catalyzing Climate Finance (Shandong Green Development Fund)”;
- b) No-objection letter issued by the national designated authority(ies) or focal point(s);
- c) Environmental and social report(s) disclosure;
- d) Secretariat’s assessment;
- e) Independent Technical Advisory Panel’s assessment;
- f) Response from the accredited entity to the independent Technical Advisory Panel’s assessment; and
- g) Gender documentation.

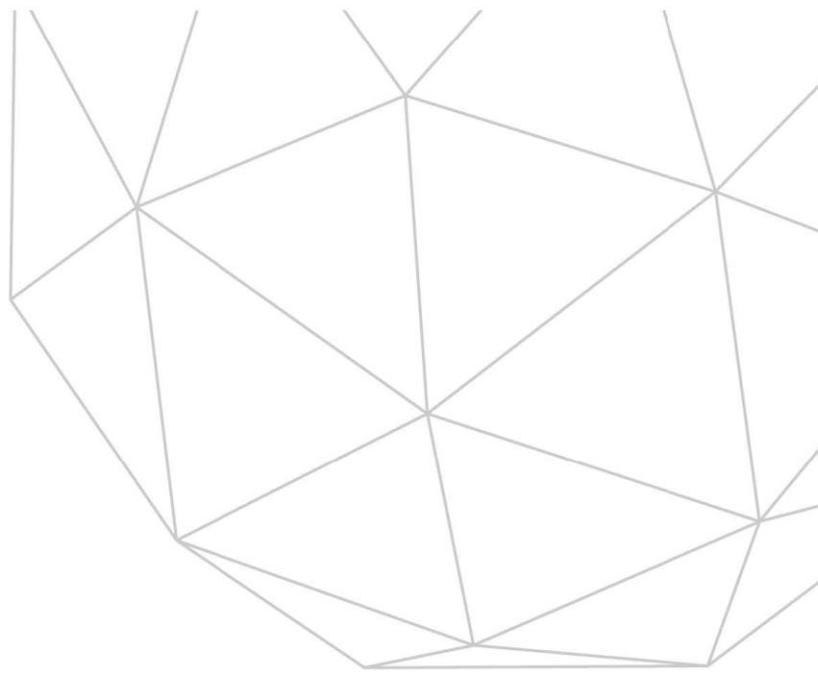
The funding proposal package for FP082 was formerly submitted for the Board’s consideration at its twenty-first and twenty-second meetings and it remains unchanged.

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Funding Proposal

Version : 1.6

The Green Climate Fund (GCF) is seeking high-quality funding proposals.

Accredited entities are expected to develop their funding proposals, in close consultation with the relevant national designated authority, with due consideration of the GCF's Investment Framework and Results Management Framework. The funding proposals should demonstrate how the proposed projects or programmes will perform against the investment criteria and achieve part or all of the strategic impact results.

Programme Title: Catalyzing Climate Finance (Shandong Green Development Fund)

Country: People's Republic of China

Accredited Entity: Asian Development Bank

Date of Submission: 25 June 2018 (Revised: 15/10/19)

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Note to accredited entities on the use of the funding proposal template

- Sections **A, B, D, E** and **H** of the funding proposal require detailed inputs from the accredited entity. For all other sections, including the Appraisal Summary in section F, accredited entities have discretion in how they wish to present the information. Accredited entities can either directly incorporate information into this proposal, or provide summary information in the proposal with cross-reference to other project documents such as project appraisal document.
- The total number of pages for the funding proposal (excluding annexes) is expected not to exceed 50.

Please submit the completed form to:
fundingproposal@gcfund.org

Please use the following name convention for the file name:
"[FP]-[Agency Short Name]-[Date]-[Serial Number]"

A.1. Brief Project / Programme Information		
A.1.1. Project / programme title	Catalyzing Climate Finance (Shandong Green Development Fund)	
A.1.2. Project or programme	programme	
A.1.3. Country (ies) / region	People's Republic of China (PRC)	
A.1.4. National designated authority (ies)	Ministry of Finance (MOF)	
A.1.5. Accredited entity	Asian Development Bank (ADB)	
A.1.5.a. Access modality	<input type="checkbox"/> Direct <input checked="" type="checkbox"/> International	
A.1.6. Executing entity / beneficiary	Executing Entity: Shandong Provincial Government Beneficiary: Population of Shandong Province (99.47 million in 2016)	
A.1.7. Project size category (Total investment, million USD)	<input type="checkbox"/> Micro (≤ 10) <input type="checkbox"/> Small ($10 < x \leq 50$) <input type="checkbox"/> Medium ($50 < x \leq 250$) <input checked="" type="checkbox"/> Large (> 250)	
A.1.8. Mitigation / adaptation focus	<input type="checkbox"/> Mitigation <input type="checkbox"/> Adaptation <input checked="" type="checkbox"/> Cross-cutting	
A.1.9. Date of submission	25 June 2018 (6 th Revision 15 October 2019)	
A.1.10. Project contact details	Contact person, position	Hubert Jenny, Principal Infrastructure Specialist
	Organization	Asian Development Bank
	Email address	hjenny@adb.org
	Telephone number	+86 10 8573 0883
	Mailing address	Asian Development Bank PRC Resident Mission 17 th Floor, China World Tower A No. 1. Jian Guo Men Wai Avenue Beijing 100004 People's Republic of China

A.1.11. Results areas *(mark all that apply)*

Reduced emissions from:

- Energy access and power generation**
(E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.)
- Low emission transport**
(E.g. high-speed rail, rapid bus system, etc.)
- Buildings, cities and industries and appliances**
(E.g. new and retrofitted energy-efficient buildings, energy-efficient equipment for companies and supply chain management, etc.)
- Forestry and land use**
(E.g. forest conservation and management, agroforestry, agricultural irrigation, water treatment and management, etc.)

Increased resilience of:

- Most vulnerable people and communities**
(E.g. mitigation of operational risk associated with climate change – diversification of supply sources and supply chain management, relocation of manufacturing facilities and warehouses, etc.)
- Health and well-being, and food and water security**
(E.g. climate-resilient crops, efficient irrigation systems, etc.)
- Infrastructure and built environment**
(E.g. sea walls, resilient road networks, etc.)
- Ecosystem and ecosystem services**
(E.g. ecosystem conservation and management, ecotourism, etc.)

A.2. Programme Executive Summary (max 300 words)

The Programme pilots a transformational financing mechanism of \$1.5 billion to catalyze climate finance for a portfolio of climate subprojects compliant with the Investment Framework of the Green Climate Fund. Shandong province faces mounting climate change-induced challenges and the Programme is fully aligned with the proactive policies to decarbonize its economy. Shandong tops China's energy consumption and is challenged by the impacts of a growing transportation sector; these two sectors account for most of greenhouse gas emissions. Climate vulnerability is a limiting factor for growth and at the core of the water – food – energy nexus. In response, Shandong requires significant investment on: (i) mitigation from energy, urban activities and industrial transformation; and (ii) adaptation from water resources, agriculture, coastal and ecological areas. The investment priorities come from the climate assessment where catalyst financing is deployed more effectively. Shandong set a target to achieve peaking of CO₂ emissions by 2027, three years earlier than the national goal under the Intended Nationally Determined Contributions.

The Programme aims to leverage private, institutional and commercial finance for climate resilient subprojects assessed against both climate and financial eligibility criteria. The Programme consists of a mix of public and private sector capital of \$1 billion and catalytic resources of \$500 million from international financing institutions, including a proposed Green Climate Fund contribution of \$180 million, required to reach sufficient critical mass of funding to achieve a leverage ratio over 5. The Programme finances a portion of the capital expenditures of selected climate subprojects for a capped period to make the subprojects bankable, by addressing the upfront risks, promoting advanced technologies and an integrated approach to climate finance. The level of catalytic funding and the financing terms are linked to the climate criteria and performance is in line with the Green Climate Fund investment criteria and framework.

A.3. Programme Milestone

Expected approval from accredited entity's Board (if applicable)	ADB: 2019 Q3 (Approved on 25 September 2019) Co-financing from Agence Française de Développement (AFD) / Kreditanstalt für Wiederaufbau (KfW): 2019 Q4 (To be confirmed by the government)
Expected financial close (if applicable)	First close: 2020 Q2 for ADB/AFD/GCF/KfW & public financing Final close: 2020 Q4 for private capital
Estimated implementation start and end date	Start: 2020 Q2 End: 2039 Q2
Project/programme lifespan	20 years from financial close

B.1 Description of Financial Elements of the Programme

The Programme “Catalyzing Climate Finance (Shandong Green Development Fund)” pilots a transformational and disruptive financing mechanism to leverage catalytic funding from international financing institutions (IFIs) with private, institutional and commercial (PIC) finance towards climate related subprojects compliant with the Green Climate Fund (GCF) investment framework in Shandong Province, People’s Republic of China (PRC). The concept is based on an Asian Development Bank (ADB) flagship publication¹ and is implemented for the first time with the Shandong Green Development Fund (SGDF) to support the provincial government’s proactive policies to decarbonize its economy

SGDF is designed as a \$1.5 billion public-private financing facility, targeting higher risk climate-resilient infrastructure subprojects, green and high technology manufacturing businesses, and investment in municipal and sectoral sub-funds in Shandong Province². All SGDF investments must be compliant with the GCF investment framework and follow the principles, terms and conditions agreed and approved by ADB and the co-financiers, including subproject eligibility criteria, governance, implementation arrangements, environmental and social management system (ESMS), gender consideration, monitoring and evaluation (M&E) and verification. Sub-funds in which SGDF invests or with which it co-invests under a co-investment agreement will be required to adopt the same investment criteria and systems. **No Business As Usual (BAU) subprojects (defined as development projects not compliant with the criteria set out in the GCF Investment Framework) can be financed by SGDF.**

SGDF is structured as a limited partnership (closed end fund) and set up for 20 years under PRC laws and regulations. It is developed as a dedicated investment fund, managed by a Fund Management Company (FMC) to:

- mobilize at both Fund, sub-fund, and subproject level additional capital from public and private sources, and
- contribute to capacity development in the PRC in general and Shandong in particular for climate finance and climate resilience.

The Programme assists in:

- Identifying climate change (CC) related subprojects and maximizing their greenhouse gases (GHG) mitigation and/or adaptation benefits, with verification;
- Contributing to the bankability of CC subprojects by introducing a level of catalytic funding;
- Crowding-in PIC funding to maximize CC mitigation and adaptation impacts; and
- Creating performance incentives by linking fund pricing to CC indicators as well as to creditworthiness, linked to both CC and bankability indicators.

The Programme is designed to link higher CC performance (Transformational; Advanced Benefits; and Good Practices) as defined under the GCF Investment Framework with a higher level of catalytic funding based on measurable CC indicators in line with the GCF investment criteria. As a result, the Programme incorporates:

- Methodology for benchmarking the SGDF’s portfolio composition against the priority sectors for climate mitigation and adaptation interventions in Shandong Province, as defined by its GHG inventory assessment and climate vulnerability analysis, summarized in Section C1;
- Methodology for defining performance of CC subprojects compliant with the GCF Investment Framework and going beyond BAU, in relation to mitigation (GHG emissions reduction), adaptation (number of beneficiaries), environmental co-benefits and cost effectiveness in SGDF’s priority sectors; and recommendations for target values relating to performance against sectoral indicators;³
- Key requirements of PRC climate finance policy in line with the co-financiers (especially the GCF), which provide the broad eligibility and performance criteria for climate related subprojects;
- Independent climate / green rating of subprojects⁴ (including M&E and verification), provided by TA financed under the Technical Assistance (TA) Program (Component 3.3); and
- Principles for green procurement⁵ to ensure the greening of the climate related subprojects’ supply chain.

¹ ADB. 2017. *Catalyzing Green Finance: A concept for leveraging blended finance for green development*. Manila

² Some investments may take place outside Shandong Province but would originate from Shandong.

³ Annex 9 *SGDF Transaction Assessment Guidelines*

⁴ Annex 11 *Monitoring and Evaluation Reporting*

⁵ Annex 13 *Green Procurement*

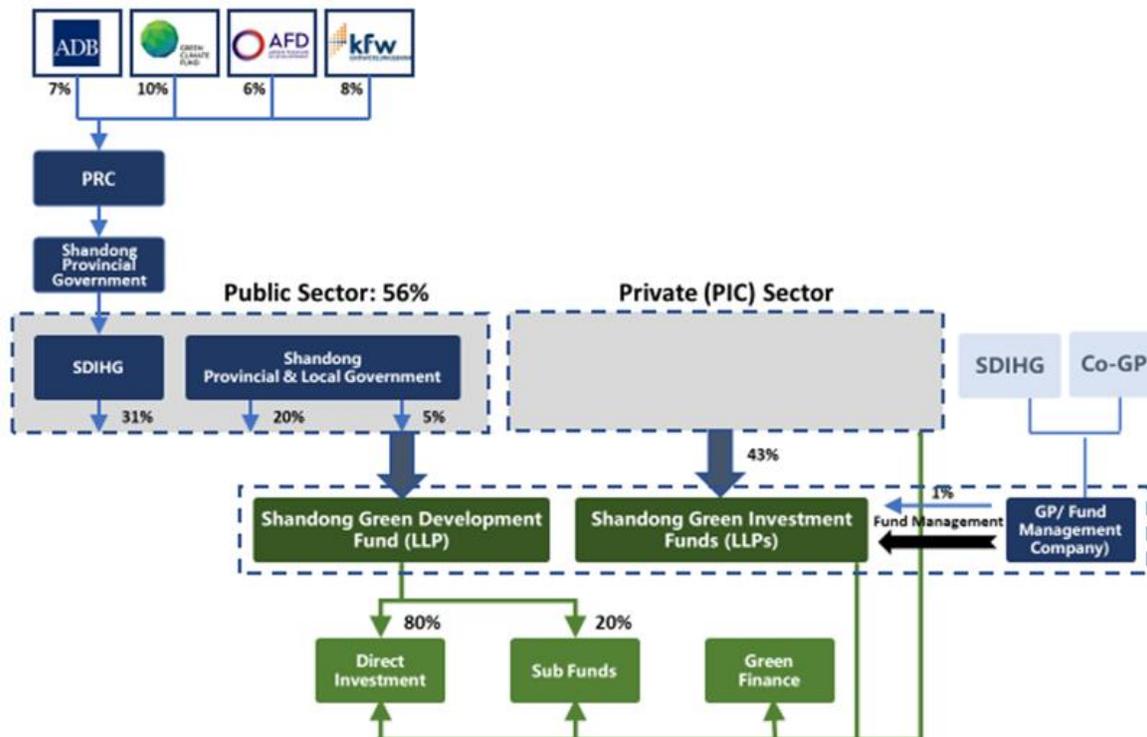
SGDF Capital Structure

The Shandong provincial government (SPG) is establishing SGDF to transform and decarbonize its economy under an experienced financial intermediary, the Shandong Development Investment Holdings Group⁶ (SDIHG), a State-Owned Enterprise fully owned by SPG. SDIHG operates under the PRC's commercial law and is financially autonomous. SDIHG's track record of successful investment provides a sound base for implementing a Fund based on the ADB's Green Finance Catalyzing Facility (GFCF) concept (footnote 1). SDIHG has experience in ensuring that planned investments meet broader policy requirements, as well as more stringent criteria than common practice. SPG and SDIHG management are very supportive of making SGDF a world-class facility for mainstreaming climate finance across the province and to be replicated in other PRC provinces, as well as by ADB in the Asia-Pacific Region. Integrity due diligence performed following ADB's guidelines⁷ on the Programme's stakeholders did not raise any flags.

The financing plan to fund \$1.5 billion (CNY10 billion) for SGDF includes public funding (over \$800 million), of which catalytic funds from IFIs (about \$500 million). PIC funds (about \$650 million) will be invested in subprojects, either as limited partnership interests in the Fund or sub-funds or directly as co-investors in subproject companies. This results in a public - private group of funds and co-investors with an overall ownership structure expected to be approximately 56% and 44%, respectively:

- 31%: Catalytic funds (ADB, AFD, GCF, KfW) through SDIHG;
- 25%: Shandong Provincial Government and Local Governments;
- 43%: PIC investors mobilized by SDIHG; and
- 1%: General Partner.

SGDF Capital Structure



⁶ A description of the state-owned enterprise is included in Section C.4.

⁷ ADB. 2015. *Staff Instruction Integrity Due Diligence for Sovereign Operations and Cofinancing*. Manila.

SDIHG is discussing with several private and institutional stakeholders to invest funds in the Programme either as limited partners in SGDF or in co-investment with GCF with co-financing from AFD, GCF and KfW, representing about \$500 million in catalytic funding (refer to Section B.2). The catalytic funds from IFIs are mixed with public and PIC funds from various sources and managed by the Fund to finance climate resilient subprojects. The General Partner and FMC will be structured as joint venture between SDIHG as a one co-GP and a professional fund manager to be recruited on a competitive basis from among top tier asset managers in the PRC. The fund management fee (expected between 0.5% and 2% of commitments or contributed capital based on current market practices) will be a criterion in selecting the professional fund manager. SDIHG has a dual role as LP into SGDF and as joint venture partner in the GP and FMC. The governance structure of SGDF is presented in Section F.4.

The loans from the IFIs will be senior loans with sovereign obligations of the PRC. PRC, acting through its Ministry of Finance (MOF) will make the IFI funds available to Shandong Provincial Government (SPG) on the same terms and conditions as apply to the sovereign loans, and SPG will on-lend the funds to SDIHG. SDIHG will assume the foreign exchange risk, interest rate risk and investment risk of the loans and the downstream investments. The Fund and sub funds will be managed to time the returns on fund investments to SDIHG to coincide with SDIHG's debt service obligations on the downstream IFI loans. SGDF's cash management (treasury) function will also assist cash flows to enable IFI debt repayment. In addition, SDIHG, as a limited partner in SGDF, will seek an additional 3% return from the fund to compensate SDIHG for its assumption of commercial and debt repayment risks on behalf of PRC. The IFI loans will be disbursed over 5 years, pro rata according to their then outstanding loan commitments where the IFIs are funding the same activities.

SGDF Investment Plan

SGDF's asset allocation consists of:

- Approximately 80% to direct investment into climate resilient infrastructure subprojects and green and high technology manufacturing businesses compliant with the GCF Investment Framework;
- Approximately 20% into climate sub-funds (or pursuant to a co-investment agreement with sub funds) for investment in GCF Investment Framework compliant subprojects in specific municipalities or sectors; and,
- A limited amount of public and PIC sourced funds (No IFIs funds) could be used for treasury investment into AAA (domestic) rated Climate/Green Bonds and other AAA capital market products for liquidity management.

SGDF may attract additional resources to invest in climate/green bonds, asset backed securities (ABS) and/or undertake other climate/green financing activities after the Fund's systems and procedures are established and it has appropriate standing in the national capital markets.

The initial projected funding of \$1.5 billion is allocated as follows:

Component	Sub-component	Amount (for entire project)	Currency	Amount (for entire project)	Local currency	GCF funding amount	Currency of disbursement to recipient
Component 1.1: Financing Direct investment	Climate Infrastructure subprojects & Green Manufacturing	1,190	<u>million USD (\$)</u>	7,933	million CNY	180	million USD
Component 1.2: Financing of Sub-Funds	Municipal & Sectoral Sub-funds	300	<u>million USD (\$)</u>	2,000	million CNY	0	million USD
Total Programme financing		1,490	million USD	9,933	million CNY	180	million USD

Additional components of the Programme generating outcomes relating to overcoming the key constraints to PIC finance identified in Section C and detailed in Section H below are set out in the following table.

Component	Sub-components (see detailed budget)	Amount (for entire project)	Currency	Amount (for entire project)	Local currency	GCF funding amount	Currency of disbursement to recipient
Component 2: Project Development	TA for design and financial structuring support	3.5	million USD (\$)	23.3	million CNY	0	million USD
Component 3: Knowledge & Capacity Development	3.1 Capacity Development 3.2 M&E System Development 3.3 Green rating System Development	6.4	million USD	42.7	million CNY	0	million USD
Component 4: Policy Development	3 policy seminars	0.1	million USD	0.7	million CNY	0	million USD
Total Programme		10.0	million USD	66.7	million CNY	0	million USD

ADB funding for Components 2, 3 and 4 under the Technical Assistance Program.

All downstream investment by SGDF will abide by the GCF Investment Framework and covenants and principles agreed with ADB and the co-financiers, including but not limited to governance, subproject eligibility selection criteria, ESMS, Gender, M&E and verification.

Direct Investment:

The level of catalytic and financing terms and conditions provided by SGDF to a subproject is directly related to the climate-related categorization of the subproject in line with GCF's Investment Framework and cross-referenced with the financial indicator. No BAU subprojects can be financed by SGDF.

GCF Investment Framework	Catalytic Funding*	[Max] Tenor	Average Interest Rate**
Transformational / Best Practices	50%	10	5.1%
Advanced Benefits	40%	7	5.4%
Good Practices	30%	5	5.8%

* Maximum percentage of total financing required for any subproject that is permitted to be financed under SGDF

** Fixed CNY lending rates applicable to the fund's debt investments; pricing is estimated by taking into consideration weighted average cost of catalytic funding, maturity premium, foreign exchange risk spread, and average credit spread
Refer to Financial Model in Annex 3

SGDF Structured Investment in Sub-funds:

Subject to satisfactory due diligence results and no objection from ADB on the Limited Partnership Agreement (LPA) of the sub-fund, SGDF intends to invest into three municipal funds in Jinan, provincial capital (2016 population: 6.33 million); Qingdao (2016 population: 7.91 million) and Yantai (2016 population: 7.06 million) and five sectoral funds (refer to Table in Section C3.). Selected as low-carbon pilot cities under the provincial government program, Qingdao and Yantai aim to peak CO₂ emissions by 2020, and Jinan by 2025 with specific timetables and roadmaps. The sub-funds are structured as limited partnership with a 10-year lifespan. The sub-funds are a complement to SGDF's investment strategy. The sub-funds will be managed by dedicated fund managers with SGDF as a LP.

SGDF Support to Green Business:

SGDF also looks for opportunities to invest into transformational and advanced benefits climate businesses (footnote 7) that support the Province's policies of "Transition of Old to New Driver: Industrial Transformation"⁸ and "Coal Substitution

and Low Carbon Action Plan”⁹. The transformational aspects of the Programme represent a paradigm shift over the current climate investment BAU and are necessary for Shandong to meet its aggressive mitigation (and adaptation) targets identified in the Mitigation and Adaptation Priorities in Shandong Province (Annex 14.2). It does so by: (i) accelerating investments in new technologies; innovative applications of existing technologies; and (ii) mobilizing both private sector financing and private sector service delivery models. Transformational subprojects may pose higher risks due to their innovation – in technology or in project structure. The Programme strikes a balance between the mitigation / adaptation benefits and project risk by first applying green indicators based on the GCF Investment Framework and then rewarding subprojects with high ‘green’ returns with access to catalytic financing.

Some of Shandong’s transformational businesses are still in research and development (R&D) stage and require strong public funding and further policy support to go ahead, but these businesses could receive SGDF funding over the fund’s 20-year life. The transformational businesses headquartered in Shandong Province are a testimony to the commitment of SPG to develop policies targeting climate resilience, coal substitution and transition to a low carbon economy.

Summary of examples of Transformational subprojects with detailed information included in Annex 12:

Name	Scope	Climate Focus
Pre-Cast Solutions Building Climate Resilience in Shandong	Businesses manufacture safe, clean and energy efficient pre-cast concrete frames using green procurement on the supply chain and reducing the construction time onsite	The off-site manufacturing results in significant energy savings through standardization and optimization of design and manufacturing processes as well as safe, energy efficient buildings with major environmental and economic co-benefits for the vulnerable part of the population (social housing; schools, hospitals).
Disruptive “Hydrogen Valley” Leads the Charge for Urban Mobility	The Shandong provincial government in financing a technology park “Hydrogen Valley” to regroup all the R&D and manufacturing businesses related to the production, distribution and storage of hydrogen for mobility	The hydrogen substitutes fossil fuels, especially for transportation. This transformational technology just starting with commercial application is safer and more convenient for vehicles charging compared to e-vehicles
Travel to the Future on Shandong’s Smart Solar Highway	A prototype solar road of 2 kilometers is piloted in Shandong province with various tests implemented until end of 2018.	The transformational technology (still in R&D) of solar roads supports (i) wireless charging of vehicles while driving; (ii) self-driving vehicles; (iii) IoT backbone infrastructure along roads including Wi-Fi applications; (iv) micro-grid applications; (v) energy production to the grid

Technical Assistance Program:

The Programme includes a \$10 million Technical Assistance program consisting of:

- (i) Design Review Advisory: Supports Component 2 through Subprojects screening; Feasibility Study (FS) Review; Climate/Green Indicator Assessment; Sector Specialists and Green Procurement;
- (ii) Monitoring and Evaluation / Reporting and Verification: Supports Component 3 through Reporting module support including: Monitoring; Evaluation and Verification (MEV), including Green and Financial Rating; Financial and Project Management (PPMS), Safeguards and Gender (ESMS); GHG and CO₂ Assessment; Bi-annual ADB reporting and GCF annual performance reporting (GCF APR);
- (iii) Capacity Development: Supports Components 2,3 and 4 through Shandong Climate Investing Policy Advisory; Institutional strengthening; Capacity building; Climate resiliency policy for 14th Five years plan and input into Province Low Carbon Development and Climate Resilience Policies; Impact Studies; Education; Training, including overseas training.

Additional donor funds will be sought in 2019 to enhance the TA program for capacity development for climate finance and climate resilience addressing the vulnerabilities of the key cities in the Province and upscale the Programme.

⁸ Shandong Provincial Government. 2018. *Implementation Plan for the New and Old Kinetic Energy Conversion Pilot Zone*. Jinan.

⁹ Shandong Provincial Government. 2017. *Low Carbon Development Work Plan for Shandong (2017-2020)*. Jinan

B.2. Project Financing Information							
	Financial Instrument	Amount	Currency	Tenor	Pricing		
(a) Total project financing	(a) = (b) + (c)	1,500	million USD (\$)				
(b) GCF financing to recipient	Senior Loans	180	million USD (\$)	Fixed 20 years with 5 years grace period	0.75 %		
	Total requested (i+ii+iii+iv+v+vi)	180	million USD (\$)				
(c) Co-financing to recipient	Financial Instrument	Amount	Currency	Name of Institution	Tenor	Pricing	Seniority
	Loan (OCR)	100*	million USD (\$)	ADB	20 years	LIBOR based	senior
	Loan	75	million euro (€)	AFD	20 years	EURIBOR based	senior
	Loan	100	million euro (€)	KfW	15 years	EURIBOR based	senior
	Equity	375**	million USD (\$)	Local Government	-		
	Equity	626**	million USD (\$)	PIC Finance	-		
	Equity	15**	million USD (\$)	General Partners	-		
	Lead financial institution: Asian Development Bank Letters from the co-financiers are included in Annex 4						
* ADB is discussing the option of lending in euro (to be confirmed at loan negotiations)							
** Paid in Chinese Yuan (CNY)							
(d) Financial terms between GCF and AE (if applicable)	<p>GCF will lend through ADB (AE) to the PRC at the GCF rate (with AE fees paid to ADB).</p> <p>PRC, through MOF, will make the loan proceeds available to SPG on the same terms and conditions as those applied to the sovereign loan.</p> <p>Shandong Finance Bureau will on-lend the loan proceeds to SDIHG on the same terms and conditions as those applied to the sovereign loan.</p> <p>SDIHG, in its role as a limited partner of SGDF, will invest the CNY equivalent of the loan proceeds into SGDF as equity.</p> <p>AFD and KfW will signs separate loan agreements with PRC; SDIHG will receive the AFD and KfW loan proceeds in Euros through Shandong Provincial Government; the AFD and KfW loan proceeds will also be invested into SGDF by SDIHG in its role as Limited Partner.</p>						
B.3. Financial Markets Overview (if applicable)							
<p>Challenges and Programme Response: Over the last ten years, the government with the support of development partners built a strong policy and regulatory framework for climate change. Given the very large investment required,¹⁰ new mechanisms of financing climate-positive investments are needed. Traditional sovereign financing and banking systems have little incentive to cater to CC investment needs (longer term, flexible as to structuring, and competitively priced). A new approach is needed to unlock significant sub-sovereign and private sector finance for local governments. The Programme supports a long-term engagement in the PRC to finance a new generation of climate resilient infrastructure subprojects beyond BAU and with higher risk profiles that would otherwise rely on exclusively long-term sovereign funding or not proceed because of public funding gap. The Programme responds to six interlinked challenges:</p> <p>(i) Develop coherent, prioritized programs of investments to address key CC impacts and vulnerabilities to mainstream climate finance into infrastructure financing beyond BAU given the huge climate change impacts (for PRC these losses are estimated to be of the order of 3.5% of GDP);</p>							

¹⁰ The Chinese Academy for Environmental Planning estimates environmental investment at around CNY 17 billion (\$2.7 billion) under the 13th Five Year Plan (2015 – 2020),

- (ii) Attract advanced technology, new construction techniques and improved operational efficiency to more efficiently develop projects that are categorized as transformational and advanced benefits under the assessment based on GCF Investment Framework;
- (iii) Broaden PIC financing, especially from the growing pension and insurance funds to facilitate the flow of non-government (PIC) infrastructure investment finance to CC subprojects to address the shortfall in public finance – including by addressing the lack of capacity of financing institutions and capital markets to do sub-sovereign and project finance, for projects providing CC mitigation/adaptation and environmental co-benefits;
- (iv) Address the “perceived” higher risk profile of climate resilient subprojects, from delays in approvals, land acquisition and resettlement; construction risk from new technologies; enabling regulatory and tax conditions; demand risk in operations; un-quantified co-benefits not translating into revenues; and, a lack of liquid capital market instruments; all constraining PIC flows;
- (v) Poor capacities to leverage sovereign funds through innovative finance structures; and
- (vi) Absence of clear definitions, guidelines and systems for climate / green finance.

With bankability and risk being fundamental constraints on large scale PIC financing, the Programme’s mixed finance approach supports this PRC vision. Financial institutions and capital markets in the PRC have continued to grow rapidly to support economic growth. The banking sector, with total assets equal to more than three times the country’s Gross Domestic Product (GDP), is now one of the largest in the world. Capital markets, starting from a much lower base than the banking sector, have stock market capitalization and total local currency bonds outstanding each equivalent to about two-thirds of GDP. While most savings continue to flow into the banking sector, ongoing reforms have supported growth in contractual savings. Insurance company assets now exceed 20% of GDP, reflecting real growth of more than 40% over the last 4 years. There are more than 4,000 social insurance funds administered by governments and state-owned enterprises, which traditionally have invested in bank accounts. Management of some of the larger funds is being passed to National Social Security Fund, which adopted investment policies more suitable for the long-term obligations of these social insurance funds. Enterprise annuities have grown modestly since inception. Mutual funds have grown four-fold over the last 3 years and are now equivalent to more than 12% of GDP.

PRC Financial and Capital Markets Overview, 2016

	Number	Assets (CNY billion)	Assets (\$ billion)	Assets (% of GDP)
Banks	1,088	232,300	33,424	312.2
Insurance companies	194	15,117	2,175	20.3
Pension and social insurance funds				
National Social Security Fund	1	1,900	293	2.6
Enterprise annuities		980	141	1.3
Mutual funds	3564	9,160	1,317	12.4
Stock Market: Listed companies (market capitalization)	3,052	50,879	7,320	68.4
Government debt securities outstanding		34,825	5,010	46.8
Of which, local currency		34,545	4,970	46.4
foreign currency		280	40	0.4
Corporate debt securities outstanding		18,285	2,631	24.6
Of which, local currency		14,964	2,153	20.1
foreign currency		3,320	477	4.5

Notes: Data as of end-2016 except number of banks, number of insurance companies, and National Social Security Fund, end-2015. Number of banks at end-2015 comprised 3 policy banks, 5 large commercial banks, 12 joint stock commercial banks, 133 city commercial banks, 5 private banks, 859 rural commercial banks and 71 rural cooperative banks. Exchange rate end-2016 (\$1 = CNY6.95), end-2015 (\$1 = CNY6.49); GDP end-2015 (CNY72,608 billion), end-2016 (CNY74,412 billion). Sources: Asset Management Association of China, CEIC Data, *China Daily*, China Banking Regulatory Commission, Economist Intelligence Unit, *AsianBondsOnline*, Willis Towers Watson *Global Pension Assets Study 2017*.

The concept for the Programme developed by ADB (footnote 1) is being piloted for the first time in Shandong Province. PIC finance is available for infrastructure through debt instruments (loans) to fund public private partnerships (PPP) but with a limited leverage ratio of 3. PIC finance is not specifically targeted to fund climate resilient subprojects beyond BAU through equity or debt. The Programme intends to address this financing gap.

C.1. Strategic Context

Policy Framework (National): The PRC plays a pivotal role in managing the CC challenge in the Asia-Pacific region, acting as a model for developing member countries (DMC) in their efforts to build their climate resilience, and scaling-up investments to support low GHG development pathways. The PRC doubled its urbanization ratio in the last 20 years to 57.4%.¹¹ in 2016 and has a target of 60%.¹² by 2020. Urbanization is a cornerstone of the structural reform of the economy, which is to reduce poverty and to transition to a more productive and service-based economic structure. Given the current level of GHG emissions,¹³ there is a vast need for very large climate related investments going beyond BAU to underpin its development targets. The PRC is initiating systemic interventions to generate transformational and advanced benefits CC mitigation subprojects, both with high efficiency and with accelerating emissions reductions at a low cost per ton. BAU technology solutions in the PRC could be considered transformative in many DMCs, such as the transport sector using high speed trains with transport-oriented development policies for intermodal connectivity including last mile with bicycles sharing; increasing usage of disruptive digital payment for urban services; and renewable energy production. Urbanization however has continued to add GHG emissions and effective action towards CC mitigation is critical to achieve regional and global reduction targets. Given the PRC's level of vulnerability to CC, in general and in Shandong, in particular, piloting an effective adaptation financing mechanism, dovetailing with the PRC's own initiatives addressing climate impacts, within the Programme, benefits tens of millions of people and avoid billions of dollars of economic costs (estimated up to 3.5% of GDP lost). The Programme also demonstrates transformative, advanced technology options and an innovative and disruptive financing model that can contribute to achieving sustainable development while achieving climate commitments.

Under the 13th Five Year Plan¹⁴, the PRC actively promotes a paradigm shift from GDP-oriented development to a development model centered on quality of growth. To support this modal shift and the massive investments required, the PRC has, over the past 10 years, launched several strategic initiatives on CC that build the foundations for strong supporting policies and regulatory frameworks. The *13th Five-Year Plan for Controlling Greenhouse Gas Emissions* has specific tasks to control GHG emissions by 2020 in the PRC; and set forth intermediary measurable emission control goals binding at the provincial and local government levels. The associated policy, the *National Plan for Combating Climate Change (2014-2020)*, makes addressing climate change a major national strategy and requires integrating the requirements for mitigation and adaptation into the country's economic and social development.

Recently, the PRC announced new CO₂ emission reduction targets, demonstrating exceptional leadership by President Xi Jinping, before signing the Paris Agreement¹⁵ at the COP-21 in Paris. The Intended Nationally Determined Contributions (INDC) details PRC's commitment to climate change actions by 2030:

- To achieve the peaking of emissions around 2030 and making best efforts to peak early;
- To lower carbon dioxide emissions per unit of GDP by 60% to 65% from 2005 level;
- To increase the share of non-fossil fuels in primary energy consumption to around 20%; and
- To increase the forest stock volume by around 4.5 billion cubic meters over 2005 levels; and
- To proactively adapt to climate change by enhancing mechanisms and capacities to effectively defend against climate change risks in key areas such as agriculture, forestry and water resources, as well as urban, coastal, and ecologically vulnerable areas; to progressively strengthen early warning and emergency response systems and disaster prevention and reduction mechanisms.

Plans for a green bond market were announced in 2013 as part of meeting the objectives of the 12th Five Year Plan to transition to a low-carbon economy. Following the promulgation of the country's *Green Bond Guidelines and Eligible*

¹¹ www.stats.gov.cn/zjtj/ztfx/18fzcyj/201802/P020180212522810538207.pdf

¹² http://ghs.ndrc.gov.cn/zttp/xxczhjs/ghzc/201605/t20160505_800839.html

¹³ In 2016, PRC was the largest GHG emitter worldwide accounting for just under 1/3 of global emissions (10,151 MtC PRC vs. 36,183 MtC Global). The Global Climate Risk Index ranks the PRC as the 12th most affected country by extreme weather events and estimates financial losses amounting to \$82 billion in 2016.

¹⁴ Government of the PRC, State Council. 2015. *The Thirteenth Five-Year Plan for National Economic and Social Development*. Beijing

¹⁵ United Nations. 2016. *Paris Agreement*. Paris: United Nations.

Project Catalogue, the PRC became the largest issuer of green bonds and represented a third of global green bonds.¹⁶ In 2016, the PRC assumed the G20 presidency and led to a first ever communiqué on Green Finance as a critical measure to support global sustainable growth. The same year, the State Council approved the *Guideline for Establishing the Green Financial system* to incentivize and promote green loans, green bonds, green funds, green insurance, and mandatory environmental information disclosure, among others. In 2017, the PRC launched the national carbon trading scheme, the world's largest carbon market that initially accounts for more than a third of the country's total CO₂ emissions per year.

ADB's country partnership strategy 2016-2020¹⁷ facilitates the government's reform agenda of "managing climate change and the environment". Investments under the Programme also contribute to several Sustainable Development Goals (SDGs), namely SDG 9, "Industry, Innovation and Infrastructure" building climate resilient infrastructure and fostering new climate finance models innovation; SDG 11 "Sustainable Cities and Communities" making cities and communities more resilient, safe, inclusive and sustainable; and, SDG 13 "Climate Action" taking urgent actions to promote climate related investments to combat the impacts of climate change. In particular, the Programme fosters a strategy of low-carbon infrastructure and industrial development, addressing the challenges posed by rapid urbanization, and upscaling action to meet the more ambitious goals of 'ecological civilization'¹⁸.

Context (Regional): Shandong is ranked the 8th Province in terms of provincial gross domestic product (GDP) per capita, and the provincial capital, Jinan, ranks 21 out of 34 PRC capitals in GDP. Shandong has a large labor reservoir for migrants who are moving to urban areas to take advantage of extensive industrial investment. But this development is facing multiple climate vulnerabilities that include climate impacted water resources as a lead limiting factor for growth at the core of the water – food – energy nexus. Industrial development is strong and targeted for industrial transformation to support CC adaptation and mitigation policies of the Province. In 2017, Jinan was ranked as the most congested city in the PRC. ADB will assist SGDF to develop a roadmap to raise PIC funding at the subproject level, using concessional funds (up to 50% of project cost at five to ten year tenor) as a catalyst.

SGDF will focus on:

- Defining aggressive and time-bound CC indicators of performance against GCF Investment Framework and sector specific transformational and advanced benefits' indicators to target better land use, water usage, sustainable and low impact urban development and urban livability;
- Developing a strong pipeline of bankable climate subprojects with at least 25% transformational and 50% advanced benefits in renewable power generation, urban transport, water supply, sanitation, sponge cities and drainage, solid waste, recycling and waste-to-energy and information communication technology for smart cities to reduce water and carbon footprints and addressing the water – food – energy nexus at the core of its vulnerability;
- Establishing a financing framework to incentivize such climate subprojects to explicitly crowd in: (i) PIC finance into the CC subprojects; and, (ii) advanced technology to maximize environmental impacts and benefits to the population, including gender and vulnerable people; and
- Creating M&E, reporting and verification systems on climate and financial indicators, based on climate investment eligibility criteria, to measure climate impacts.

Shandong Province was selected as pilot for the Programme given its track record of focused efforts on climate issues¹⁹ and because the Province is challenged by high GHG emissions deriving from its history of rapid industrial development²⁰. Regional low-carbon development is an important way to control GHG emissions. All provinces are required to incorporate a carbon intensity reduction goal into their economic and social development plans and annual plans. Shandong Province is required to reduce its CO₂ emission intensity by 20.5% by 2020, which is the toughest goal set at the provincial level. Under such pressure to reduce carbon intensity, Shandong is shifting from high-speed growth to high-quality development, and is in a critical period of transforming its development patterns, optimizing economic structure and transforming growth momentum. Shandong is a province with a large population (99.47 million in 2016) and with high contributions to overall national GDP growth. Acceleration of urbanization combined with tight resource and

¹⁶ Climate Bonds Initiative. 2016. *Bonds and Climate Change: The State of the Market in 2016*. London.

¹⁷ ADB. 2016. Country Partnership Strategy: *Transforming Partnership: People's Republic of China and Asian Development Bank, 2016–2020*. Manila.

¹⁸ Harmony between human and nature resulting in a low carbon economy

¹⁹ Shandong has established an RMB 50 billion New Industry Development Guidance Fund see www.mof.gov.cn/xinwenlianbo/shandongcaizhengxinxilianbo/201701/t20170118_2522081.htm

²⁰ Shandong has the highest consumption of coal per capita/unit product in the PRC.

environmental constraints will pose threats to Shandong economic development and climate agendas. Shandong's economic structure is highly similar to that of the country and plays a vital role in the overall national development. The State Council has approved Shandong to become a pilot for action to shift to a low carbon and resilient growth paradigm. Meeting this paradigm shift and CC targets requires better access to climate finance to finance climate related subprojects going beyond BAU, which the Programme supports.

Shandong - Mitigation Policies: *Low Carbon Development Work Plan of Shandong Province (2017-2020)* is a detailed roadmap to reduce CO₂ emissions and meet carbon intensity goal[s] in Shandong Province. The Plan proposes that by 2020, the carbon emissions per unit of GDP will drop by 20.5% from the 2015 level. Shandong has set the goal for CO₂ emissions to peak around 2027, earlier than the national goal of around 2030. Specifically, the cities of Qingdao and Yantai strive to peak around 2020; Jinan and Weifang strive to peak around 2025 with specific peak timetables and roadmaps formulated. Shandong Province continues to promote industrial low-carbon upgrading through: structural adjustment; focus on high-carbon industries; and reducing excess production capacity. Meanwhile, as it intensifies energy-saving transformation from high-carbon industry to advanced, energy-saving low-carbon industry, advanced technologies are needed to upgrade the traditional heavy industries, such as cement and steel. In addition, Shandong proposed the action plan below for the energy structure adjustment and industrial transformation in a bid to control emissions and shape a provincial low-carbon development model going beyond BAU.

Increasing supply of renewable energy: Shandong is making great efforts to decarbonize its economy. The Province is accelerating the development and utilization of new energies: wind power, solar energy, biomass bioenergy, and geothermal energy. By 2020, the proportion of new energy and renewable energy consumption will double to 7%. Through planning and implementing key projects such as "Regional Energy Transformation Demonstration Project", "Distributed Renewable Energy Demonstration Project" and "New Energy Microgrid Application and Demonstration Project", Shandong Province continues to increase its supply of clean energy, shift energy development patterns and boost the rapid development of renewable energy.

Key Indicators for Renewable Energy				
Energy Utilization	Utilization Scale			Unit
	2015	2020	2030	
Electricity Production	1,116	2,740	6,090	10,000 kW
Grid-connected wind power	722	1,400	2,300	
Solar	133	1,000	2,500	
Biomass	153	230	500	
Hydro	108	110	790	
Heat Supply (Cooling)				
Solar heat utilization	10,000	14,000	22,000	
Geothermal energy	5,700	14,000	30,000	
Fuel				10,000 tons
Biomass briquettes	50	150	300	
Ethanol for motor vehicles	120	120	120	
Total utilization	1,103	3,349	5,426	10,000 tons standard coal

Strengthening Energy Conservation: Centering on key areas, including high-efficiency boilers, motors, distribution transformers, lighting products, comprehensive utilization equipment, new energy transportation tools, atmospheric treatment and water treatment, Shandong Province looks to vigorously upgrade energy-saving and promote the industrialization of energy-saving transformation. Related provincial initiatives include planning to implement special park recycling reconstruction and green factory creation subprojects.

Promoting Low-carbon Buildings: Shandong intends to establish a lifecycle management model for green buildings; to implement green building standards for all green buildings; and develop prefabricated concrete slabs and steel structure buildings. By 2020, the green building design standards will be fully implemented within the scope of urban planning.

Newly added, fully green buildings will be over 200 million square meters, and the proportion of two-star or above green buildings will be over 30%. The proportion of prefabricated building materials used in new buildings in both Jinan and Qingdao will exceed 50%. The newly built energy-saving buildings will exceed 400 million square meters. Over 30 million square meters of existing residential buildings with energy saving retrofits and over 10 million square meters in public building energy-saving retrofits will be completed.

Establishing Low-carbon Transportation: Shandong is setting up an urban climate resilient transportation system and speeding up the construction of a modern integrated transportation system with “zero-distance transfer” for passenger transport; and “seamless connection” for freight transport based on low-carbon infrastructure. The Province continues to promote the construction of non-stop electronic toll collection and service system on expressways; steadily promotes the construction of charging stations and charging poles in expressway service areas; develops intelligent traffic capabilities; encourages the use of rental agency modes to encourage clean energy transportation equipment; innovate networking transportation; and other efficient transport organization modes, including hydrogen cells for mobility and solar roads;

Shandong - Adaptation Policies: Shandong’s *Implementation Plan for Accelerating the Ecological Civilization Construction* proposes active measures CC adaptation. Efforts will be made to implement construction subprojects to adapt to CC; improve the adaptability of urban and rural construction; and key fields such as infrastructure, water resources, agriculture, marine, meteorology, and public health. Additional efforts will include: strengthen assessment of impact of CC; improve the capacities to respond to CC, especially extreme weather and climate events; and minimize the adverse effects of CC on economic and social development. Shandong’s ‘Addressing Climate Change of Shandong Province (2013-2020)’ further lays out key tasks in infrastructure, water, agriculture and coastal protection as follows:

Infrastructure: Improve urban and rural development adaptability. Integrate low-carbon concepts into urban planning, such as low impact development and construction with CC factors fully considered. Strengthen the construction of urban lifeline systems such as water supply and drainage, heating, power supply, gas supply, and communications, and strengthen risk assessments for safe operations, and improve adaptation capabilities. Strengthen the risk assessment of major transport facilities to adapt to CC, improve design and construction standards for transportation facilities such as roads, railways, airports, ports, and optimize the site selection plan and route design. Comprehensively strengthen the planning, at the same, construction and management of urban underground comprehensive pipe corridors is encouraged.

Water Resource: Further protect water resources through water quality improvement, control underground water over-exploration and prevent sea water erosion. Utilize various water resources by expanding capacity of reservoirs, rainwater and flood water utilization, sewage treatment and reclaimed water reuse, seawater desalination and direct utilization. Implement water-saving and water conservancy subprojects and strengthen the use of high-standard water-saving technologies such as agricultural sprinkler irrigation, drip irrigation, and micro-irrigation, and focus on building a number of highly efficient water-saving demonstration zones.

Agriculture: Increase crops adaptive capacity through farmland water conservancy facilities, fertile soil engineering and conservation tillage as well as well-facilitated farmland.

Coastal Protection: Strengthen the integrated management of coastal zones. Implement coastal rehabilitation with 95% shoreline damaged by constructing high-standard shoreline breakwater embankments and seawall breakwater embankments; over 1,400 kilometers of new and improved breakwaters are already built and upgraded. Shandong can now concentrate on the construction of important ecological function protection areas and seawall highways and wetlands, and strengthen the establishment of coastal basal forest belts, protective forests, and wave-removing (purification) forest belts to build a coastal ecological corridor. Focusing on traditional ecosystems and important fishery waters at estuaries and bays such as the Yellow River Estuary, Laizhou Bay, and Jiaozhou Bay, Shandong is carrying out coastal wetland protection and restoration subprojects and shoreline restoration subprojects with a target of over 40% for the province's natural coastline retention rate by 2020.

Priority Investments: SGDF investment priorities are determined from the climate analysis and assessment of sectors where financing mechanisms can have most impact²¹. In respect of mitigation sectors, the priorities are: renewable energy including wind, solar, biomass and geothermal etc. addressing the main source of GHG emissions, the power sector; green (energy efficient) buildings and heating / cooling systems as the second most important source of emissions; low carbon transport, supporting new energy vehicles, bus rapid transit green corridors and urban slow-moving systems,

²¹ Annex 14.2

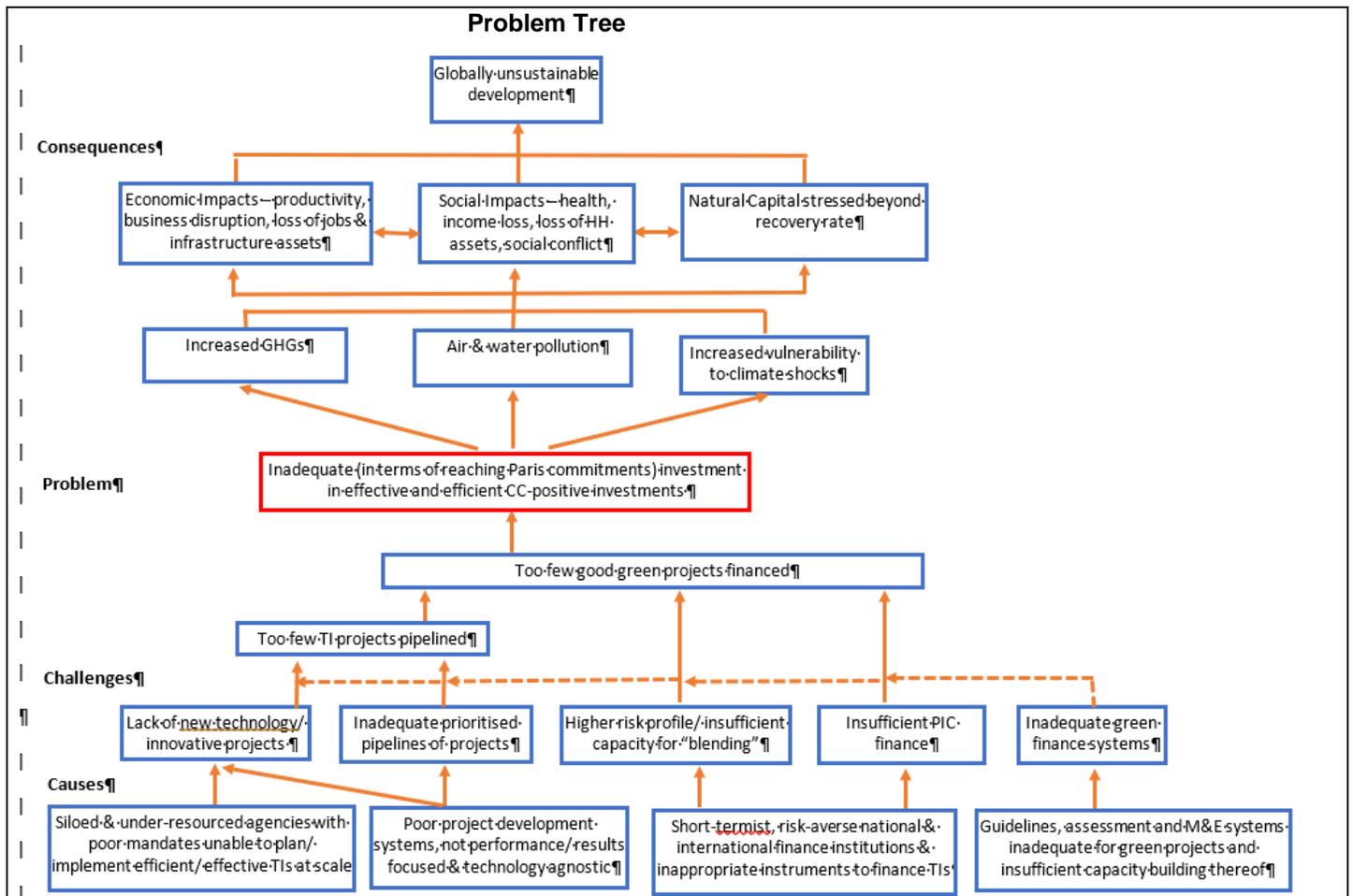
addressing the third most important and rapidly growing sector. Based on Provincial modelling of climate vulnerabilities, the adaptation priorities are: agricultural and urban water supply infrastructure; city flood resilience infrastructure (sponge cities and low impact development), including flood proofing urban lifeline systems such as water supply, drainage, power supply and communications; city greening and coastal protection.

In terms of the portfolio composition, mitigation priorities are determined by the level of CO₂ emissions produced annually and adaptation priorities by the numbers of people at risk from adverse effects disaggregating numbers by sex and vulnerable portion of the population (see Annex 9). More sophisticated assessments of adaptation-related risks that would be a better basis for determining priorities are theoretically possible, but with current models and data attempting to utilize these would involve making detailed assumptions with high degrees of uncertainty. In accordance with GCF policy, the recommendations of stakeholder focus groups assessing the relative subjective priority of attaining mitigation co-benefits (pollution reduction) and adaptation-related risks, a target allocation of 25% was established for adaptation investments. The resultant target portfolio allocation is shown in the following table.

Portfolio Weights					
Mitigation Sector	Carbon Emissions CO ₂ e Mtonnes	Percent	Adaptation Sector	Potential Beneficiaries Millions	Percent
Power	420.3936	51.22%	Flooding	8.2	5.91%
Green Building	105.2568	12.82%	Drought	6.9	4.97%
Transportation	51.4817	6.27%	Coast	14.4	10.37%
EE	38.4568	4.69%	Heat/ Greening	5.2	3.75%
Check totals		0.75			0.25

EE = Energy Efficiency

The Programme design responds directly to the problem tree hereinafter, in which these challenges manifest. The base causes identified are: the lack of effective project development and structuring capacity (specifically for crowding in PIC finance), the inflexibility and cost of financing systems, and insufficiently rigorous and untargeted green financing systems. These are specifically addressed by elements of the Programme.



Based on the Theory of Change (see Section C.2) which responds to the key causes identified in the above analysis, the Province is establishing SGDF, based on ADB’s climate finance principles (footnote 1), to facilitate Shandong’s transition to a lower-carbon future, but remains constrained by its ability to finance the scale of investment required on the part of both the public and private sectors. SGDF needs to both encourage the development of climate-positive subprojects and leverage its public funds to address the scale of the challenge. The objective is to tap new funding sources and leverage existing sources of finance into a pipeline of viable CC investments by:

- Ensuring that SGDF addresses priority climate impacts and vulnerabilities in Shandong;
- Incorporating a project preparation facility to develop a pipeline of Transformational and Advanced Benefit, sustainable and replicable subprojects based on high levels of performance on criteria reflecting the GCF Investment Framework; and
- Incorporating structures for leverage of PIC finance:
 - facilitating the participation of pension, social security and insurance funds;
 - using a mixed finance approach to extend existing financing mechanisms;
 - reducing project risk, by better project development and providing longer term lower cost funds;
 - fostering capital market access and participation – with, for example, a roadmap to raise additional climate finance after the construction and establishment stage; and
 - establishing clear definitions, guidelines and systems for climate finance following international best practices to ensure transformational change.

Relevance: The Programme extends a long-term engagement between ADB and PRC to finance a new generation of climate resilient, low GHG emissions subprojects with higher risk profiles and going beyond BAU, as defined under the assessment process in Annex 9. Such subprojects, up to now, have usually either relied exclusively on long-term sovereign funding or have stopped because of the public funding gap. From 2011 to 2016, ADB provided \$2.88 billion of

climate financing from its own resources to the PRC, of which mitigation financing constituted \$2.07 billion. This represented 17% of ADB's total climate financing for the period. Estimates for 2017 show that out of \$4.5 billion in total climate financing, ADB invested \$1.1 billion to mitigate GHG emission reductions in the PRC. ADB's PRC funded climate related subprojects in the energy sector approved in 2017 alone will result in annual GHG emissions reductions of 12 Million tons carbon dioxide equivalent (CO₂eq). ADB intends to increasingly utilize its funding to the PRC to support its efforts to expand its climate finance initiatives and to make them more effective at addressing both climate and pollution challenges.

The use of ADB (and co-financiers) catalytic finance combined with a high level of national co-financing channeled through a Financial Intermediary (FI) is particularly well suited to support PRC's climate investments needs with a wide range of interventions targeting:

- Robust strategic roadmap – tailored to Shandong's progressive CC policies for mainstreaming climate finance;
- Strong policy reforms and incentives through involvement in project formulation and through lending conditions covenanted in debt agreements;
- Flexible financing instruments that can evolve with phased policy changes;
- Improved support to local governments developing climate related subproject pipelines compliant with the GCF Investment Framework, bolstering market and sponsor readiness; and,
- Building confidence of PIC investors thus increasing i financing flows from PIC sources.

In this context, the Programme operates in an already established and rapidly evolving system of climate finance in the PRC. ADB is involved in several financing initiatives relating to investments in specific environment-related sectors including: Air Quality Improvement in the Greater Beijing - Tianjin - Hebei Region; Low Carbon City Program; and Yangtze River Economic Belt Framework. Based on these experiences and in partnership with PRC agencies, the Programme is designed to have a catalytic, qualitatively different role in relation to climate finance that will be complimentary to other facilities and institutions.

C.2. Programme Objective against Baseline

The Programme moves investment beyond the traditional "Green" and BAU to transformative Climate Finance, potentially crowding-in initially at the Fund level, \$1 billion of public and private funding from \$500 million catalytic funding from IFIs, including GCF. Shandong Province is the top ranked PRC Province for coal and energy consumption and has approved policies on coal substitution through low carbon economy and industrial transformation. This transformational change requires the Province to initiate the necessary climate related investments to support the new policies of the Shandong Provincial Government (refer to Section C1.). SGDF addresses the financing gap and specifically the limited appetite from the private sector for higher risk climate related subprojects. The private sector is expected to deliver advanced technologies required to meet CO₂ emission reduction targets for CC mitigation and beneficiaries from CC adaptation subprojects.

The Programme has the following financial impact on climate finance:

- The Programme is structured to have a multiplier / catalyst effect on PIC funds going into climate related infrastructure subprojects and businesses; and
- Every dollar of catalytic donors' funds through SGDF directly crowds-in PIC funds at the beginning of the subproject and progressively as catalyst funding exits commencing after 5 years, representing a final leveraging ratio over 5.

The Programme's direct impacts includes the piloting the GFCF model for mixed financing of bankable climate subprojects through SGDF, with enhanced CC resilience of subprojects and improved incentives and support to access to CC advanced technologies to maximize climate benefits. Follow-on anticipated impacts may include upscaling the Programme at national level and in other countries through ADB's GFCF (footnote 1) first targeting in 2019 – 2022: Indonesia, Malaysia, Mongolia, Philippines, Thailand. The Green Finance Catalyzing Facility will eventually mainstream access to capital markets through securitization as well as a carbon trading scheme to further crowd in climate finance and ease liquidity, further increasing the leverage ratio.

The Provincial vulnerability assessment²² prioritizes mitigation investments and demonstrates a direct link between industrial activities, GHG emissions and environmental pollution. Shandong relies heavily on its energy and industrial outputs which are also responsible for the large GHG emissions. According to “Shandong 2013-2020 Air Pollution Prevention and Control Plan”, the coal consumption in the Province reached 380 million tons in 2011, accounting for about 1/10 of the national total and 1/20 of the world. The Shandong GHG profile²³ is estimated and compiled based on official statistical data available, and the profile preparation method is published by the National Development and Reform Commission (NDRC). The Province’s GHG profile shows energy consumption and production activities produced a total of 952 million tons CO₂eq (including converted methane emissions), representing about 69% of total emissions. Industrial production process generated 412 million tons CO₂eq (<30%) and agricultural production 17 million tons CO₂eq (1.2%, converted from methane emissions). Fossil fuel consumed in Shandong²⁴ (2016) is 96.5% of the total energy consumption (coal = 77%; petrol = 16%; natural gas > 3%) and solar about 3.5%. In the same year, the total energy production was dominated by coal (72.7%) followed by oil (23.4%) and natural gas (0.4%) with renewables (solar, wind, hydro) contributing only 1.7% of the total.

As a result, the provincial government introduced policies for coal substitution, industrial transformation, including phasing out coal-fired power plants. Shandong sets the objective to increase the proportion of renewable energy for consumption to double to 7% and installed capacity for production 30 million kilowatts by 2020:

- Wind: In 2015, installed capacity was 7.2 million kilowatts targeted to increase to double by 2020 with an expected investment requirement over RMB50 billion (\$7.8 billion);
- Solar: In 2015, installed capacity was less than 1.3 million kilowatts planned to reach 10 million kilowatts by 2020;
- Biomass: By 2020, the installed capacity of waste power generation and biogas power generation from agriculture and forest would reach 2.3 million kilowatts.
- Geothermal: In 2015, shallow geothermal energy heating/cooling area was 30 million m² supplemented by another 27 million m² for geothermal heating. By 2020, geothermal energy heating/cooling would reach 140 million m².

SGDF Theory of Change

In summary, the context of the Programme is that:

Given: Trillions of dollars of climate-related urban and other climate investment are needed in China;

And that: Many cities are near their borrowing limits and cannot raise sufficient additional financing for required investment under current structures and cannot develop projects structured to tap other sources of finance; national and provincial governments are limited in their ability to raise taxes for transfers to cities; and traditional sovereign financing and banking systems have little incentive to cater to CC investment needs.

Despite: Cities having the bulk of the economy; and citizens having shown themselves willing to pay more for better services and cleaner environment.

A new paradigm is needed to: Unlock significant sub-sovereign finance for cities (especially from the private, institutional and commercial sector).

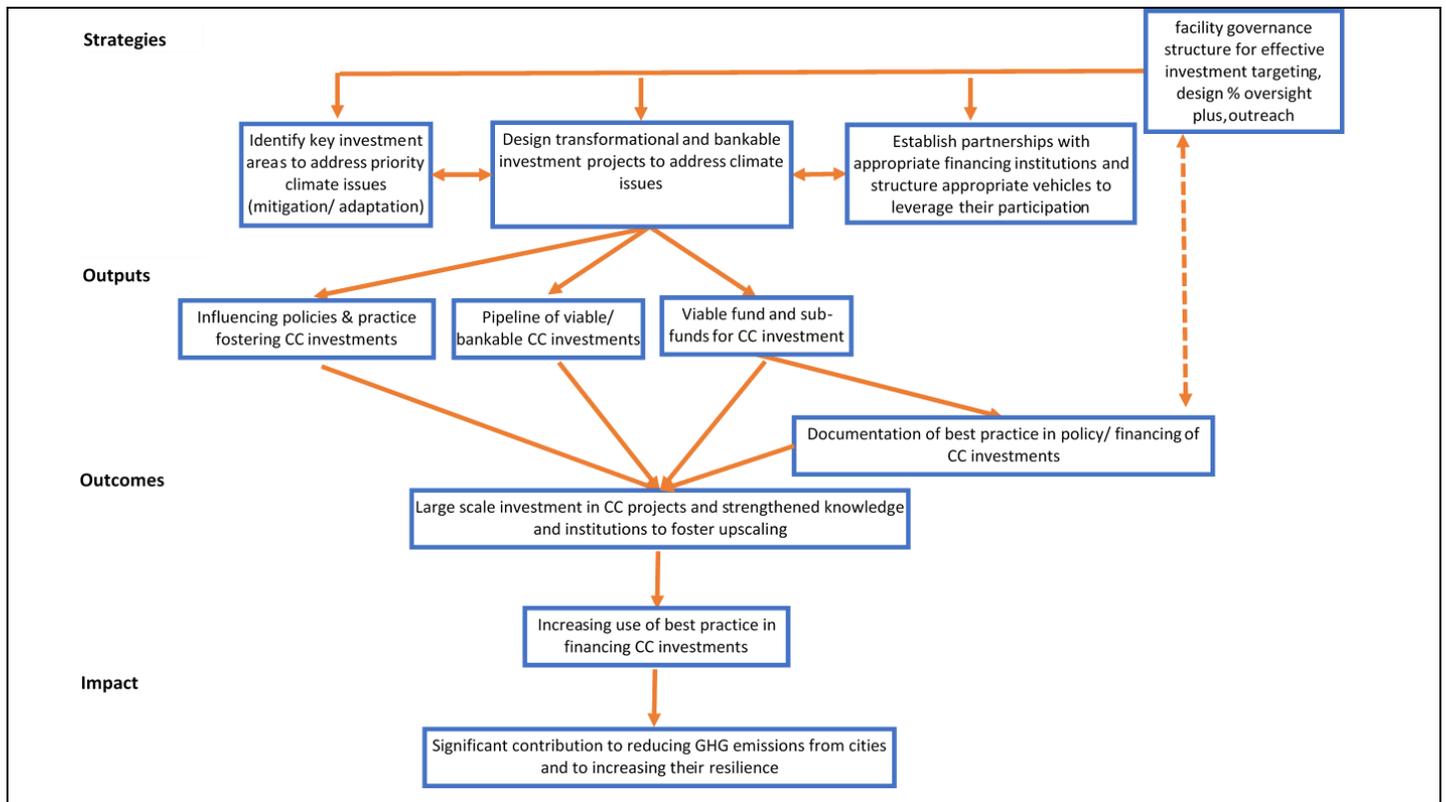
Such a paradigm involves developing mechanisms which address key structural impediments to realizing this goal by: Prioritizing investments to address key CC impacts and vulnerabilities; developing a pipeline of transformative and bankable CC projects – establishing or strengthening companies and institutions; and facilitating the flow of PIC infrastructure investment finance to cities and CC projects – strengthening the capacity of financing institutions to do sub-sovereign climate finance.

The objective is thus to tap new sources for, and leverage existing sources of, finance into a pipeline of viable CC investments.

²² The methodology for preparing GHG profiles adopted in China is consistent with the IPCC guidelines covering energy activities, industrial processes, agricultural GHG, waste GHG, land-use change and forestry.

²³ ADB project team estimates. GHG profile does not include solid waste due to lack of data; land use also not considered because of limited GHG contribution.

²⁴ Based on the consumption by energy types *Shandong Statistical Yearbook*. 2016.



The needed mechanisms are provided under the subproject's 4 components: mixed financing; project development; capacity building and knowledge development; and policy support. The following section sets out how these components work together to address the constraints to PIC finance of climate subprojects.

SGDF components in operation

Based on the climate analysis in Annex 14.2, ADB has reviewed a broad cross-section of potential subprojects that address the priority investment sectors identified through the climate assessment process – in clean energy and in energy efficiency relating to buildings and transport in particular. Across the Province, enterprises and cities are developing climate positive subprojects that are commercially viable in the long term and at scale (see PFS reports). However, the universal response to the question asked to all subproject sponsors – Why can't this subproject be financed from existing financing sources? – is that financing of the tenor required and at a cost that reflects the long term returns of the project is not available from local financial and capital markets (PIC finance). This finding is in line with other studies on the long term investment financing China – for example by the Canada Pension Plan Investment Board, Hillhouse Capital Group and Caixin Global Intelligence & Caixin Media (see <https://www.cppib.com/en/public-media/headlines/2017/chinese-companies-longer-term-strategies/>).

Further, ADB scoping determined that there was a wide variability in the understanding of 'green' among the subproject proponents. The Chinese focus is on pollution benefits. It became increasingly apparent that subproject proponents would need considerable technical assistance if a full recognition of the need, and a clear understanding of the technical options, to minimize GHG emissions and maximize climate resilience. The SGDF responds to these findings by providing mixed finance for long term investments, including a project preparation facility to support subproject proponents, and providing an assessment structure that establishes a benchmark and incentives for transformational climate-positive subprojects.

The Diagram below shows how the Programme was designed to respond to the TOC analysis and the results of the assessment of the Provincial institutional and climate context. The key assumptions and identified risks are also shown.

Programme-Structure:Components-Responding-to-Key-Problems-Theory-of-Change-Strategies—with-Assumptions-/Risks¶

Key-Problems¶	Strategies-/Implementing-Components¶	Activities¶	Outputs¶	Outcomes¶	Impact¶
Siloed-and-under-resourced-implementation-agencies¶	New, multi-sectoral-catalyst-green-finance-institution¶ → → Component-1¶	Establish-the-Shandong-Green-Development-Fund-(SGDF)-with-capacity-too-structure-and-provide-appropriate-finance-for-green-projects-which-will-also-crowd-in-PIC-finance—undertake-financing-of-green-projects¶	Increased-number-of-projects-accessing-appropriate-mitigation-financing-¶	Increased-number-of-climate-mitigation-projects-implemented-¶	Significant-reduction-in-priority-carbon-emissions¶
Short-term-and-risk-averse-financial-sectors¶	New-institution-partners-with-traditional-financial-sector-institutions-to-lengthen-tenor-and-reduce-perceived-risk¶ → → Component-1¶		Increased-number-of-projects-accessing-appropriate-adaptation-financing-¶	Increased-number-of-climate-adaptation-projects-implemented-¶	Significant-reduction-in-people-and-assets/infrastructure-vulnerable-to-climate-impacts¶
Poor-project-development-systems-for-green-projects¶	Institution-needs-to-include-a-project-development-facility¶ → → Component-2¶	Provision-of-TA-to-support-the-SGDF-in-the-establishment-of-a-financially-sustainable-project-development-facility¶	A-sustainable-financial-project-development-facility-mechanism-¶	Strengthened-capacity-to-support-the-development-of-projects-on-a-sustainable-basis¶	
Poor-policy-and-capacity-regarding-formulation-and-financing-of-green-projects¶	Build-capacity-in-green-guidelines, M&E, Green-rating¶ → → Component-3¶	Building-capacity-for-supporting-the-formulation, assessment-and-structuring-of-green-projects¶ (Sub-component-3.1)¶	Trainings-and-guidelines-for-Fund-operation-¶	Successful-capacity-development-&-training-strengthens-SGDF-capacity-to-undertake-green-financing¶	Strengthened-institutional-and-regulatory-systems-for-Green-Finance¶
		Provision-of-TA-to-strengthen-M&E-systems-compatibility-with-monitoring-and-reporting-on-green-projects¶ (Sub-component-3.2)¶	Operational-M&E-system-for-SGDF-appropriate-for-all-stakeholders/-funders¶	Availability-of-and-access-to-timely, relevant-and-accurate-information-on-green-project-portfolio-by-stakeholder¶	
		Provision-of-TA-to-develop-a-Green-rating-system-appropriate-for-use-by-such-funds-as-the-SGDF-to-facilitate-increasing-the-scope-of-financing-and-ease-of-refinancing¶ (Sub-component-3.3)¶	Operational-Green-Rating-System¶	Internationally-recognised-Green-rating-system-successfully-established-and-used-by-SGDF-to-leverage-PIC-finance¶	
	Support-better-policy-development-and-outreach¶ → → Component-4¶	Provision-of-TA-supporting-the-development-of-policy-facilitating-PIC-finance-of-green-projects-and-its-dissemination/-implementation¶	workshops+policy-papers-to-inform-provincial-Plans¶	Effective-Policy-Reform-supported-and-included-in-Provincial-Plans¶	
Assumptions¶	These-strategies-are-sufficient-to-catalyse-sufficient-institutional-change-in-financing-structures-so-proposed-impacts-can-be-realised-¶	Commitment-of-Province-and-SDG-to-green-finance-is-maintained-and-above-activities-are-supported-in-implementation. ¶ ¶ ¶ ¶	Financial-and-operational-wells-are-managed-well-to-maximise-disbursement-and-operational-effectiveness¶ ¶ TA-is-managed-effectively-and-outputs-are-used-proactively¶	Projects-meet-their-intended-climate-outputs-¶ ¶ TA-component-is-fully-funded-and-effective¶ ¶ Management-uses-systems-provided-effectively¶	Over-30-years:-Most-invested-projects-operate-for-25-years,-excluding-5-years-for-approval-and-construction-time. ¶ ¶ SGDF-over-time-will-reduce-cost-per-t.CO2eq. ¶ ¶ Vulnerable/beneficiary-groups-and-women-are-effectively-targeted-and-disaggregated-in-reporting. ¶ ¶ Private-sector-to-invest-in-each-project-in-equal-or-greater-amounts-than-the-SGDF-investment.¶
Risks¶ (see-Section-G-for-detail)¶	¶ ¶ ¶	Political-/managerial-commitment-wanes¶	Management-of-support-TA-implementation-is-inadequate-or-TA-consultants-underperform¶	Management-of-financing-processes-is-inadequate-or-integration-of-new-systems-is-poor¶ ¶ Political-risk-in-relation-to-implementing-policy-reform¶	Impact-monitoring-is-sufficient-to-capture-breadth-of-impacts¶

Note:-For-the-purposes-of-the-table-a-green-project-is-one-undertaking-investments-in-climate-mitigation-and/or-adaptation.¶

C.3. Programme Description

The Programme creates an investment fund, SGDF, piloted in Shandong. The Programme links climate related investments to catalytic funding from IFIs under the measurable CC indicators of the GCF Investment Framework. The Programme pilots a framework for climate investment financing, providing a co-financing vehicle for PIC finance. The Programme finances a portfolio of climate related subprojects sponsored by local governments or the private sector through ring-fenced and special purpose vehicles with mandatory climate and environmental sustainability criteria (e.g. GHG reduction plus land, water, and air pollution indicators); and financial bankability indicators (e.g. financial IRR, debt service coverage ratio), conditional on PIC leverage ratio and transformational or advanced benefits categorization

against the GCF Investment Framework. No BAU subprojects can be financed by SGDF. The CC subprojects' pipeline spans several sub-sectors and focuses on maximizing investment in CC **mitigation (75%), resulting in a conservative estimate of 50 million tons CO₂eq** over the lifespan of the subprojects (25 years, excluding 5 years for approval and construction), and **adaptation (25%) with 10 million direct beneficiaries** (about 10% of Shandong Province), resulting from the climate vulnerability assessment (footnote 21) and summarized in Section C1. Infrastructure sectors assessments for PRC are included into Annex 10.

The concept of the Programme was presented at the Country Programming Mission between ADB and the government in September 2016. The concept was endorsed and included into the latest Country Operations Business Plan (COBP) 2018 -2020 for \$500 million catalytic finance, including \$100 million from ADB Ordinary Capital Resources (variable rate) and co-financing. ADB identified several commercial / policy banks and leading Provinces initiating local green development funds. Together with the government, ADB selected Shandong Province to develop SGDF as a climate finance vehicle primarily targeting subprojects going beyond BAU for decarbonization (coal substitution) using catalytic financing based on the principles of the Green Finance Catalyzing Facility (footnote 1).

ADB approved the Programme's concept paper for PRC in October 2017 with a preparation grant of \$975,000 co-financed by AFD (\$150,000) and the Government of Luxembourg (\$225,000) through ADB (ADB Budget: \$600,000).

To be eligible for SGDF financing, candidate climate related subprojects²⁵ must fulfill the following minimum criteria:

- Climate performance assessment, based on the investment framework of the GCF to achieve CC milestones/targets, and demonstrate transformational potential (Footnote 3);
- Financial indicators acceptable to subproject sponsors and financiers (refer to Financial Model in Annex 3); and,
- Transition of subproject bankability gap to achieve an internal rate of return (IRR) attractive to subproject sponsors and bidders but negotiable depending on sub-sectors and project risk assessment, with a minimum combined sponsor equity and debt of 50%.

The Programme provides the following for eligible subprojects:

- Funding 10 to 50% (may vary per sector and subproject risk profile) of capital expenditure (CAPEX) upfront for 5 to 10 years;
- Refinancing catalytic funding from year 5 to 10, with an exit strategy to replace with PIC finance at commercial rate through take-out financing or climate bond / ABS issuance; and,
- Accessing TA resources, to be funded by ADB loan and recovered from the subproject sponsors (through management fees) – for climate resilient subproject preparation and implementation to adopt advanced technologies and integrated approach towards greater CC impacts; climate/green and financial ratings; M&E and verification.

The Programme designs the key principles and linked conditions under which SGDF provides funding support to eligible subprojects with the objective of transitioning climate related subprojects to bankability. These principles include:

- Caps on SGDF lending to achieve minimum leveraging ratio per subproject (also sector specific and level of transformational vs. advanced benefits);
- Leveraging can be structured to increase in phases based on diminishing risk profile (approval; land acquisition / resettlement; construction; operation)
- Financial incentives for attracting advanced technology to subprojects enhancing linkages to CC targets with outputs / results and added environmental co-benefits;
- Revolving/takeout finance structure for catalytic SGDF mixed finance to be refinanced once risk period is over and recycled in the SGDF funding pool, further enhancing the leveraging ratio; and
- Roadmaps for subprojects to access capital markets to substitute catalytic funds with PIC financing.

Additional information on the investment strategy is included in Section B1; flow of funds and implementation arrangements in Section C7; and, the functioning of SGDF is summarized in the following diagram.

²⁵ A list of Transformational and Advanced Benefits projects' concepts under consideration for SGDF funding is included in Annex 12 with 3 Pre-Feasibility Studies summarized in Annex 2.

SGDF Transaction Cycle



SGDF intends to participate in up to 20% shares of sub-funds as cornerstone investors to further leverage PIC capital at sub-fund level. The sub-funds are expected to cover niche and new markets directly related to the climate vulnerability assessment for the sector funds and the three key cities in the Province.

Sub-Funds	Investee Fund Size (Million CNY)	SGDF Investment (Million CNY)	Climate Focus
Jinan Municipal Fund	500	100	Climate investment to support Jinan's early CO ₂ peaking around 2025
Qingdao Municipal Fund	500	100	Climate investment to support Qingdao's early CO ₂ peaking around 2020
Yantai Municipal Fund	500	100	Climate investment to support Yantai's early CO ₂ peaking around 2020
New Energy Fund	3,000	200	Value chain of new energy sector, such as new energy vehicles, low-carbon logistic, fuel switch, distributed solar and wind power, integrated urban renewable energy projects
Green Transport Fund	1,500	300	Rail transit equipment, public transportation such as urban light rails and new energy vehicles
Green Building Fund	2,000	400	Prefabricated green buildings and building energy efficiency
Green Engine Fund	2,000	400	Industrial transformation towards climate friendly industries
Green Technology Fund	2,000	400	High and green technology transfer to Shandong

As discussed above, all of these financings will benefit from the four components of the subproject:

- Direct application of mixed finance;
- Project development assistance to maximize the climate impact of the subproject;
- Knowledge support both feeding in international best practice to project design and documenting good practice; and
- Policy support in relation to facilitating administrative approvals and in upscaling.

As set out in Section C.2 above, the outcomes of the financing component will be the catalyst of climate positive investment through the successful financial structuring of subprojects that will reduce GHG emissions and mitigate climate

risks (the outputs). Activities in this component will focus on the effective structuring and operation of the SGDF itself (see Section C.8).

The outcomes of the project development component will be design of bankable climate subprojects through the funding of pre-feasibility and feasibility studies for selected high-potential subprojects (outputs). Activities will focus on the provision of technical assistance to support green design and financial structuring of subprojects.

The outcomes of the knowledge and capacity building component will be the institutional strengthening of SGDF itself but also of Provincial institutions and the enterprise systems of key subproject sponsors through the provision of training, M&E systems and Green Rating Systems (outputs). Activities will focus on the provision of technical assistance supporting SGDF to produce these outputs.

The outcomes of the policy component will be policy change produced as a result of policy papers, especially the next provincial low carbon development action plan after 2020, produced as outputs of three policy workshops. The activities of this component will thus consist of the providing the knowledge base for, structuring, undertaking and documenting the results of the three workshops.

The detailed activities under the components and sub-components are:

Component 1: Financing

SGDF will establish and staff SGDF core financial management team of experienced fund management personnel; enter into agreement with experienced GP to strengthen this core team; undertake assessment of subproject proposals under green criteria (compliant with the GCF Investment Framework) as needed and implement required financing structures; and undertake financing of subprojects assessed as qualifying and monitor compliance with SGDF covenants and requirements as discussed above.

Component 2: Project Development

The Design, Review and Advisory (DRA) TA package will: (i) review of subproject applications and feasibility studies; (ii) Green Assessment for subprojects using the Green Assessment Guideline (Annex 9); (iii) providing technical and sector expertise to subproject applicants and the FMC to increase subprojects' green rating, provide access to innovative technologies and green the supply chain; (iv) provide green procurement advice; and (v) provide the technical inputs to the ESMS, including gender action plan, needed for bi-annual and annual reporting. The DRA contract will be implemented over a period of 60 months. The midterm review in Year 3 will assess the need for further technical assistance beyond Year 5.

Component 3: Knowledge and Capacity Development

Sub-component 3.1: Capacity Development. TA consultants will support SGDF capacity development in relation to the identification and assessment of "green projects" compliant with the GCF Investment Framework, and options for financial structuring of such subprojects, in accordance with the definitions and processes of the GCF in particular.

Sub-component 3.2: Monitoring and Evaluation. A Monitoring, Evaluation and Verification (MEV) contractor will be procured to assist SGDF with the reporting requirements of ADB and other SGDF investors. The tasks of the contractor will be to: (i) prepare a workplan; and training programme for MEV; (ii) review subproject monitoring plans and monitoring reports; (iii) assist SGDF to prepare the semi-annual ADB reports and support SGDF staff in MEV processes; (iv) assist SGDF to prepare the Annual Performance Report (GCF Format); and (v) make recommendations on focus areas for improved performance given an analysis of MEV data.

Sub-component 3.3: Green Rating. A Green Rating system will be developed by a credible, internationally recognized, rating entity in order to: (i) demonstrate that Fund-financed subprojects are both a green (and compliant with the GCF Investment Framework) and a viable investment proposition; (ii) enhance transparency and facilitate an increase in the breadth of participation, the number of investors and quantum of investment in subprojects; and (iii) aggregate knowledge on subproject performance to improve the programming of the Fund, i.e. for project selection and for improving MEV of subprojects.

Component 4: Policy Development

A policy development consultant will work with SGDF to review subprojects developed and financed in order to derive lessons learned and best practice in the sectors concerned. The consultant will formulate recommendations on policy in relation to (i) dissemination of best practice in order to upscale and to increase the efficiency and effectiveness of likely subprojects; and (ii) mechanisms to overcome policy, administrative and financial constraints to increasing the efficiency

and effectiveness of climate investment in the sectors concerned. The consultant will design, organize and facilitate 3 workshops to promote policy reform in relation to the identified opportunities and constraints.

C.4. Background Information on Programme Sponsor (Executing Entity)

The executing entity (EE) for the Programme is SPG. SPG receives the loan proceeds from MOF (representing PRC) and maintains at the Shandong Finance Bureau a foreign currency account, SPG transfers the loan proceeds to SDIHG in local currency for investment as LP into SGDF.

SDIHG is a wholly state-owned enterprise of the SPG (40% owned by Shandong Provincial Development and Reform Commission; 30% by State-Owned Assets Supervision and Administration Commission of Shandong Province; 30% by Shandong Provincial Social Security and Pension Funds). SDIHG was incorporated under the laws and regulations of the PRC in 2015 from the infrastructure fund of Provincial Development and Reform Commission operating infrastructure investments since the late 1990's. As a state-owned investment platform, SDIHG's mandate is to support infrastructure development and implement the provincial government's industrial transformation policies. Its business scope includes investment and management, capital operation, asset management, trusteeship, and investment advisory services.

SDIHG has directly invested into diversified sectors including railways, power, airport, airline, green buildings, petrochemical, culture and media etc. It also successfully manages the following funds:

- Poverty Alleviation Fund (CNY570 million): Supporting poverty alleviation projects;
- Shandong Direct Investment Fund (CNY500 million): Investment into 169 small and medium-sized enterprises;
- Shandong Railway Development Fund (CNY3 billion): Financing construction and operation of railways including high speed railways in the Province;
- Jinan Industrial Investment Fund (CNY5 billion): Supporting regional infrastructure construction and emerging industry development; and
- Provincial Circle and Belt Fund (CNY1 billion): Supporting regional connectivity and integration in Shandong.

Organization. The company is well managed with an experienced senior management, qualified young professionals averaging 37 years old and a total of 100 employees. SDIHG departments include: Investment Development, Capital Operations, Asset Management, Audit and Legal Affairs, Human Resources, Accounting, and Administration. The Party committee, board of directors, and supervisory board provide strategic guidance and supervise the business activities.

Financial management. Results of the Financial Management Assessment shows that SDIHG has financial management systems in place and that financial management procedures are well implemented to facilitate proper financial management and reporting. The overall financial management environment of accounting, reporting and monitoring systems are sufficient to support implementation of multiple loan facilities from IFIs. Corporate governance risks are considered low with regards to accounting policies and procedures; staffing; reporting and monitoring; information systems; internal auditing; and external auditing.

Financial management system in place is summarized in Section F.4.

Capacity of SDIHG to implement the Programme is further detailed in Section E.5.2.

C.5. Market Overview (if applicable)

Not Applicable

C.6. Regulation, Taxation and Insurance (if applicable)

A condition of effectiveness of the IFIs loans is the provision of legal opinions by the government on the loan and project agreements.

SGDF does not pay any taxes; however, the LP, including SDIHG are paying corporate taxes taking into consideration profit/loss returns from SGDF.

SGDF, represented by the FMC needs to register with the Asset Management Association of China to operate legally in the PRC. In 2018, the China Insurance Regulatory Commission merged with the China Banking Regulatory Commission to constitute the regulator in the PRC of the banking and insurance systems in general and investment funds, such as SGDF in particular.

C.7. Institutional / Implementation Arrangements

The subprojects financed by SGDF will be implemented by their sponsors based on the terms and conditions of investment agreements with the fund or participating subfund. All subproject companies will be required to sign a project implementing agreement (which may be combined with in the financial investment agreement or separate) which requires them to use the investment proceeds exclusively to pursue a complying subproject and to implement the project in full compliance with all Programme requirements, including those set out in Programme's project agreement and project administration manual (PAM) which includes the ESMS, and gender action plan.

ADB will sign an ADB Loan Agreement and GCF Loan Agreement with PRC, which will obligate PRC to ensure, through SPG, that the programme is implemented in compliance with the project's Project Agreement and PAM. ADB will sign a Project Agreement with SPG and SDIHG, under which SPG and SDIHG will undertake to do and ensure, and SPG will undertake to cause SDIHG to do and ensure, all things necessary so that the programme is implemented at all levels in accordance with the requirements of the ADB Loan Agreement and GCF Loan Agreement, the Project Agreement, the PAM and the various action plans and frameworks referenced therein. In the ADB and GCF Loan Agreements, ADB will require that the fund agreements for SGDF (primarily a limited partnership agreement and fund management agreement) be acceptable to ADB as a condition to initial withdrawal of loan proceeds. ADB will require in the Project Agreement, and will confirm, that such fund agreements and any subfund agreements or subfund coinvestment agreements, in addition to establishing a sound governance regime, require the fund to apply all relevant programme requirements to its operations and its investments. In the Project Agreement, ADB will also require the funds to enter into investment and project implementation agreements with all SGDF and subfund investees using template agreements acceptable to ADB. ADB will also require to receive acceptable templates as a condition to initial withdrawal of funds. ADB will also check the implementation of the investment/implementation agreements by pre-reviewing the proposed documents for the first several fund investments and for certain unusually large investments. The investment/implementation agreements will include covenants requiring the investee companies to comply with all applicable aspects of the Project Agreement, PAM, frameworks and action plans, and will include a requirement that ADB be given full access to and inspection and audit rights at the subproject companies. The Project Agreement will require SPG and SDIHG to ensure that SGDF and the subfunds enforce the investment and implementation agreements against the subproject companies.

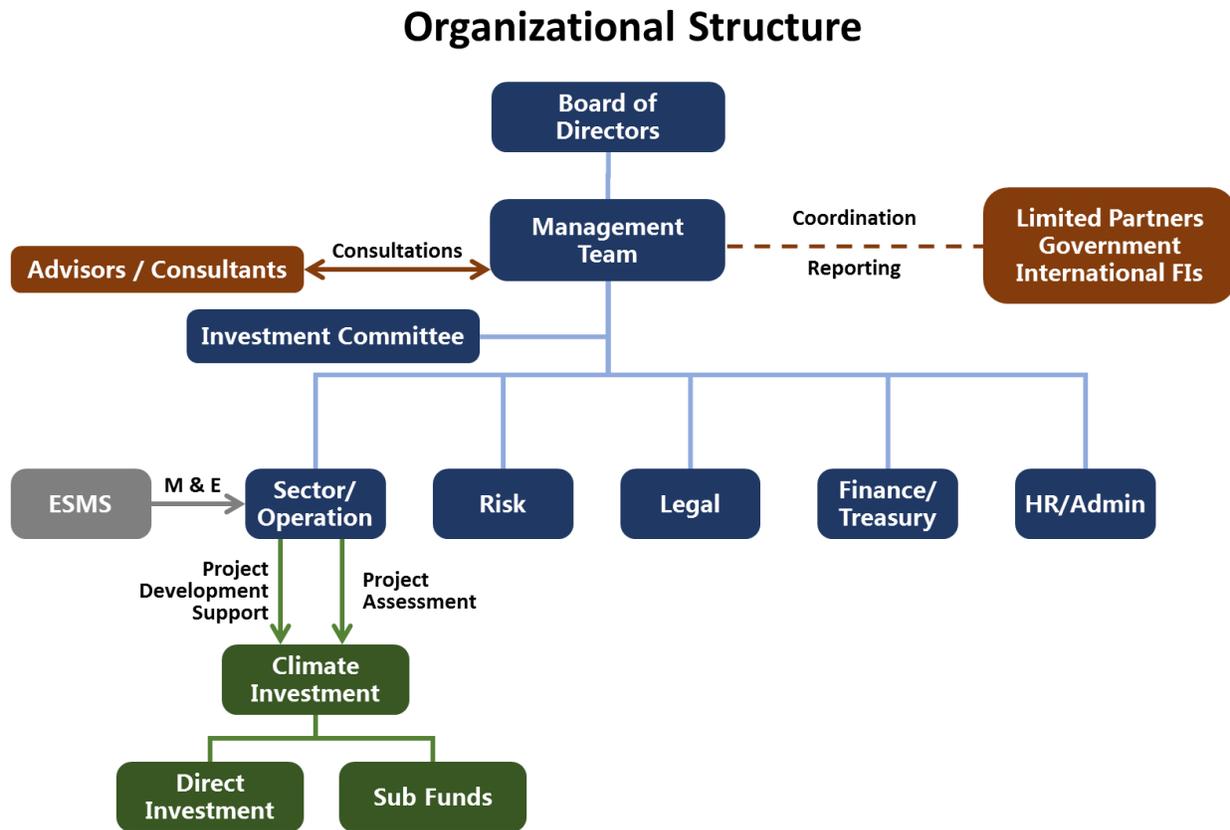
ADB will enforce compliance with the ADB and GCF Loan and Project Agreements during bi-annual Project Administration Mission or review missions during the first 5 years; annual review mission from year 6 to year 10 and as required from year 11 to 20. In addition to these reviews missions, a comprehensive midterm review mission of Programme implementation is required in Year 3 with two Special Administration Missions in Year 8 and 13 to assess subproject refinancing and revolving of funds into new projects. Those missions are sufficiently extensive to allow for any necessary midcourse corrections in agreements with SPG, PRC and the co-financiers. About one year after the Programme completion, a Programme completion review will document the achievements of SGDF.

ADB's Project Administration Instructions (as amended from time to time) detail the various types of project administration missions (PAI 6.02²⁶) conducted by the ADB project team and the level and content of reporting (PAI 6.03²⁷).

²⁶ <https://www.adb.org/sites/default/files/business-guide/33431/pai-6-02.pdf>

²⁷ <https://www.adb.org/sites/default/files/business-guide/33431/pai-6-03.pdf>

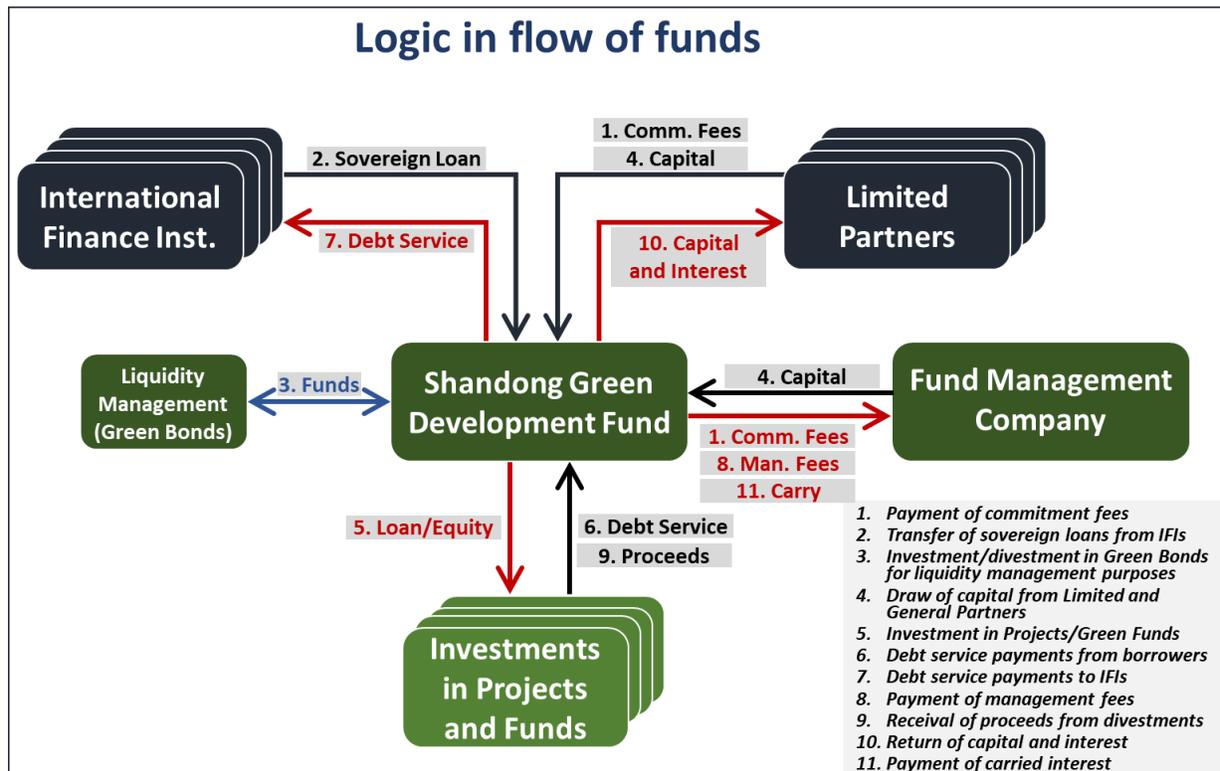
The organizational structure of the FMC is summarized hereafter:



Flow of Funds

The loan made by ADB PRC using GCF funds will be a sovereign obligation of the PRC, as such it is pari passu with the loan made with ADB's own funds and with the sovereign loans from other IFIs. PRC, acting through its Ministry of Finance (MOF) will make the GCF loan proceeds available to Shandong Provincial Government (SPG) on the same terms and conditions as apply to the sovereign loans, and SPG will onlend the proceeds to SDIHG. SDIHG will assume the foreign exchange risk, interest rate risk and investment risk of the loans and the downstream investments. SDIHG will invest the proceeds of the GCF loans in SGDF as equity under a limited partnership agreement. SGDF will invest the GCF proceeds in qualifying subproject companies either directly under investment and implementation agreements, as described above, or indirectly through further investments in subfunds, which will also be required to invest under acceptable investment and implementation agreements.

The flow of funds diagram below illustrates the following sequence: The General Partner establishes SGDF; SGDF withdraws IFI loans (by way of SDIHG, SPG and PRC), pro-rata according to the IFIs' loan commitments when the IFIs are all committed to fund the particular use of proceeds for which the withdrawal is made (it being recognized that GCF will not fund all SGDF activities) and funds from other LPs to invest in qualifying subprojects and sub-funds; debt service and equity investment returns are paid by investees to SGDF; SGDF distributes available funds to SDIHG and other investors pursuant to the fund waterfall, initially in amounts sufficient to enable SDIHG to pay its IFI debt service obligations (to SPG and PRC); SDIHG pays debt service on the IFI loans as per the terms and conditions of the IFI loan agreements; further capital and interest are returned to the LPs according to the fund waterfall until they have received their required returns; if further funds are available for distribution they are split between the General Partner/FMC and the other investors on a ratio 20:80; provided that the General Partner/FMC's "carried interest" may be reduced or eliminated if the Programme fails to achieve the dual objective of CO₂ emission reduction of 2 million tons per annum from 2025 and a balanced portfolio of 25% transformational and 50% advanced benefits (as per GCF Investment Framework).



Final SGDF structure and commercial details are subject to further market soundings and compliance with the laws and regulations of the PRC. Key principles will be as agreed with ADB, GCF and other IFIs and are anticipated to include the following:

- **SGDF structure:** Limited Liability Partnership. The investors in SGDF will comprise SDIHG, using funds provided by IFIs and any other moneys it decides or is required to invest, and government investors. PIC investors are likely to invest through a separate, parallel, fund (on the same terms as GCF except price and tenor) or directly as co-investors with SGDF into companies.
- **Fund manager and GP:** a joint venture between a fund management subsidiary of SDIHG and a top-tier asset manager to be selected on a competitive basis.
- **Target size of SGDF:** CNY10 billion (with a minimum size of CNY 1.36 billion), including commitments of CNY2.5 billion from local governments, CNY3.03 billion from SDIHG backed by IFI loans; and CNY0.1billion from GP all directly to SDGF. CNY4.37 billion is also expected in coinvestment from PIC investors.
- **Management Fee:** As required to cover GP/manager's core operating costs, but not to exceed 2% per annum of commitments²⁸; fee level and structure to be determined through competitive bidding and follow market practices. Management fee will cover the core expenses of operating SGDF and the fund manager.
- **Expenses to be borne by SGDF:** SGDF's establishment, investment, termination, dissolution, liquidation, including but not limited to start-up and set-up expenses.
- **Distributions:** Funds available for distribution at SGDF will comprise the interest/coupon on any investments (including any short term or cash investments), the profit component of any equity investment and the principal portion of any realized investments (including short term or cash investments); provided that SGDF will have an obligation to reinvest all funds available for distribution except such amounts as are required by SDIHG to repay any principal or interest on money borrowed from ADB and other IFIs, plus, where necessary a pro rata proportion to other investors.

²⁸ For financial modelling purpose, the fee is fixed at CNY45 million annually.

Funds available for distribution, after paying taxes, any debt and other obligations, of the fund and subject to any rights or obligations to reinvest or to reserve cash, will be distributed according to a waterfall: first to all investors until they have received a return of their capital contributions; thereafter the waterfalls will provide for distributions to different partners at different internal rates of return, to be negotiated. Thereafter, remaining funds available for distribution are expected to be split 80% to investors pro rata according to their capital contributions and 20% (or less) to the general partner/FMC, with the actual split depending on performance of the portfolio (25% transformation / 50% advanced benefits) and against green and climate targets (Beneficiaries and CO₂e reduction of 2 million tons per annum from 2025).

- **Target First Close of SGDF:** June 2019
- **Term of SGDF:** 20 years from first close plus up to 5 one-year extensions at the majority approval of LPs.
- **Investment period:** SGDF 15 years from the date of first close plus up to 5 one-year extensions at the majority approval of LPs.
- **Investment restrictions:** as per IFIs' Loan and Project agreements, including the GCF Investment Framework requirements, plus any further restrictions agreed with investors with ADB's written consent.
- **Investment committees:** As set out in LPA in line with market practice.
- **Related Party Transactions and other conflicts of interest:** Subject to majority approval of LPs' meeting, excluding any votes of interested LPs.
- **Transfer of interests by GP; replacement of manager:** not permitted without consent of supermajority (75%) of LPs and the prior written consent of ADB.

SGDF will issue the following investment instruments, as authorized under the laws and regulations of the PRC:

Investment Instruments	GCF	ADB	AFD/KfW	SPG/LG	PIC
Senior Debt	+	+	+	+	+
Mezzanine Debt	+	+	+	+	+
Direct Equity (up to 50%)	-	+	+	+	+
Green Bonds (under consideration after Year 5 for refinancing purpose)	-	-	-	+	+

The loan proceeds from GCF will only be used for Direct Investment in Senior or Mezzanine Debt.

For debt, the concessionality will be passed on by a lower interest rate than the market will offer to finance a subproject. For equity the concessionality will be passed on by a relatively lower requirement to the target rate for return of equity only in Transformational and Advanced Benefits subprojects. With the concessional financing, SGDF's assumed WACC is lower than for private funds.

Overall criteria for the SGDF portfolio have been defined by SDIHG in collaboration with ADB and the IFIs during the Programme preparation and are presented in Annex 9 as part of the investment strategy of SGDF derived from the climate vulnerability assessment of Shandong: (i) Reduction of CO₂e by 2 million Tons equivalent per annum from 2015; (ii) Portfolio balanced with 25% Transformational and 50% Advanced Benefits; (iii) direct investment 80% & sub-funds up to 20% [and limited investment of commitments in cash instruments for liquidity management]and (iv) all investments into which GCF loan proceeds are invested must be compliant with the GCF Investment Framework. The investment strategy cannot be changed without ADB prior written consent. (ADB will seek GCF consent before giving its consent where agreed in the FAA with GCF.) Eligibility criteria and requirements for individual subprojects on financial, economic and ESMS are summarized hereafter:

Selection Criteria and Requirements for All Subprojects: The subprojects supported by the Programme shall meet the technical, financial, economic, environmental, and social criteria below as well as the criteria in the Loan Agreement and the Project Agreement. The subprojects shall focus on the priority sectors described in Section C1.

Any subprojects, businesses or municipal/sectoral funds that contribute to climate change mitigation (measured through GHG/CO₂ emission reduction) or climate change adaptation (measured through improving the resilience of beneficiaries). SGDF can only invest in subprojects, businesses and municipal/sectoral funds that endorse the principles set for the Programme in terms of governance and investment strategy. In addition, the subproject will be screened with the criteria set under the GCF Investment Framework (No BAU subprojects can be financed by SGDF). The subproject will be

enhanced through the TA program to maximize the climate and green benefits. Subprojects will be proposed by the FMC and evaluated based on risk assessment and credit rating by the fund's investment committee.

All subprojects shall meet the following criteria:

- All subprojects shall contribute to climate change mitigation (measured through GHG/CO₂ emission reduction) or climate change adaptation (measured through improving the resilience of beneficiaries) and be compliant with the GCF Investment Framework.
- The proposed technologies to be used shall be the best available technologies where feasible (technical assistance program: design review advice).
- All subprojects shall be linked to Shandong.

Subproject Financial Criteria: All subprojects shall be financially viable. The financial analysis should be prepared in accordance with ADB's *Financial Management and Analysis of Projects guidelines*. In particular:

- The estimated subproject investment and operations costs, as well as cash inflows, shall be clearly presented and shall be reasonable.
- The financial internal rate of return (FIRR) calculated on a real basis consistent with the ADB Financial Management and Analysis of Projects guidelines shall be greater than the weighted average cost of capital.
- The FIRR shall be robust under various sensitivity scenarios.

Subproject Economic Criteria: For all the proposed subprojects, the total economic benefits shall exceed the total economic costs with an economic internal rate of return (EIRR) above 9%, when analyzed in accordance with ADB's *2017 Guidelines for the Economic Analysis of Projects*.

Subproject Environmental and Social Safeguards Criteria: All subprojects shall meet the following criteria:

- Each subproject shall meet requirements of the environmental and social management system developed for the Programme.
- The subprojects shall not have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. Environment Category A and B sensitive subprojects, within the meaning of the ADB SPS 2009, will be excluded from the Programme.
- Each subproject shall be designed, constructed, and operated in accordance with relevant national and provincial social and environmental laws and regulations.
- Each subproject shall design and implement a gender action plan based on the Gender Action Plan in Annex 6.4
- The subprojects shall not take place in areas with ethnic minorities.
- The subprojects shall generate employment and local economic development.

Selection Criteria for Qualified Sub-borrower:

- All Qualified Sub-borrowers shall be financially creditworthy and not have a poor credit record, as recorded in the People's Bank of China credit history database.
- The Qualified Sub-borrowers shall be capable to, and shall, contribute a minimum of 50% of the total subproject investment cost as counterpart financing through a combination of debt and equity.
- The Qualified Sub-borrowers shall commit to enhance their capacities in project planning, financing, implementing and monitoring during the subproject preparation and implementation periods.
- The Qualified Sub-borrowers shall have complied with all relevant domestic environmental regulations and shall acquire relevant environment permits with respect to the existing facilities where the subproject will be implemented.
- The Qualified Sub-borrowers shall be in compliance with relevant domestic occupational health and safety standards.
- The Qualified Sub-borrower's debt service coverage ratio, taking into account the proposed debt investment for the relevant subproject, calculated as per the related ADB guidelines, shall be greater than 1.2. Any inconsistency shall get ADB's prior acceptance.
- The Qualified Sub-borrowers will pass a confidential integrity due diligence check (footnote 7)

C.8. Timetable of Programme Implementation (refer to Annex 8. for tentative timetable for project implementation)

TASKS (Outputs by Component and sub-Component and Activities) / YEAR	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
1. Shandong Green Development Fund set-up																					
1.1. Establish & staff SGDF core financial management																					
1.2 Enter into agreement with experienced GP to strengthen core team	*																				
1.3. Undertake assessment of subprojects & implement required financing structures	*																				
1.4. Undertake financing subprojects		*																			
2. Project Development																					
2.1. Establish & staff Project Preparation Facility	^																				
2.2. Undertake design & financial structuring support of Subproject sponsors ¹		*									*										
3. Knowledge and Capacity Development: 3.1 Capacity Development; 3.2 M&E Support; 3.3 Green Rating Support																					
3.1.1 Progressively document process and assess capacity development needs	^	X																			
3.1.2. Design, organize and carryout training workshops			°																		
3.2.1. Establish & staff subproject assessment and monitoring groups	^		°																		
3.2.2 Undertake M&E systems design and rollout			°																		
4. Policy Development																					
4. Policy roundtables with private sector, government, financiers		^X	X																		
Other Milestones																					
AE Reporting to GCF (APR)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mid Term Review and End Term Evaluation: mid-term Y3, special admin in Y8 and Y13;				X					X			X									
Notes																					
1. Over two rounds of project development as refinancing occurs																					
2. Standard Milestones: ^ Field consultants * First activity occurs ° System established X Event occurs – trainings/ workshops/ missions																					

D.1. Value Added for GCF Involvement

In the initial discussions with potential Programme partners at the Fund level and subproject sponsors at the project level, the inability of the banking system and capital market to supply the required finance for perceived higher risk climate related projects was a common theme – even from organizations that routinely tap such funding sources. The GCF's funding is central to the mixed financing and a key success factor for climate financing to successfully provide the impetus to decarbonize Shandong Province's economy because:

- GCF participation allows an assessment and final selection of climate related subprojects based on the subproject's own climate mitigation and adaptation benefits (which will be maximized) and bankability (which will be improved), rather than the strength of the balance sheet of the subproject sponsor;
- Funding from GCF provides the necessary critical mass of catalytic debt (30 to 50% of the Programme) to achieve a meaningful leveraging effect (at least 5 times) over a significant number of climate related projects (total projects financed at least \$7.5 billion over the 20 years lifespan of SGDF through the revolving and reinvested funds);
- The level of catalytic finance of the GCF's funding enables SGDF to enter sectors which cannot undertake structural change or interest the private sector, owing to the higher cost of climate-positive investment, such as low impact development for sponge cities; urban sanitation; urban transport, circular economy and transformational and advanced benefits projects; and;
- The shift from business as usual to advanced benefits and transformational is supported by the stricter investment criteria of GCF, whose participation ensures that international climate standards are applied, including a green procurement system to green the supply chain during project implementation. No BAU subprojects can be financed by SGDF, including subprojects not financed by GCF (Equity; Sub-Funds).

The case for mixed financing (including GCF financing) under SGDF is based on an objective review of the regulatory environment, the required returns of market and the operational risks, not on the origin of financial resources. The financing made available under the Programme is **targeted** (climate related investment), **time bound** (5 to 10 years), and **transitional** (SGDF finances up to 10 years with PIC refinancing afterwards, if need be) to achieve the transformational and required leveraging effect. The Programme leverages public and catalytic funds with PIC financing and does not create permanent market distortion as the climate resilient subprojects would not be bankable without SGDF funding. Those subprojects are then re-financed with PIC funds once they have established steady commercial returns. Therefore, the Programme establishes bankability support conditions; incentive structures linked to climate resilience results; financial conditions and principles for on-lending based on government's policies; exit and refinancing terms.

SGDF seeks to upscale the use, and maximize the impact, of climate bonds and green bonds. Climate / green bonds have also been much discussed as a solution for climate finance and have seen an increase in annual activity from 2014 to 2016 when almost \$100 billion worth of green bonds globally were issued. However, while green bonds will raise funds from institutional and retail investors, if they have been mostly placed in the markets by governments, banks, or corporations on the strength of their sovereign or corporate balance sheets rather than the strength of underlying green projects, then their ability to channel funds to low carbon development is limited by the fact of a limited bankable pipeline of climate resilient subprojects. The PRC is the largest global green bond issuer, with a 40% share of the green bonds market (\$17 billion) in 2016 alone. SGDF will seek to raise capital for climate resilient subprojects through the issuance of a targeted climate bonds and green bonds in the capital markets through asset-based securitization of the climate resilient portfolio financed by SGDF and well-balanced targeting 25% transformational (with 'perceived' higher risk); 59% advanced benefits (medium risk); and, 25% business as usual (lower risk).

As discussed above, the majority of issued green bonds have resembled green "use of proceeds" or asset-linked bonds and not climate resilient bonds. But the Programme endeavor provides a vehicle for a much more targeted approach, towards climate finance and climate bonds. Given its strict eligibility criteria, the climate resilient subprojects will continue to meet tightened government guidelines. Thus, it is envisaged that both the Programme itself could be partially or wholly recapitalized by climate bonds and that projects developed and financed by SGDF can utilize climate bonds either in their initial funding structure or to replace more expensive debt used during the project development phase. The SGDF's sub-funds also provide further avenues for quality climate bond issuance. Examples would be single project bonds that

provide exposure to specific low-carbon projects, or bonds that directly fund asset portfolios in climate resilient sectors, such as offshore wind, solar energy, energy efficiency.

The catalyst role played by the IFIs in general and GCF in particular is critical to the success of SGDF and therefore to support the low carbon development policies of Shandong and the government's INDC.

SGDF is helping to overcome barriers such as affordability constraints, first-mover risks, behavioral and perceived risks, low technology penetration rates; catalytic funds are proposed to be used as a 'seed' money (direct investment in climate resilient subprojects and green businesses, key municipal and sectors' sub-funds, incentives, knowledge and policy support, project development technical assistance, etc.) to attract and mobilize PIC finance with staying power through de-risking structures and transformative interventions supported by SGDF as a mixed financing investment vehicle for the provincial government to achieve peaking CO₂ emission by 2027.

D.2. Exit Strategy

SGDF's capital of \$1.5 billion targets to support at least \$7.5 billion of climate related investments in Shandong Province, resulting in a leveraging ratio over 5 during the 20 years lifespan of the Programme. The level of catalytic funding (about \$500 million) provides critical mass of funds to crowd-in PIC finance and recycle the funding. The funding starts to be revolved and returned to SGDF from year 5, which is then applied to finance additional climate resilient subprojects further increasing the leveraging ratio of PIC funds.

All the funds from IFIs, including GCF are expected to be fully disbursed over 5 years following the financial close of SGDF. GCF lending is limited to direct investment for a duration of 5 to 10 years based on the level assessed against the GCF Investment Framework (as per Annex 9.). From Year 5, the funds will start to revolve back into SGDF and available for relending and for loan repayment (refer to Financial Model in Annex 3.) to AFD, GCF and KfW corresponding to the end of the 5 years grace period.

E.1. Impact Potential

Potential of the programme to contribute to the achievement of the Fund's objectives and result areas

E.1.1. Mitigation / adaptation impact potential

SGDF operates as a transformational and disruptive financial intermediary to generate and finance a pipeline of climate related projects as a model for upscaling in the PRC and in other developing member countries by ADB; with a minimum of 25% of projects, which achieve a “transformational” level of performance and 50% advanced benefits, based on GCF's investment criteria and framework.

Impact Potential:

The Programme ensures, through its portfolio focus and project assessment systems, that only projects with substantive mitigation and / or adaptation impacts are considered for financing. The portfolio-focus assessment warrants that major GHG sources and the most significant areas of climate vulnerability are addressed by SGDF, considering the prescribed targets for CC mitigation and adaptation. The project assessment system ranks the project against best current practice as a baseline and encourages performance beyond this level through the ranking system. The portfolio focuses, and project assessment criteria are applied for initial project screening, as a guide to development, and at project completion in relation to both mitigation and adaptation performance. The GCF core indicators are assessed by: supporting evidence supplied by pre-feasibility studies or feasibility studies vetted by the ADB (and co-financiers); Programme development team analysis during the Programme preparation on selected pilot subprojects; and analysis by the SGDF's technical assistance during the Programme implementation.

The core indicators for “impact potential” are summarized in Section E.1.2, namely:

- Mitigation core indicator - total tons of CO₂ to be avoided or reduced per annum; and,
- Adaptation core indicator - expected total number of direct and indirect beneficiaries and number of beneficiaries relative to total population (e.g. total lives to be saved from disruption due to climate-related disasters).

E.1.2. Key impact potential indicator

Provide specific numerical values for the indicators below.

GCF core indicators	Expected tons of carbon dioxide equivalent (t CO ₂ eq) to be reduced or avoided (Mitigation only)	Annual	2 million tCO ₂ eq (after Year 5)
		Lifetime	50 million tCO ₂ eq (25 years project life)
	<ul style="list-style-type: none"> • Expected total number of direct and indirect beneficiaries, disaggregated by gender (reduced vulnerability or increased resilience); • Number of beneficiaries relative to total population, disaggregated by gender (adaptation only) 	Total	10 million direct 25 million indirect (50% women)
		Percentage (%)	Direct 10% population (5% women)
Other relevant indicators	<p>Examples include:</p> <ul style="list-style-type: none"> • Expected increase in the number of households with access to low-emission energy • Expected increase in the number of small, medium and large low-emission power suppliers, and installed effective capacity • Expected increase in generation and use of climate information in decision-making • Expected strengthening of adaptive capacity and reduced exposure to climate risks • Others 		

The expected mitigation (75% of the investments) benefits ranges from a conservative 50 million to a total estimated 75 million tons CO₂eq over the 25 years' lifespan of the investments funded by SGDF. The calculation methodology for each subproject in the pipeline includes: (i) subproject design data, provided by the project sponsor; (ii) domestically / internationally accepted Standards (CDM.29, GS, VCS, ISO14064, GHG Protocol etc.); and (iii) official data, similar examples, research findings and literature reviews. Total emissions are calculated by comparing the subproject estimates against the relevant baseline data.

The total for expected tons of t CO₂eq to be reduced or avoided includes a total 10 subprojects under consideration for SGDF funding, of which 3 subprojects have prepared Pre-FSR and another 3 subprojects have basic CO₂ reduction data.

Adaptation (25% of the investments) benefits include 10 million beneficiaries, or 10% of Shandong Province's population.

The Programme is in line or better in terms of performance for both CC mitigation and adaptation results owing to the transformative effect of the catalyzing climate finance fund generating a large number of climate resilient subprojects as well as leveraging PIC funding.

E.2. Paradigm Shift Potential

Degree to which the proposed activity can catalyze impact beyond a one-off programme investment

E.2.1. Potential for scaling up and replication (Provide a numerical multiple and supporting rationale)

SGDF will be replicated in and beyond Shandong province, first in priority provinces and then at the national level. Within the Province, it should be noted that the SGDF is affiliated to SDIHG, the investment vehicle of the Shandong provincial government charged with the structural transformation and decarbonization of the provincial economy. As such, the provincial Development and Reform Commission (DRC) is both represented on the Board of SDIHG and has close relations with SGDF staff. The SGDF, can demonstrate effective approaches to the development of climate subprojects and these approaches can be fed directly into the policy-making process. Lessons-learned and processes put in place with SGDF will be applied to other provinces and beyond the PRC – for example, ADB started to replicate the concept through the Green Finance Catalyzing Facility (footnote 1) in Indonesia for 2020 (\$500 million under discussion before upscaling in ASEAN through ADB lending program).

The Theory of Change diagram included in Section C2 provides the logical underpinning of the Programme. The design of the SGDF itself is critical to supporting the Theory of Change. The Programme is structured to ensure that subprojects entering the pipeline are: a) addressing priority GHG emission and climate vulnerabilities for the Province; and b) explicitly assessed on GCF investment criteria. The Theory of Change sets out the four key strategies adopted by the Programme to address the issues of scale and upscaling of PIC finance for climate subprojects – these are operationalized through the four components of the Programme. These are: a) provision of patient, blended resources to support such subprojects; b) provision of resources to formulate and structure transformational subprojects that attract and leverage private sector and other institutional finance; c) the capacity to develop capacity and knowledge relating to catalyzing PIC finance as set out in Section C; and d) the capacity to influence policy development to facilitate upscaling of similar, future investments. In addition, through ADB and the government's knowledge resources³⁰, best practice experience will be documented and disseminated both in the PRC and internationally. In detail:

- i. The Programme includes a \$10 million Technical Assistance budget for project preparation / development, capacity and knowledge development and policy support. These funds provide support to subproject sponsors to upgrade their subproject design using advanced and appropriate technology and process that can better achieve the climate investment criteria. Specifically, the assistance will guide subproject sponsors to upgrade project performance on GCF investment criteria (refer to Annex 9). Subproject sponsors are currently unaware of the range of potential financing and advanced technologies available that can enhance their proposal. The

²⁹ <https://cdm.unfccc.int/methodologies/index.html>

³⁰ PRC financed through ADB the Regional Cooperation and Integration Trust Fund

project preparation facility will be used on a reimbursable basis such that the cost will be included in the ensuing subproject loan. In this manner, the project preparation component will be sustainable over the long term.

- ii. The Programme aims at a leverage over 5 times the size of SGDF. Catalytic finance from GCF, ADB, AFD and KfW and potentially others is used only to provide the catalyst for other PIC funding, altering the risk profile as perceived by the private sector and institutional financiers, both as participants in initial financing and in refinancing. As part of the design of the Programme, the ADB project team canvassed a wide spectrum of potential subproject sponsors and found that, in many cases, they could not obtain commercial finance of the tenor, and to a less extent, the level of interest, that would make their proposed investments financially viable. By providing “patient capital”, the Programme is thus able to overcome this market failure and achieve a return commercial return in the long run. Such for-profit facilities are known in OECD countries – the Anglo-French Meridiam Infrastructure Fund, for instance – and thus the model is proven and sustainable in the long term.
- iii. The Programme also has considerable policy influence. As discussed above, the SGDF is under the SPG. SGDF, through its project preparation facility and systems to monitor and verify the outputs, outcomes and impacts of subprojects can provide the SPG with evidence-based recommendations as to most effective and efficient technologies, subproject structures and implementing arrangements for climate positive subprojects. Given that the Programme pipeline is structured to respond to the climate priorities of the Province, this input will be the more relevant and useful.

The assumptions underlying the capacity of the Programme to deliver this paradigm shift relate mostly to the Fund level and focuses on the policy consistency of the SPG and its influence on the direction of the SGDF operations. The risk that priorities will change is small but mitigated by “baking in” structures for selection of priority sectoral areas for investment based on mitigation and adaptation priorities, by the inclusion of strict assessment guidelines that define the expectations of a climate / green subproject, and by the institutionalization of a comprehensive M&E system that will monitor Programme and subprojects performance in relation to assessment criteria and which is linked to disincentives for poor performance. Further, at the Fund level, the capacity of the SGDF is itself critical and the risk of under-staffing is also present. ADB will make the establishment of an effective management structure a condition of loan effectiveness. Detail relating to these risks is set out in Section G. The assumption of effective operation of the SGDF relating to subprojects is also important. Other operational risks at the project level are also set out in detail in Section G.

Indicators of the outputs, outcomes and impacts are detailed in Section H below.

E.2.2. Potential for knowledge and learning

SGDF is piloting the concept developed by ADB (footnote 1). Already, the Programme is being presented at several national and international conferences attracting the interest of several national and international stakeholders (Hong Kong Monetary Authority; City of London; Shenzhen Municipal Government). Dissemination of the lessons learned of the Programme design and implementation is secured through the knowledge action plan of ADB and the cofinanciers.

Knowledge and Learning is promoted both at the level of the SGDF and through ensuring that each subproject includes, as a minimum, a clear, funded set of activities to document and disseminate outcomes / results. The project development process encourages extension of such activities to generate national and international partnerships, knowledge exchange and dialogue on integrated approaches to enhancing CC investment.

E.2.3. Contribution to the creation of an enabling environment

SGDF's innovative, transformative and disruptive approach designs a climate financing mechanism to leverage catalytic funding by a factor of up to 5. SGDF allows the financing of climate resilient subprojects and green manufacturing businesses with a higher risk profile. Business as usual largely prevents the private sector and commercial banks from participating in the CC subprojects. SGDF and the private sector participants are already starting to share the experience with other provinces and the central government agencies through exchanges, bidding (nation-wide companies) and demonstrations.

SGDF is creating an enabling environment to support the SPG in developing industry hubs, such as Hydrogen Valley Industrial Park, promoting and development with industries for commercial applications of hydrogen technologies for vehicles, batteries, ...

SGDF's innovative, transformative and disruptive approach designs a climate financing mechanism to leverage catalytic funding by a factor of up to 5. SGDF allows the financing of climate resilient subprojects and green manufacturing businesses with a higher risk profile and compliant with GCF Investment Framework. BAU is no longer an option for the SPG to meet its CC targets and largely prevents the private sector and commercial banks from participating in the CC subprojects. SGDF and the private sector participants can share the experience with other provinces through exchanges, bidding (nation-wide companies) and demonstrations.

E.2.4. Contribution to regulatory framework and policies

Since the SPG is strongly promoting and supporting low carbon policies through enabling the business environment for climate related projects and businesses, additional policies are expected to strengthen the current framework. For example, SPG is considering the adoption of stricter rules to fast track coal substitution projects as well increasing green building construction using safe and climate resilient pre-cast concrete. SGDF also pilots the implementation of a green procurement system (Annex 13) that can be upscaled to other provinces.

The government is strongly pushing climate related reforms, which require bottom-up feedbacks from projects and programs, such as lessons learned from SGDF preparation. Since March 2018, the government is working on a draft renewable energy obligation policy, which gives hard targets for Shandong Province to reach 7% renewable energy production (excluding hydro) by 2020 to curb GHG emissions. In terms of absolute increase, Shandong is among the top three provinces likely to see the largest increases in purchase of wind and solar renewable energy, which are supported by SGDF investments.

The Technical Assistance program provides for the financing of experts recruited as individual consultants to assist the Provincial Government to define the low carbon policies post 2020 in line for the upcoming 14th Five Year Plan (2021 – 2025). The experts will draw on their international experience, but also on the lessons learned from setting up the SGDF and the initial pipeline financed.

E.3. Sustainable Development Potential

Wider benefits and priorities

E.3.1. Environmental, social and economic co-benefits, including gender-sensitive development impact

Sustainability / Due diligence:

The Programme preparation and the design of the SGDF with SPG and the co-financiers provide a robust design, in which risk management and risk mitigation is evaluated in Section G. The Programme complies with all the regulations of ADB and GCF with key measures included as covenants in the loan agreement, especially on governance. The Programme preparation focused on:

- (i) Technical and climate change. Develop eligibility systems per global climate change norms; undertake technical due diligence; define climate resilience impact indicators; establish climate resilience screening and appraisal systems; and provide design advice for new and advanced technologies.
- (ii) Economic and financial. Develop criteria and business processes, such as economic and financial IRR, hurdle rates; capital markets roadmap; institutional investor roadmaps; 'Climate Finance Value for Money' frameworks; and credit rating approaches for the financial intermediary, SGDF. The Programme: (a) provides analysis to underpin prioritization of Climate Finance needs; (b) develops economic eligibility criteria for climate finance; and (c) establishes clear guidance for SGDF on appropriate valuation techniques and data sources for nonmarket benefits generated by climate finance.
- (iii) Governance. Financial management, procurement, integrity due diligence, anticorruption, policy and legal, other institutional mechanisms and on lending mechanisms to be implemented through the capacity development of SGDF.
- (iv) Legal. Develop options for capital infusion from institutional investors; assess the legal aspect of capital markets access; and use escrow structures for risk mitigation.
- (v) Safeguards. SGDF follows the ESMS customized for the type of subprojects to be financed by SGDF. Subprojects categorized A or B, sensitive for environment defined under ADB Safeguard Policy Statement (2009), are excluded from financing from SGDF. The Programme monitors subproject's beneficiaries, including vulnerable people, through the socio-economic data disaggregated by gender and recorded in M&E report. In addition to the ESMS, SGDF includes a gender action plan as framework to guide the preparation of subprojects' gender action plan.
- (vi) Stakeholder coordination. Work with development partners, CCICED, UNEP and private, institutional and commercial funds on co-financing, policy development, institutional arrangements and harmonizing safeguard principles and requirements across co-financiers.

Subprojects' pre-feasibility and feasibility studies provide the expected environmental, social and health, and economic and environmental co-benefits. They also set out the gender development impacts. The subproject should, as a minimum, demonstrate that it has considered ways to maximize the local economic benefits of the proposed investment, where possible and incorporate gender sensitive design features to enhance women's inclusion and participation. It should be designed to provide opportunities for enhancing employment either directly (see Cities Development Initiative in Asia sectoral guidelines as an example) or indirectly through enhanced productivity, skills and / or competitiveness.

The Programme is designed to meet the Asian Development Bank's (ADB) Effective Gender Mainstreaming categorization, as highlighted from the gender specific indicators in the monitoring framework:

- Women with increased resilience due to the use of clean technologies and better knowledge to deal with climate changes reach at least 3.5 million by 2025 (2017 Baseline: 1.75 million).
- 100 persons from project sponsors, SGDF and local government including 40% women improved skills and understanding in climate finance by 2025. (2017 baseline: 0).
- 100 persons from project sponsors, SGDF and local government including 40% women improved skills and understanding in green procurement by 2025. (2017 baseline: 0).

Activities outlined focus on (i) ensuring women's equitable participation in the subprojects to be financed by SGDF, including public consultation, (ii) implementing gender-responsive features of the subproject, (iii) promoting employment and income generation opportunities for women, and (iv) building institutional capacity for gender mainstreaming. The implementation of the gender framework will be financed by the FMC through access from the TA program resources and monitored through collection of gender-disaggregated data.

Social co-benefits include improved access to education; cultural preservation; health and safety. At base, ADB social development and safeguards need to be addressed adequately, which ensures community involvement and education; limits negative health impacts and promotes safety. At a higher level the Programme leads to active adoption of climate positive action by stakeholders involved in the Programme, building their community resilience to climate change impacts and ensures that the investments benefits are shared by lower income / disadvantaged or vulnerable groups in terms of employment, community participation and quality of life. In relation to gender, relevant ADB gender policy needs to be addressed adequately, with more effective subprojects supporting proactive involvement of women in project planning and implementation and the most effective supporting gender mainstreaming. The Programme

includes technical assistance that will finance knowledge products, workshops, community outreach and specific education programs.

Environmental co-benefits include improved air quality, water and soil quality, and biodiversity.

- i. At a base level, ADB Safeguard Policy Statement 2009 and ADB's Prohibited List require full compliance.
- ii. At a higher level, the Programme can act as catalyst for broader adoption of policies and process which will provide significant co-benefits such a better air / water quality in a broader region or in other regions.
- iii. At the fund level, the output of 50 million tons of CO₂ reduction displaces around 19 million tons of coal resulting in the reduction of: 162,213 tons of NO_x, 141,221 tons of SO_x.
- iv. At the project level, co-benefits are assessed during subproject feasibility and rewarded via the green indicators. The three indicative subprojects have environmental co-benefits, demonstrated in the Project Pre-FSRs for example the 'Transformative Energy Management for Zero Energy at Expressway Service Centers Service Stations' reduces air pollution (SO_x 2,680 and NO_x 1,351 tons/year respectively), recycles solid and liquid waste and provides and education forum for showcasing zero waste technologies.

Finally, the Programme has positive social impacts by building climate resilience in Shandong Province in general and in the targeted project areas, in particular. It is expected that the Programme will directly benefit about 10 million people in Shandong, and indirectly about 25 million from Shandong, neighboring Provinces. The Programme will directly create new employment opportunities and improve local economic development in the Province.

ADB Safeguard Policy Statement 2009 and GCF and ADB's Prohibited List require full compliance at a base level. At a higher level, the Programme can act as catalyst for broader adoption of policies and process which will provide significant co-benefits such a better air / water quality in a broader region or in other regions. Pollution indicators and performance need to be addressed by sector.

E.4. Needs of the Recipient

Vulnerability and financing needs of the beneficiary country and population

E.4.1. Vulnerability of country and beneficiary groups (Adaptation only)

Under SGDF, the subproject sponsor must describe the scale and intensity of vulnerability of the beneficiary groups and elaborate how the subproject addresses the identified needs. The pre-feasibility and feasibility studies expand the discussion of vulnerability set out in relation to adaptation under the impact criterion – and the level of mitigation investments and related pollution benefits. The proposed activities will be encouraged to support specific beneficiary groups identified as particularly vulnerable in national climate or development strategies, which should then be highlighted with relevant sex and other disaggregation. The TA program includes quality control and design review advice steps to increase and maximize the subproject's benefits.

In relation to the Programme as a whole, each subproject assessed, using the process set out in Annex 9, will be benchmarked against the priority adaptation investment needs of the Province as determined by the Climate Assessment set out section C1 and detailed in Annex 14.2. In the climate assessment, the priorities were determined by estimates of numbers of people at risk. While the resultant portfolio targets are not "hard" targets, SGDF is expected to skew investment approvals towards these targets – which are also priorities for the Shandong government.

E.4.2. Financial, economic, social and institutional needs

The Programme addresses the absence of alternative sources of financing mechanisms for climate finance. Specifically, it addresses the inability of local capital market to supply sufficient CC project finance given the national government's increasingly stringent curbs on local government borrowing necessitated by the contribution of local governments and their related entities to PRC's large debt overhang.

With international standards, SGDF acts as a catalyst for local climate finance in capital markets and provides new instruments and new funding sources for climate finance.

E.5. Country Ownership

Beneficiary country (ies) ownership of, and capacity to implement, a funded programme

E.5.1. Existence of a national climate strategy and coherence with existing plans and policies, including NAMAs, NAPAs and NAPs

The Programme is aligned with the country's national climate strategy and priorities. Specifically, the Programme is in accord with PRC's Nationally Appropriate Mitigation Actions (NAMAs) objectives. The national government sees the facility as fostering a scalable, integrated approach to mainstreaming climate finance for local economic development, including infrastructure in general and urban infrastructure in particular.

The Programme directly supports the industrial transformation and the coal substitution's policies of the provincial government and the move towards mitigating the impact from the Water – Food – Energy nexus. It also supports the development of advanced technologies to reduce the reliance on coal and the use of fossil fuels by capitalizing on the Province's competitive advantage and promoting development in artificial intelligence, circular economy, micro-grids, solar roads and hydrogen cells leading to transformative and disruptive climate subprojects.

E.5.2. Capacity of accredited entities and executing entities to deliver

Accredited entity: ADB

In 2016, ADB celebrated 30-year cooperation with the PRC. During this period, ADB has been an active development partner and instrumental in PRC transitioning from a low-income to an upper middle-income country. ADB provided (i) comprehensive policy advice for the implementation of critical reforms, specifically, assisting with the preparation of the 11th, 12th, and 13th Five-Year Plans; (ii) 30 technical assistance projects to help the government develop 24 laws and regulations for a market-oriented economy and strengthen its implementation capacity; (iii) support for the government restructuring of state-owned enterprises and private sector development; and, and (iv) about \$20 billion financing for model infrastructure projects supporting by over 150 technical assistance programs.

Executing Entity: SPG

Under the 13th Five Year Plan (2016 – 2020), SPG targets four main areas: economic development, innovation drive, people's welfare, climate resilience and environment. Some key aspects of the Plan include: (i) Boost urbanization rate to 65% (55% in 2014) and fully eradicate poverty (3 million in 2016); (ii) Increase tertiary service sector to over 55% contribution to GDP (from 45% in 2015); (iii) Support strategic emerging industries; (iv) Enhance infrastructure systems (comprehensive transportation, modern energy, water conservancy, information network and urban and rural infrastructure support); and (v) Pursue green and low-carbon development, Shandong's economic and social development to 2020 focuses on ecological and sustainable development; and both the transformation and upgrading of current industries. Foreign cooperation and foreign direct investment are specifically stressed in official documents by the provincial government. Shandong Province has a long history of official development assistance in general and with ADB in particular.

Under SPG, SDIHG will participate as a co-GP in the FMC and as a LP in SGDF. SDIHG has a track record in successfully implementing public and private subprojects (including multiple funds) in Shandong (refer to Section C.4). SDIHG has experience with projects of the scale and scope of those envisaged as requiring green climate finance. The agency is also robustly viable. SGDF establishes, for each subproject, clearly defined implementation mechanisms and counterpart budgets for capacity development relating to the subproject under the TA program – and for upscaling them where appropriate. As part of Programme development, relevant stakeholder engagement processes are undertaken, consistent with ADB SPS (2009). The consultative process engaged with the national designated agencies (NDAs) and with the wider group of stakeholders.

Financial status. As of 2017, SDIHG incorporated 17 subsidiaries with ownership of ranging between 40% and 100%. The subsidiaries are mainly involved in investment, trusteeship, and advisory business, with a few in creative industry, electronic technology and training. The company delivered a solid financial performance in 2017 with total assets of CNY20.7 billion, total liabilities of CNY5.3 billion, total equity of CNY15.4 billion and net profit of CNY289 million.

Leverage is low with debt to equity ratio of 0.35. SDIHG recorded. Operating cash flows were stable at CNY351 million. Based on performance the company is expected to be in a sound financial footing.

Financial Projection of SDIHG							
Yuan 000'							
Year	2016	2017	2018	2019	2020	2021	2022
	Base year	Base year	Projection	Projection	Projection	Projection	Projection
general growth assumption			7%	7%	7%	7%	7%
Income Statement							
Operating revenue	138,321	224,326	216,421	231,571	247,781	265,125	283,684
Non-operating revenue	0	2,014	2,155	2,306	2,468	2,640	2,825
Total Revenue	138,321	226,341	218,577	233,877	250,248	267,766	286,509
Operating expenses	-113,638	-175,294	-183,569	-192,424	-201,899	-212,036	-222,884
Non-operating expenses	-1,442	-2,549	-2,727	-2,918	-3,122	-3,341	-3,575
Total Expenses	-115,081	-177,843	-186,296	-195,342	-205,021	-215,377	-226,459
EBITDA	23,240	48,498	32,280	38,535	45,227	52,388	60,051
Depreciation and investment gains	11,967	213,096	233,627	245,986	259,210	273,359	288,499
EBIT	35,207	261,594	265,907	284,521	304,437	325,748	348,550
Financial Expenses	12,055	9,508	10,173	10,885	11,647	12,462	13,335
EBT	47,262	271,101	276,080	295,406	316,084	338,210	361,885
Income tax	-8,773	19,697	-5,106	-5,464	-79,021	-84,552	-90,471
EAT	38,490	290,799	270,974	289,942	237,063	253,657	271,414
Balance Sheet Statement							
Current Assets	2,803,640	2,903,072	2,904,067	2,905,416	2,833,970	2,757,808	2,676,600
Non-Current Assets	4,106,767	17,751,854	20,917,957	21,829,846	22,761,653	23,714,770	24,690,689
Total Assets	6,910,407	20,654,926	23,822,023	24,735,263	25,595,623	26,472,578	27,367,289
Current liabilities	1,147,735	2,544,805	502,528	502,528	502,528	502,528	502,528
Long term liabilities	2,120,854	2,711,443	2,711,443	3,338,812	3,966,182	4,593,551	5,220,920
Liabilities	3,268,589	5,256,248	3,213,971	3,841,341	4,468,710	5,096,079	5,723,448
Equity	3,641,818	15,398,678	20,608,052	20,893,922	21,126,913	21,376,499	21,643,841
Total Liabilities and Equity	6,910,407	20,654,926	23,822,023	24,735,263	25,595,623	26,472,578	27,367,289
Liabilities	47%	25%	13%	16%	17%	19%	21%

Investment operations. SDIHG staff are experienced with investment processes and are supported by external resources when relevant e.g. legal due diligence (DD) for larger investments. SDIHG's own procedures on investment DD is a standardized investment approach and ensures that important investment aspects are covered. Quality procedures including review by an investment committee are fully implemented. Each subproject will be assessed against criteria set out in Annex 9. These criteria provide a standard against which subprojects are measured as they move through the process of engagement with the SGDF. At initial assessment, they provide the basis for a decision on whether or not to allow the subproject access to the technical assistance program. On the finalization of the project design, they constitute the basis for determining the terms of investment and for setting covenants addressing critical issues for project performance. During implementation, they constitute the basis for monitoring and evaluation. The M&E system (see Annex 11) captures all relevant data and provides reporting to funders and other stakeholders.

E.5.3. Engagement with NDAs, civil society organizations and other relevant stakeholders

Engagement among the NDA:

The Programme is included into ADB's Country Operations Business Plan 2017-2019 and confirmed into the Country Operations Business Plan 2018 – 2020 for 2018 with co-financing. Modalities and processing schedule for co-financing is being discussed with the EA and IA and with the NDA at the Ministry of Finance. This would be the first GCF financed Project in the PRC and the Concept Note endorsed by the Secretariat was shared with the NDAs.

Relevant Stakeholders:

Relevant PRC financial institutions can be divided into four groups: (i) the policy banks (e.g. China Development Bank), (ii) the major commercial banks (Agriculture Bank of China, China CITIC Bank, Shanghai Pudong Development Bank), (iii) insurance companies and (iv) social security and pension funds. Other “less regulated” financial institutions, ranging from investment banks to various types of financial “Trusts”, are subject to different regulations. Guidance has been issued in relation to different instruments, for instance Green Bonds / PPPs / Insurance. Any of these institutions could potentially become partners with SGDF after proper integrity due diligence is conducted and documented adherence to the international climate standards.

The ADB project team conducted interviews with major players in the commercial green banking sector; insurance industry and social pension funds. The ADB project team also benefitted from the lessons learned from setting-up previous environmental and energy funds in PRC, especially the Beijing – Tianjin – Hebei Air Pollution Reduction Program. Representatives from SDIHG is conducting market surveys to assess market demands, appetite from the PIC investors and modalities for investment. SDIHG is planning road-shows for fund raising activities in 2018 and 2019.

E.6. Efficiency and Effectiveness

Economic and, if appropriate, financial soundness of the programme

E.6.1. Cost-effectiveness and efficiency

Subproject economic and financial analysis makes the case for strong cost effectiveness and financial soundness. For SGDF, the efficiency and effectiveness core indicators are preliminarily estimated at:

- \$30 per tCO₂eq (total investment cost/expected lifetime emission reductions); and
- Expected total volume of \$5 billion finance (including refinancing) to be leveraged from SGDF's financing – a leverage ratio of 5 on the SGDF capital throughout the life of the fund.

In general, the economic and financial analysis, including the financial model if applicable, should guide the preparation of the response to this criterion. The subproject's pre-feasibility studies specify the following factors:

- Financial adequacy and appropriateness of concessionality: Along with the financial model and analysis, SGDF may also specify how the proposed financial structure (funding amount, financial instrument, tenor and term) is adequate and reasonable, and further demonstrates that how structure provides the appropriate concessionality to make the proposal viable;
- Amount of co-financing: For mitigation projects, the co-financing ratio (total amount of the SGDF's investment as percentage of project) should generally be provided and detailed for subprojects that may not leverage a significant level of up-front co-financing; and the level of indirect or long-term investment mobilized from the proposed activities;
- Financial viability and other financial indicators: Indicators of particular interest include the economic and financial IRR (with and without SGDF's support). Other financial indicators, including the debt service coverage ratio, may be provided as applicable. A description of the financial soundness in the long term beyond the SGDF's intervention may also be helpful.
- Key efficiency and effectiveness indicators:
 - Estimated cost per tCO₂eq to total investment cost divided by the expected lifetime of emission reductions – performance by sector has been established (mitigation only) benchmarked against McKinsey China Cost-Abatement calculations³¹ which have been validated, and adjusted for improvements in technology and current costs, during the project preparation (see Annex 9) and the incentive structure of the facility will encourage project sponsors to better “average” performance in relation to the relevant sector benchmarks; and
 - Expected volume of finance to be leveraged by the proposed project and because of the SGDF's financing disaggregated by public and private sources.

Subprojects Financial and Economic Selection Criteria:

All subprojects shall be financially viable. The financial analysis should be prepared in accordance with ADB's Financial Management and Analysis of Projects guidelines. In particular:

- The estimated subproject investment and operations costs, as well as cash inflows, shall be clearly presented and shall be reasonable.
- The financial internal rate of return (FIRR) calculated on a real basis consistent with the ADB Financial Management and Analysis of Projects guidelines shall be greater than the weighted average cost of capital.
- The FIRR shall be robust under various sensitivity scenarios.

For all the proposed subprojects, the total economic benefits shall exceed the total economic costs when analyzed in accordance with ADB's 2017 Guidelines for the Economic Analysis of Projects.

E.6.2. Co-financing, leveraging and mobilized long-term investments (mitigation only)

³¹ See McKinsey and Company. 2009. China's Green Revolution: Prioritizing technologies to achieve energy and environmental sustainability. Beijing.

Refer to financial model in Annex 3:

- \$500 million from IFIs within a \$1.5 billion SGDF: Leverage Ratio = 3
- Refinancing of revolving funds from Year 5 to finance at least \$7.5 billion climate resilient projects over the duration of SGDF (20 years): Leverage ratio = 5

Co-financing is documented in Section B2 and recorded by the donor's agencies letters included in Annex 4.

E.6.3. Financial viability

Financial analysis of fund setup

Financial analysis was conducted to investigate the financial viability of the fund under realistic and balanced modeling assumption:

- The loans from the IFIs are on-lent to SPG and then to SDIHG on same terms and conditions with a counter guarantee from the provincial to the central government. The currency exchange risk as such stays at SDIHG level and passed through SGDF.
- SGDF organizes its investments and liquidity management funds to service SDIHG's obligation of IFI loans, with SDIHG's other resources for any shortfall.
- The SPG and local governments' capital commitment to SGDF are provided on favorable terms allowing the SGDF to reserve proceeds from investments that are attractive to private capital.
- SGDF's asset allocation is made in direct investments (80%), sub-funds (20%) and liquidity management purposes as needed – with maturity tailored to allow for two rounds of investments within the lifetime of 20 years of SGDF.
- Investment period is averaged five years matching the disbursements of IFIs' loans. Matching capital from Investors' commitments will be called when required for investments. Exit of investments and return of proceeds to investors will be in the three last years of the two investments rounds.
- The direct investment is provided to subproject sponsors on the same terms and conditions from the IFIs plus margin for foreign exchange, maturity premium, credit risks, as well as their level of climate performance (good, advanced, transformational).

Financial analysis of subproject investments is carried out by SGDF. The Fund investigates the funding requirements as well as the financial of the subproject sponsor. A maximum of 50% of the capital expenditures of each subproject is assumed to be funded by SGDF for transformational subprojects on a sliding scale for advanced and good subprojects. The financial analysis assesses the financial viability of the individual investment and optimize the mix of catalytic funding requirement. Financial justification for each subproject is supported by a Financial and Cost Benefit Analysis. The subprojects' cost estimates and benefits are identified using a with / without project methodology. Based on the results, the Financial Internal Rate of Return (FIRR) is calculated under alternative subproject assumptions to provide basis for conclusions on the financial robustness of the subproject together with sensitivity analysis.

E.6.4. Application of best practices

The key innovation of the Programme is the concept of catalyzing climate developed by ADB (footnote 1) to leverage catalytic funding with public and private finance by a factor over 5 supporting the documented low carbon action plan of Shandong Province. The Programme moved from traditional Green to international Climate Finance supporting a pipeline of climate resilient Projects. The pipeline, in the Assessment process set out in Annex 9, is benchmarked against the priority mitigation and adaptation investment needs of the Province as determined by the Climate Assessment set out section C1 and detailed in Annex 14.2 which determined target portfolio weightings.

SGDF is looking at transformational technologies going beyond research and development promoting new technologies including :

- (i) Hydrogen cells for transport and mobility with the setting up in Shandong Province of the Hydrogen Valley, an industrial park promoting research and development on fuel cell technologies through venture capital and incubator businesses;

- (ii) Solar Roads Program is not only for energy production but for the provision of a framework for autonomous driving and potential recharge of EV while driving, as well as internet support and renewable energy distribution;
- (iii) Low carbon - circular economy of service stations along the expressways based on micro-grid for energy production and distribution from renewable energy available locally and systematic enhancement of energy savings measures, allowing the setting-up of service stations in isolated and remote areas without access to electricity and various biomass projects in rural and peri-urban areas promoting micro-grid energy supply;
- (iv) Inclusive Photovoltaic Power Generation for telecom towers for mobile phones, Wi-Fi and internet of things equipped with solar panels to extend the service to remote areas;
- (v) Greenhouses equipped with solar panels to enhance food production resulting in improved food security;
- (vi) Off-shore wind renewable energy production;
- (vii) Green building manufacturing fast tracking construction in a safe manner with higher fire resistance and improving climate resilience and energy efficiency of the building; and
- (viii) Biomass renewable energy production in peri-urban areas using high rate anaerobic digestion.

In addition, SGDF promotes the use of:

(i) SOURCE ³²: An innovative information technology platform developed by ADB and endorsed by several governments, international financing institutions and the private sector. SOURCE is a digital platform designed to speed up the delivery of infrastructure in the public sector across the developing world. It is designed to help public sector agencies prepare, manage and publish their infrastructure projects and to attract private sector investment. This cloud-based system allows to present information on all aspects of development of an infrastructure project in a transparent, consistent and efficient manner, using sector-specific sets of questions (also referred to as “templates”). Templates are currently available for 36 sub-sectors, which were developed in liaison with experts from the public and private sectors.³³ The templates are available in several languages including Mandarin Chinese. The platform also provides immediate connectivity tailored to the needs of the public contracting authorities on a national and subnational basis. The Sustainable Infrastructure Foundation, a not-for-profit Swiss Foundation headquartered in Geneva, operates and coordinates the provision of SOURCE in conjunction with multilateral development banks. SIF’s mission is to globally disseminate the use of Source among governments, public institutions and agencies for project preparation of sustainable and climate resilient infrastructures, a widespread collaborative platform for managing infrastructure projects, as well as a one-stop-shop for prospective private investors.

(ii) Green procurement (Annex 13) based on European standards and customized to meet PRC needs. The Green procurement system in place allows the greening of the supply chain for manufacturing businesses and infrastructure projects. Business as usual projects that decide to include green procurement into their project design will move to the advanced benefits category and receive additional incentives in terms of concessionality and loan maturity.

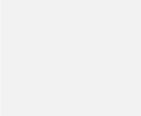
E.6.5. Key efficiency and effectiveness indicators

	Estimated cost per t CO ₂ eq, defined as total investment cost / expected lifetime emission reductions (mitigation only)	
<i>GCF core indicators</i>	(a) Total project financing	US\$1,500,000,000
	(b) Requested GCF amount	US\$180,000,000
	(c) Expected lifetime emission reductions overtime	50,000,000 tCO ₂ eq
	(d) Estimated cost per tCO₂eq (d = a / c)	US\$30 / tCO₂eq

³² <http://sif-source.org>

³³ Water and Waste: Desalination, Irrigation, Solid Waste Facility, Waste Water Treatment, Water Supply Infrastructure; Energy: Biomass, Dam, Geothermal High Temp, Geothermal Low Temp, Geothermal Medium Temp, Hydro Run-of-River, Solar Array, Wind Farm, Wind Farm Offshore; Transport: Airport, Bridge, Bus Rapid Transit, Car Park, Dry Port, Highway, Intercity Rail, Light Rail Transit, Mass Rapid Transit, Metro, River Ferry, Road, Seaport, Tunnel; Social Infrastructure: Hospital, Housing, Prison, School; Urban Services: District Heating, Energy Efficiency in Buildings, Street Lighting.

	<p>(e) Estimated GCF cost per tCO₂eq removed (e = b / c) US\$3.60 / tCO₂eq</p> <p>The estimated cost per tCO₂eq is less than \$50 in line with climate change practices.</p>
	<p>Expected volume of finance to be leveraged by the proposed programme and as a result of the Fund's financing, disaggregated by public and private sources (mitigation only)</p>
	<p>Refer to Financial Model in Annex 3.</p>
<p>Other relevant indicators (e.g. estimated cost per co-benefit generated as a result of the programme)</p>	<p>Air pollution mitigation is a major environmental co-benefit from the Programme.</p>



F.1. Economic and Financial Analysis

Financial analysis of investments by SGDF

Financial Analysis was prepared to investigate: (i) SDIHG's affordability of the loan facilities provided; (ii) financial sustainability of SGDF based on the type of investments planned; (iii) financial return of individual example project investments presented. Economy Analysis was solely prepared for example project investments – and as such not at fund level. It can however be assumed that the economic return on investment level largely represents the economic return of the entire fund.

I. SDIHG affordability of the borrowing from the IFIs. SDIHG - is the end-borrower of the funding from the Internal Financial Institutions of CNY 3,137 million in total. The funds are on-lent to SDIHG from Shandong Provincial Government. SDIHG will provide the funds the IFIs as committed capital to Shandong Green Development Fund – SGDF. SDIHG was founded in December 2015 based on assets transferred from Shandong Provincial Construction Fund, which is controlled by Shandong Provincial DRC. Assets valued at around CNY 24,000 million has been transferred to SDIHG during the years of 2015 to 2018, mostly on a debt-free basis. SDIHG's 2017 Financial Statements show liabilities to total balance at app. 25% with a further reduction to 13% expected in 2018. SDIHG holds CNY 2,900 million in cash and liquid placements. SDIHG's funding of SGDF is guided by the IFIs' loan terms (disbursements and debt service) for the purpose making the funding cash flow neutral to SDIHG. The financial position of SDIHG is as such not expected to change significantly from the funding and the commitment to SGDF. The balance sheet of SDIHG will though be impacted by increasing long-term liabilities from IFI's funding of CNY 3,137 million. With the funding SDIHG's liability to balance ratio will increase from 13% in 2018 to 22% in 2023, when the loans are fully disbursed. The funding from the IFIs is as such found fully affordable to SDIHG. Requested by Shandong Provincial Finance Bureau SDIHG's ownership in Shandong Railroad Company valued at around CNY 3 billion. has been allocated as collateral for the IFI loans.

II. SGDF's financial performance. Financial analysis was prepared to demonstrate that the fund will provide satisfactory returns while investing in climate projects. The analysis was prepared under assumptions of; type of financing debt/equity; climate performance good/advanced/transformational; tenure; financing terms and expected returns; projects and sub-funds. For debt financing the assumptions were tailored to provide attractive funding to climate projects reflecting the concessional terms of the funding from IFI. The financial analysis shows that SGDF will be able to provide an overall return to the investors over 6%. Modelling the structure of public and private investors' return requirements moreover demonstrate that the fund will be able to provide attractive returns to private investors reflecting such investors relatively higher cost of capital. Under the assumptions made, the financial analysis (Refer to Financial Model in Annex 3) shows that SGDF is able to meet the on-lending terms from SDIHG and provide the SGDF's private investors with a basic risk-adjusted return on their capital invested. The average FIRR of SGDF is about 6.7%, of which public sector investors' FIRR is estimated at 3.6% and private sector investors' FIRR at 9.1%.

III. Financial and economic analysis of selected example project investments. It is a general requirement that the SGDF make investments in projects, which are financially viable from a borrower perspective. SGDF will ensure that its debt and equity funding provided is profitable to SGDF also. Financial analysis of selected example projects was prepared and demonstrated that satisfactory financial return of climate project investments can be achieved. Specifically, the analyses show that FIRR for the specific projects can be achieved at a level above 10% - estimated in nominal terms. Economic cost benefit analyses prepared for the same example projects included co-benefits of mainly reduction greenhouse-gas emission valued based on recommendation by IPCC. Other co-benefits included reduction of gasses of SO₂, NO_x, soot, methane as well as COD/BOD. The economic analyses showed that the economic co-benefits added significantly value to the overall business case. Specifically, the analyses showed that the economic co-benefits added a minimum of 35% to the main financial related benefits. The economic internal rate of return analysis for the few specific projects analyzed showed returns at a level above 14% - estimated in real terms. Financial and economic analysis is completed for the three representative climate resilient projects included in Annex 2 at Pre-Feasibility stage.

Annex 2.1. Large Scale Biomass Project:

Project financial analysis was prepared to determine whether the investment in the biomass project is financially sound. Main financial benefit derives from sales of electricity and liquid/solid organic fertilizer. Cost derives from purchase of

straw and operation and maintenance of the biomass plants. Projected in nominal terms the financial analysis shows a best case FIRR from the investments made of 19% over 10 years. There are however several risks associated with the project including technical construction and operation risks, risk associated with the pricing of fertilizer, and more, and sensitivity analysis show, that taking such risks into account the project FIRR is closer to 10%.

Economic analysis was prepared to show the economic impact from the investments made. Apart from the economic value of the financial benefits and costs (taxes and increased household income to farmers) main co-benefits derive from reduction of pollution of CO₂, SO₂, NO_x, soot, COD/BOD and methane. Economic prices on CO₂ follows IPCC recommendation while others follow China trading prices – (Refer to Annex 2.3). Methane reduction from collection of greenhouse plant waste was valued against cost of disposal at sanitary landfill site. Projected in real terms the economic analysis shows that the EIRR from the investments made could be of above 30% over 10 years.

Annex 2.2. Expressway Service Centers

Financial and economic cost benefit analysis were solely prepared for the PV part of the Service Area Project. Justification of the wastewater and solid waste subcomponents were based on Cost Effectiveness Analysis, as these services are regulatory requirement rather than revenue generating activities. Other subcomponents were not investigated: The E-charging is implemented from a strategic business perspective rather than a financial perspective; Other subcomponents such as the Wind Power were not found fully operational investigated.

Project financial cost benefit analysis was prepared to determine whether the PV subcomponent is financially sound. The main financial benefit derives from electricity savings. Cost of operation and maintenance is mainly related to cleaning of the PV Panels. Projected in nominal terms the financial analysis shows an expected FIRR from the investments made of 11% over 25 years, which is found satisfactory.

Economic cost benefit analysis was prepared to show the economic impact from the investments made. Apart from the economic value of the financial benefits main co-benefits derive from reduction of Green House Gases and other pollutants – SO₂, NO_x and soot. Calculation of co-benefits was based on IPCC's recommendation on economic pricing of CO₂ and trading prices of other pollutants – (Refer to Annex 2.3). Projected in real terms the economic analysis shows an expected EIRR from the investments made of 15% over 25 years, which is found satisfactory.

Annex 2.3. Solar Smart Grid for Telecommunication Towers

Project financial analysis was prepared to determine whether the project investments are financially sound. Main financial benefit derives from contracted delivery of electricity to China Tower Corporation. For providing a conservative estimate China Governments' subsidy was excluded due to uncertainty of its continuation. Costs of operation and maintenance are offset by a contracted maintenance fee paid by the Tower Company. Projected in nominal terms the financial analysis shows an expected FIRR from the investments made of 13% over 20 years, which is found satisfactory.

Economic analysis was prepared to show the economic impact from the investments made. Apart from the economic value of the financial benefits main co-benefits derive from reduction of greenhouse gases and other pollutants. Following the recommendation of IPCC, the pricing of CO₂ was valued at USD 36.30 per ton in 2016 prices with increase of 2% annually in real terms to allow for the potential of increasing marginal damage of global warming over time. This value is generally in line with China NDRC suggestion of a value not below CNY 200 per ton. As most of the CO₂ savings derives from reduction of electricity from coal fired thermal power, additional co-benefits are expected from reduction in SO₂, NO_x and soot. Adding the economic value of such reduction the total economic co-benefits increase by additional 50% - overall. Projected in real terms the economic analysis shows an expected EIRR from the investments made of 19% over 25 years, which is found satisfactory.

F.2. Technical Evaluation

ADB Project Team with SGDF staff appraised three climate resilient projects totaling investment of \$620 million reducing CO₂ emission by 88 million tons (\$7 / tCO₂) with total debt of \$472 million to be partly funded by SGDF, subject to credit committee approval. Over 10 projects at concept stage for SGDF funding consideration are listed in Annex 12. The three projects reviewed include:

(i) **Inclusive low carbon - circular economy Project (Transformational):** Micro-grid technology powered by renewable energy and green energy in 35 twinned service areas for expressways in Shandong; maximizing information

and communication technology, including artificial intelligence and robotics with an integrated energy management system for energy efficient buildings and services. Over 25 years, the transformed 35 twinned service areas would benefit 5 million users and reduce CO₂ emission by 5 million tons (\$37 / tCO₂). The project can be upscaled to build energy autonomous service areas in remote part of the country / region without access to electricity.

Background:

Expressway service areas typically consume large amounts of energy for catering, lodging, car and truck repair facilities, steam cleaning, restaurants, retail shopping areas and car and truck refuelling. The service areas generate CO₂ emissions from cars and diesel trucks, human and businesses activities (including wastewater from public toilets and domestic solid waste). These service areas are usually very basic and not landscaped with grass, shrubs and trees; they have wide expanses of surfaced area for truck and car parking. These surfaced areas generate large amounts of rainfall runoff during rainstorms with a poorly managed and inefficient drainage. Conventional diesel generation is used as standby power, equipment maintenance and cost are high. Energy use is not optimized with a lack of effective energy efficiency monitoring, analysis and management. The potential for renewable energy, including wind, solar and bio-energy / biomass and energy efficiency is currently not exploited.

Proposed project:

The project addresses these serious deficiencies by upgrading 35 pairs (70) of Shandong expressway service areas with clean energy production for lighting and fueling. Photovoltaic (PV) solar panels are the primary energy source of electricity and a proportion of power is also generated from wind and biomass. Electric vehicle charging stations are provided with energy-saving tower mounted lighting system installed and powered by tower mounted PV panels. Total project investment is CNY1.19 billion (\$185 million) with total debt of CNY0.96 billion (\$149 million).

(ii) **Coal substitution - photovoltaic power generation Project (Advanced):** Substitution of conventional energy supply from coal by photovoltaic (PV) power generation (150 MW) for mobile telecom towers in the whole Province, including remote areas with limited electricity access for mobile phone services. Over 25 years, the project would benefit mobile phone users in the province, reduce CO₂ emission by 4 million tons (\$45 / tCO₂) and coal by 1.3 million tonnes. The project can be upscaled to build energy autonomous telecom towers for mobile phone service in remote part of the country / region without access to electricity.

Background:

The 23,148 mobile telecom towers owned by Tieta Telecommunication Tower Group are connected to the provincial power grid dependent on energy production from coal. The potential for PV electricity generation to power the telecommunication towers is currently not exploited. The objective of making full use of renewable energy and saving on non-renewable fossil fuels reduces CO₂ emission.

Proposed project:

The Linuo Power Group Company proposes to install solar PV power generation panels on top of each of the 23,148 Tieta Group owned tower base station structures in Shandong Province. Each PV power supply unit integrates with the national power grid and supplies 20 to 25 kWh daily per tower out of a total of 150 kWh, including 3 to 6 kW for mobile phone 3/4G services. The capacity of each PV power station is 6.48 kW.

The project replaces 175 million kWh per annum of grid- supplied energy power from coal. The project sponsors charged the Tieta Group for electricity at the rate of RMB1.378/kWh for the first 20 years, and RMB0.32/kWh for the remaining 5 years. Total project investment is RMB1.15 billion (\$180 million) with 80% debt.

(iii) **Biomass Project (Advanced):** Renewable energy generation using advanced technology (high rate anaerobic digestion) from biomass with agriculture waste, including straw and manure from livestock. Over 25 years, the project would reduce the CO₂ emission by 79 million tons (\$3.2 / tCO₂) . The project also increases employment and household income by more than RMB16 million per year through straw acquisition and ancillary services and over 10,000 jobs.

Background:

Three county level towns in Shandong Province - Qingzhou, Gaomi and Caoxin awarded the project to Elon Group under a 30 years public private partnership contract to reduce the reliance on coal for energy production.

Proposed project:

The biomass from the wastes generates up to 140 million kWh of electricity per year from each of the three installations. The total project investment is CNY1.64 billion (\$255 million) with about CNY1.15 billion (\$179 million) total debt.

F.3. Environmental, Social Assessment, including Gender Considerations

The Programme is classified *financial intermediary* by ADB. An ESMS (Annex 6 disclosed on 22 June 2018 in English and in Chinese on ADB website and available in hard copy at SDIHG) is developed to meet national laws and requirements of ADB's Safeguard Policy Statement (SPS) 2009. The ESMS provides guidance on (i) screening, categorization, and review of projects; (ii) organizational structure and staffing, including skills and competencies in environmental and social areas; (iii) capacity building; and (iv) monitoring and reporting. SGDF will be responsible for implementing the ESMS. The ESMS excludes projects of *category A and B sensitive for Environment* from financing by SGDF. For Category B Environment, an IEE is prepared and reported to ADB through the yearly ESMS report, included into the APR. For Category C Environment without environmental impact, only the categorization form is required.

Under ADB SPS 2009, there is no difference in documentation required for Category A or B for Involuntary Resettlement with a trigger set at 200 affected people. Category A Resettlement requires a higher level of approval; most infrastructure projects in general and urban infrastructure projects in particular are categorized A for resettlement. Under the ESMS, Category A and B resettlement plans are reported to ADB through the ESMS annual reports, included into the APR.

Social impacts are undertaken for each subproject financed by SGDF irrespective of categorization in order to provide a baseline to report against. The data needs to be disaggregated by sex and identifies vulnerable people in the project area.

The budget for the ESMS is funded by the FMC but recharged to the project sponsors through an upfront fee covering the cost of screening, project preparation, ESMS, M&E and reporting. The initial cost is funded out of the technical assistance program funded by ADB Loan.

The Programme is classified Effective Gender Mainstreaming (refer to Section E.3.1); a Gender Action Plan is included in Annex with the ESMS. Each subproject requires a gender analysis as part of the baseline and a gender action plan funded under the subproject. The M&E reporting needs to track the gender indicators in the Outcome and the Outputs. ADB Review Missions focuses on social development, gender and safeguards at least once a year.

F.4. Financial Management and Procurement

The financial management assessment³⁴ was conducted following ADB's Financial Management and Analysis of Projects.³⁵ The assessment covers financial and legal status, accounting staffing, accounting policies and procedures, fund flow arrangements, financial reporting and monitoring procedures and practice, financial management information systems in place, and requirements, guidelines and results of internal and external audits. The results for SGDF showed that the financial management systems and procedures put in place based on SDIHG systems and procedures meet ADB requirements. The external audit reports from 2015 – 2017 for SDIHG have unqualified opinion. SDIHG as a large SOE and a preferred infrastructure investment vehicle for Shandong Province, fully complies with the regulator's prudential regulations, and is under constant monitoring by the State-owned Assets Supervision and Administration Commission. The financial management risks before mitigation were assessed to be moderate considering that SGDF is a new entity even though it benefits from the professional and financial management expertise of SDIHG.

Disbursement. Disbursement will follow ADB's Loan Disbursement Handbook (2017, as amended from time to time) and detailed arrangements agreed upon between the Government and the ADB. Training for FMC staff on disbursement policies and procedures is available online.³⁶ Staff are encouraged to avail of this training to help ensure efficient

³⁴ The Financial Management Assessment Questionnaire with answers is included in Annex 16.

³⁵ ADB. 2005. *Financial Management and Analysis of Projects*. Manila; ADB. 2009. *Financial Due Diligence: A Methodology Note*. Manila; ADB. 2015. *Financial Management Technical Guidance Note: Financial Management Assessment*. Manila

³⁶ Disbursement eLearning. http://wpqr4.adb.org/disbursement_elearning

disbursement and fiduciary control. Pursuant to ADB's Safeguard Policy Statement (2009, as amended from time to time), ADB funds may not be applied to the activities described in ADB's Prohibited Investment Activities (refer to Loan Agreement) and the Multilateral Development Banks and the International Development Finance Club. SDIHG and the cofinanciers will also ensure that SGDF's investments comply with all applicable national laws and regulations.

Loan Proceeds Re-invested. SDIHG shall cause SGDF to re-lend or redeploy all repaid principal during its reinvestment period to make further investments in subprojects, as quickly as feasible after amounts due to the IFIs, LPs and FMC are repaid or distributed.

Accounting. SPG will maintain separate accounts, including foreign currency withdrawal accounts (USD and Euro). SDIHG will maintain Chinese Yuan Conversion Account (CCA) to finance SGDF as a LP. . The FMC will maintain the accounts at SGDF including Revolving Fund Account and accounts for any funds established under SGDF and prepare an annual consolidated statement of utilization of funds³⁷ (SUF) for the Project in accordance with accounting principles acceptable to ADB. Furthermore, to ensure the smooth implementation of the Financial Intermediary Loan, SDIHG shall not exceed the maximum of 70% of total liabilities to total assets ratio, which will be monitored by ADB before loan closure and ADB shall have the right to request SDIHG to take correction actions if it does not meet the requirement.

In addition to the annual SUF, the FMC shall provide to ADB its annual financial statements prepared in accordance with financial reporting standards acceptable to ADB.

Auditing. The FMC will cause the annual consolidated SUF to be audited annually in accordance with international standards on auditing and with the Government's audit regulations, or with auditing standards acceptable to ADB, by an independent auditor whose qualifications, experience and terms of reference are acceptable to ADB. SDIHG shall seek ADB's no objection for the selection of the auditor. The audited SUF together with the auditor's report will be furnished in the English language by the FMC to ADB within 6 months after the close of the fiscal year to which they relate.

The audit report for the SUF will include a management letter and auditor's opinions, which cover (i) whether the Programme's financial statements present an accurate and fair view or are presented fairly, in all material respects, in accordance with the applicable financial reporting standards; (ii) whether the proceeds of the loan were used only for the purposes of the Programme; and (iii) whether SGDF is in compliance with the green and financial covenants contained in the legal agreements.

Public disclosure of the annual audited SUF for the Programme, including the auditor's opinion on the statements, will be guided by ADB's Public Communications Policy 2011. After the review, ADB will disclose the audited SUFs and the opinion of the auditors on the statements no later than 14 days after ADB's confirmation of their acceptability by posting them on ADB's website. The management letter, additional auditor's opinions, and audited FMC and the Account Bank entity financial statements will not be disclosed.

ADB's Anticorruption Policy will be included in the loan regulations and the subprojects documents for the Programme. In particular, all contracts financed by the IFIs in general and ADB in particular in connection with the Programme shall include provisions specifying the right of ADB to audit and examine the records and accounts of the EA/IA and all contractors, suppliers, consultants, and other service providers as they relate to the Programme.

A procurement capacity assessment concluded that the overall procurement risk for the project is moderate. While SDIHG is an experienced company, the Programme is the first externally-financed development Programme for SGDF. SDIHG confirmed that SGDF will benefit from their advice and support throughout the implementation of the

³⁷ In the case of financial intermediation loans, an audited SUF will be submitted in lieu of the audited project financial statements. The audited SUF will indicate: (i) the opening balance; (ii) the name of financial intermediary; (iii) details of sub loans; (iv) closing balance; (v) comparative figures for prior year; and (vi) cumulative amount to date. The audited SUF will also be accompanied by adequate explanatory notes which will include the basis of preparation, reporting currency, undrawn external assistance, and details of sub loans such as amounts committed, disbursed up to the previous year, disbursed during the current reporting period, cumulative disbursement, undisbursed commitments, percentage of loan utilized, etc.

Programme. All procurement to be financed under the Programme, through the ADB and GCF loan, must be carried out in accordance with ADB's procurement policy and regulations for Financial Intermediary. Procurement including the recruitment of consultants under the TA Program must follow ADB Procurement Policy (2017, as amended from time to time) and Procurement Regulations for ADB Borrowers (2017, as amended from time to time). Procurement activities will be the responsibility of SDIHG and subsequently FMC after its establishment.

Procurement under FI loan will be undertaken by the respective beneficiaries in accordance with established private sector or commercial practices, which are acceptable to ADB. Respective beneficiaries may use Open Competitive Bidding (OCB) for the purchase of large single items or in cases where large quantities of like goods can be grouped together for bulk purchasing. All the procurement under FI loan will ensure (a) reasonable prices as a result of preferably competitive procedures, (b) procurement from eligible source countries, and (c) fair canvassing and/or evaluation when selecting suppliers

Green Procurement follows the Green Procurement Guidelines issued by the European Union. A summary of Green Procurement is included in Annex 13.

G.1. Risk Assessment Summary

The level of key risks that will affect the Programme's performance are, in ABD's experience, generally moderate and expected to be mitigated to a substantial degree by ADB's established operational tools and control mechanisms. Key risks to this Programme are policy consistency, financial management capacity (including currency mismatch), compliance to GCF and ADB procurement rules and policies and environmental and social risks. The SGDF is an extension of the ADB's recent experience in such facilities in PRC, with the ADB's financed Air Pollution Program for Beijing-Tianjin-Hebei undertaking similar investments, albeit not structured to leverage PIC funding.

G.2. Risk Factors and Mitigation Measures

Selected Risk Factor 1 Risk at the Fund level

Description	Risk category	Level of impact	Probability of risk occurring
Financial Management Capacity: SGDF manages several loans with different terms and conditions. SGDF needs to increase PIC funds at the Fund level.	Financial	Low (<5% of project value)	Low
Implementation: SGDF's Operation requires policy consistency and effective coordination, which is always difficult for greenfield structure, and the preparation of a pipeline of bankable projects.	Technical and operational	Medium (5.1-20% of project value)	Low
Impact & Delivery: The Programme is dedicated to finance a majority of transformational and advanced benefits projects, which may not deliver the anticipated full benefits due to higher risk. Investment in sub-funds may generate governance issues.	Financial	Medium (5.1-20% of project value)	Medium

Mitigation Measure(s)

Financial Management Capacity: SGDF is established under an experienced financial intermediary, SDIHG, which is acting as General Partner and part of the Management Company of SGDF.

Implementation: Inclusion of a private company, as co-General Partner assist SGDF to deliver on the implementation of the Fund. Streamlined and harmonized Fund management guidelines are developed including capacity development under the TA program and a robust M&E system. The TA also resources the project development component of the Facility that will be the underpinning of a quality project pipeline.

Impacts & Delivery: A comprehensive M&E and verification system is developed with strong Information Technology features to better track the progress of the selected indicators in quasi real time. Key climate related and financial indicators are included as loan covenants for monitoring. Calculated CO₂ emission reductions are conservative, only based on already identified projects (about 55%) with outliers excluded from the calculation. All the terms and conditions of GCF and co-financiers are mandatory for the sub-funds.

Selected Risk Factor 2 Risks at the Project level

Description	Risk category	Level of impact	Probability of risk occurring
Project indicators: Climate related indicators are new and will be applied to each project financed by SGDF	Technical and operational	High (>20% of project value)	Low
Procurement: While procurement procedures complies with ADB Procurement Guidelines. SGDF is introducing a new Green Procurement system to improve the climate resilience of projects to be financed by SGDF.	Technical and operational	High (>20% of project value)	Low
Environmental and Social: SGDF is implementing an ESMS with enhanced procedures compared to national regulation.	Social and environmental	Medium (5.1-20% of project value)	Low

Mitigation Measure(s)

Project Indicators: SGDF assisted by the Technical Assistance Program screens projects against climate related indicators (as well as financial indicators) to make sure that most of the projects selected for financing by SGDF are climate resilient and mostly transformative or advanced practices.

Procurement: Green Procurement policy based on European Union Guidelines are integrated into SGDF procedures, but are applied selectively and on a voluntary basis. Training will be provided during loan processing by the ADB project preparation team.

Environmental and Social Safety: The ESMS is enforced with the support of the Technical Assistance Program. No projects categorized A Environment (as per ADB Safeguards Policy Statement, 2009) can be financed by SGDF with ADB and cofinanciers loans. A dedicated safeguard and social development specialist is recruited within SGDF.

Selected Risk Factor 3 Foreign Exchange Risk

Description	Risk category	Level of impact	Probability of risk occurring
While revenues such as tariff and user fees are collected in local currency, the GCF, ADB and other co-financier loans are denominated in hard currency. Thus, the burden of making payments to the GCF may be significantly affected by foreign exchange fluctuations.	Financial	High (>20% of project value)	Low

Mitigation Measure(s)

Beneficiaries' sensitivities to increases in interest rates and local currency movements are closely monitored by ADB in projects' due diligence, implementation and repayment. However, in the medium term, prospects for the RMB are likely to be biased towards currency revaluation, thus benefiting borrowers. Mechanisms to address potential exposure to the increased costs associated with foreign exchange risks will be evaluated on a project by project basis. Such measures to address these risks can include support from municipal or national level authorities and tariff evaluations.

Local currency financing is very important since most clients are expected to generate income only in local currency. ADB has provided local currency loans to municipalities and corporate clients where it is able to source local currency at competitive rates for non-sovereign projects. However, this approach has shown mixed results because while local currency loans do mitigate exchange rate risks, clients still face interest rate risks with a volatility of interest rate usually greater in local currencies than in foreign currencies. Over the period of the Programme therefore, ADB will therefore seek to evolve local currency instruments and promote them prudently, distinguishing between clients able to apprehend and manage macro-risks and those that should be protected through both currency and interest rate hedging.

Later phase financing in local currency, where feasible, will also mitigate foreign exchange risks. By matching the Programme's currency to that of local revenues, beneficiaries will be able to reduce their exposure to potential fluctuations in the value of local currencies that could impair a borrower's ability to service a loan.

Availability payments (AP)- often the main source of revenue for debt service for PPPs- will be adjusted for the foreign exchange fluctuations in excess of inflation. This will be done through a foreign currency adjustment mechanism included in the payment mechanism. The effect of exchange rate risk is also partially mitigated by a hard currency "floor price" for the APs where APs expressed in foreign currency have a minimum throughout the term of the concession, so in any calculation date the APs cannot be lower than previous APs in hard currency.

The credit risk as well as the FX risk are assumed by the PRC – and passed on to SDIHG through the Shandong Provincial Government.

SDIHG is a large fund owned by Shandong Government with assets worth of more than USD 3.5 billion and with high degree of solvency. The Group will as such not have problems taking on the IFIs loans to its balance sheet. Total liabilities to balance is projected to remain below 25% when all the IFIs' funding is disbursed by 2023

Selected Risk Factor 4 Political Risk

Description	Risk category	Level of impact	Probability of risk occurring
Changes in tariffs and user fees will help to ensure the financial sustainability of the Programme but may prove	Other	High (>20% of project value)	Low

politically unattractive for mayors and local governments to adopt particularly with respect to re-election.			
Mitigation Measure(s)			
ADB mitigates this risk in the following ways. First, where appropriate, requiring tariff and other charge increases once the investment project is fully implemented thus allowing users to realize the benefits. Second, by respecting affordability constraints and ensuring mechanisms are in place to ensure that low income groups are provided with financial assistance if affordability thresholds are breached. Third, by combining tariff or other charge increases with measures to improve the overall operating efficiency of borrowing companies, which should have a positive impact on costs.			
Selected Risk Factor 5 Financial Risk			
Description	Risk category	Level of impact	Probability of risk occurring
Inability of the cities or borrowing entities to service the loan.	Financial	High (>20% of project value)	Low
Mitigation Measure(s)			
ADB's comprehensive due diligence and technical support will mitigate the risk that the borrower may have an inability to service the loan due to insufficient net operating cash flow to meet the debt service. TA provided under the Project Preparation Facility will help cities and other borrowers to both structure their obligations appropriately and to improve their operational and financial performance.			
Selected Risk Factor 6 Environmental and Social Risk			
Description	Risk category	Level of impact	Probability of risk occurring
Beneficiaries' limited capacity to comply with national regulations and/or ADB and GCF environmental and social policy requirements.	Social and environmental	Low (<5% of project value)	Low
Mitigation Measure(s)			
Environmental and social studies required to conform with the ESMS process (see above) will identify potential issues and mitigation measures. The Shandong government and its implementing agencies (including the precursor institution to the SGDF) have implemented required policies in a thorough manner.			
Other Potential Risks in the Horizon			
No other significant risks identified.			

H.1. Logic Framework.

H.1.1. Paradigm Shift Objectives and Impacts at the Fund level ³⁸

Paradigm shift objectives							
<p><i>Shift to low-emission sustainable development pathways</i></p> <p><i>Increased climate resilient sustainable development</i></p>	<p>Scaling Up and Replication are inherent in the Programme design in that it is a scalable mechanism for investment in climate change mitigation and adaptation. At the project level, this will be incentivized by the ranking system for designing and selecting climate resilient subprojects that have a well-designed strategy and financing for upscaling – including building additional facilities, on-the-job training and strengthening of institutions. Improving performance under this criterion involves higher levels of upscaling across a broader geographic area. The viability of such upscaling is assessed by the Programme development team and through the SGDF's technical assistance during implementation. Specific values for scaling up and replication are provided, for instance a 30 MW hydroelectric power station that can be replicated at four different specific sites in the region.</p> <p>Innovation is promoted by the ranking system that, as a baseline requires that the Programme demonstrates such innovation, canvassed appropriate, available technical and financing options available and selected optimum options given client needs and capacities. The Programme development activities encourage project designs that demonstrate state-of-the-art integrated systems for planning, financing and / or operations capable of driving synergies across investment sectors that will, in turn, enable greater impact per unit input in terms of mitigation and / or adaptation benefits, economic and environmental co-benefits, and / or upscaling / replication. The TA program strengthens innovation through design – review – advice iterations and climate / green ratings in addition to the conventional financial rating.</p> <p>The Programme improves the enabling environment for climate finance through the creation of an investment pipeline for climate finance and a linkage between project finance and long-term capital market instruments such as Green Bonds. Given that the model is based on the achievement of commercial returns in the medium term, the Programme is both sustainable and scalable. Initial catalytic finance can be later replaced by extending the input of private finance and hence ensure the sustainability of the SGDF. Thus, the outcomes and results of the SGDF can be upscaled and replicated in other PRC Provinces and then in other countries through ADB lending program.</p> <p>The Programme addresses systematic barriers to financing low-carbon and climate resilient solutions specifically by reducing transaction costs and risks for climate resilient projects. In relation to improving the regulatory framework and policies relating to targeted investments, the combination of the Programme development and knowledge mechanisms of the SGDF support input to policy dialogue, as to provide a better enabling environment for better government programs and projects. The objective is to help establish regulatory frameworks that provide incentives and funding to undertake focused, integrated and sustained multi-sectoral investments for climate change mitigation and adaptation.</p>						
	Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
					Mid-term 2028	Final 2048	
Fund-level impacts							
<i>Reduced emissions through low emissions power generation, transport and building projects</i>	<i>Tons of carbon dioxide equivalent (t CO2eq) reduced as a result of Fund-funded projects/ programmes</i>	<i>MEV Contractor Annual Reports</i>	<i>0</i>	<i>20 million</i>	<i>50 million</i>	<i>Over 30 years: Most invested projects operate for 25 years, excluding 5 years for</i>	

³⁸ Information on the Fund's expected results and indicators can be found in its Performance Measurement Frameworks available at the following link (Please note that some indicators are under refinement): http://www.gcfund.org/fileadmin/00_customer/documents/Operations/5.3_Initial_PMF.pdf

						approval and construction time.
	<i>Cost per t CO₂eq decreased for all SGDF funded mitigation projects/ programmes</i>	<i>MEV Contractor Annual Reports</i>	<i>Tbd</i>	<i>\$30</i>	<i>\$20</i>	SGDF over time will reduce cost per t CO ₂ eq; methodology and calculations will be provided by the MEV contractor to SGDF management annually for investment decision-making.
<i>Increased Resilience through adaptation projects</i>	<i>Total Number of direct and indirect beneficiaries; Number of beneficiaries relative to total population</i>	<i>MEV Contractor Annual Reports</i>	<i>0</i>	<i>4 million direct (4%) 10 million indirect (50% women)</i>	<i>10 million direct (10%) 25 million indirect (50% women)</i>	<i>Vulnerable/beneficiary groups and women are effectively targeted and disaggregated in reporting.</i>
<i>Fund Leverage</i>	<i>Volume of finance leveraged by Fund funding</i>	<i>SGDF - semi-annual Financial Reports</i>	<i>0</i>	<i>\$1 billion</i>	<i>\$7.5 billion</i>	Private sector to invest in each project in equal or greater amounts than the SGDF investment (expected up to 50% for Transformational projects).

H.1.2. Outcomes, Outputs, Activities and Inputs at Project/Programme level						
Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term 2028	Final 2039	
Programme Outcomes	Outcomes that contribute to Fund-level impacts					
<i>Component 1 Financing of low emission investments – increased number of mitigation projects implemented</i>	CO ₂ emission reduction (Incremental)		01 million ton/year	2 million ton/year	Over 2 million ton/year	Subprojects meet their intended climate outputs
	<p>GCF indicators:</p> <p>6.1 Proportion of low-emission power supply in a jurisdiction or market</p> <p>7.1 Energy intensity/ improved efficiency of buildings, cities, industries and appliances.</p> <p>8.2 Improved vehicle fuel economy and change in energy source</p> <p>Other indicators of GHG impact as necessary</p>	Government reports Annual Performance Report (APR)	(tbd)	(tbd)	(tbd)	
	% of mitigation subproject (components) meeting projected emissions reduction		0	70%	90%	
<i>Component 1 Financing of resilience investments – increased number of adaptation projects implemented</i>	Number of beneficiaries with increased resilience due to infrastructure investments and better knowledge to deal with climate changes (disaggregated by gender)		1.75 million	3.5 million	10 million	Projects meet their intended climate outputs
	<p>GCF Indicators:</p> <p>1.1 Change in expected losses of lives and economic assets (US\$) due to the impact of extreme climate-related disasters</p>	Government reports APR	(tbd)	(tbd)	(tbd)	

	% of adaptation subproject (components) meeting projected beneficiary projections		0%	70%	90%	
<p><i>Components 2, 3 and 4 Strengthened institutional and regulatory systems –</i></p> <p><i>Strengthened capacity to support the development of projects on a sustainable basis</i></p> <p><i>Successful capacity development & training strengthens SGDF capacity to undertake green financing</i></p> <p><i>Availability of and access to timely, relevant and accurate information on green project portfolio by stakeholders</i></p> <p><i>Internationally recognized Green rating system successfully established and used by SGDF to leverage PIC finance</i></p> <p><i>Effective Policy Reform supported and included in Provincial Plan</i></p>	<p>Component 2 Sustainable Project Preparation Facility established</p>	<p>Financing of 3 subprojects prepared by the facility successfully concluded with mechanisms to recover cost of preparation – from APR</p>	0	1	3	<p>TA component is fully funded and effective</p>
	<p>Component 3 Capacity Development Sub-Component 3.1 – successful capacity development & training strengthens SGDF</p>	<p>Training evaluations reflect 70 percent agreement as to utility of training and materials such as guidelines – from APR</p>	0	50%	70%	
	<p>M&E Sub-Component 3.2 – effective M&E system established strengthens SGDF capacity for monitoring and reporting</p>	<p>M&E systems routinely used by SGDF to monitor and report on projects – from APR</p>	0	1	1	
	<p>Green Rating system Sub-Component 3.3 internationally recognized Green rating system successfully established</p>	<p>Rating cited by 2 PIC financiers as important to their decision to invest – from APR</p>	0	0	1	
	<p>Component 4 Effective Policy Reform supported</p>	<p>Provincial 5Y plan reflects policy recommendation (from APR)</p>	0	1	1	
<p>Programme outputs by Component and sub-Component No</p>	<p>Outputs that contribute to outcomes</p>					
<p>Component 1</p>						
<p>1. Increased number of mitigation and adaptation projects accessing private, institutional and commercial funds leveraged by the Programme</p>	<p>Financing amounts as set out in subproject financing plans</p>	<p>Project financing amounts as disclosed in subproject agreements for funds disbursed by</p>	0	\$1 billion	\$7.5 billion	<p>PIC funding has appetite for climate resilient subprojects funded by SGDF</p>

		SGDF(from APR)				
Component 2						
2. A sustainable project preparation facility	Subprojects formulated	From APR	0	1	3	TA resources effectively deployed and supervised
Component 3						
3.1 - Trainings and guidelines for fund operation	Successful Workshop evaluations as reported in APR	As above (disaggregate inputs and outputs by gender where appropriate)	0	2	4	As above
3.2 - Effective M&E system established	Projects on M&E system used by SGDF	M&E reports disaggregated by sector and gender – from APR	0	10 subprojects on system	All SGDF subprojects on system	
3.3 - Green Rating System established	Rating Reports issued by project sponsors	Rating reports – from APR	0	10 Reports	15 Reports	
Component 4						
4. Workshops and policy papers to inform next Provincial Five Year Plan on identifying policy constraints and recommended initiatives	Policy documents from roundtables used in 5 Year plans (minimum 3)	As reported in APR (for workshop participation by gender)	0	1	3	
Activities (by Component no and Activity no.)	Description		Inputs		Description	
Component 1						
1.1. establish and staff SGDF core financial management	Establish SGDF as institution and hire core staff		SGDF staff deployed		Core fund management staff in place	
1.2 enter into agreement with experienced GP to strengthen core team	Draft partnership agreement, tendering and negotiate with qualified managers		SGDF staff in place to run process I		Competitive bidding	
1.3. undertake assessment of subproject proposals under green criteria as needed and implement required financing structures	Conduct due diligence on subprojects and document approvals Enter into loan / equity finance and other agreements as necessary		Financial resources and technical expertise deployed		GCF, ADB, other cofinanciers and SPG/local government pay in funds. Project development process provides inputs to sponsors.	
1.4. undertake financing of subprojects assessed as qualifying and monitor compliance with SGDF covenants and requirements	Maintain fund management and ES monitoring systems and report to management on outcomes		Financial resources and technical expertise deployed		As above plus private sector financing input to fund and projects.	
Component 2						
2.1. establish and staff project preparation facility	Establish organizational structure and processes for project preparation facility, procure DRA consultants.		Staff deployed		Key staff to oversee the facility in place. See draft TOR??	

2.2. undertake design and financial structuring support of project sponsors as needed and develop required financing proposals, support green procurement	Assess eligibility for project development assistance based on Fund criteria Enter into finance / reimbursement agreements as necessary Document outcomes of project development activities and report to management, Develop Green Procurement documents.	Financial resources and technical expertise deployed	Excise project development resources from fund corpus and field TA consultants to assist project sponsors in project development.
Component 3			
<u>Sub-Component 3.1</u>			
3.1.1 progressively document process and assess capacity development needs	Assign focal point for capacity development coordination, develop TOR and procure consultants	Staff resources deployed	Key staff to oversee capacity development in place. See draft TOR??
3.1.2. design, organize and carryout training workshops	Identify key staff and stakeholders Undertake workshops Document outcomes and disseminate	Staff and TA resources deployed	Field TA consultants to support SGDF in building capacity.
<u>Sub-Component 3.2</u>			
3.2.1. establish and staff project assessment and monitoring groups of SGDF	Assign M&E core staff, develop TOR and procure consultants	Staff and TA resources deployed	Key staff responsible for development and operation of M&E systems in place
3.2.2 undertake M&E systems design and rollout, progressively documenting financing process and outcomes	Design M&E systems Implement the systems Train SGDF staff in use of systems	Staff and TA resources deployed	Field TA consultants to support SGDF in building M&E systems and rollout.
<u>Sub-Component 3.3</u>			
3.3.1 establish and nominate staff responsible for Green Rating	Design green Rating procurement Implement procurement Oversight design of rating system Oversight rating of 15 projects	Staff deployed	Key staff responsible for development and operation of Green Rating systems in place
3.3.2 establish Green Rating system	Design of rating system Train SGDF staff in use of system Undertake rating of 15 projects Publish and disseminate results of Rating	Staff and TA resources deployed	Field TA consultants to support SGDF in building M&E systems and rollout.
Component 4			
4 undertake yearly policy roundtables involving private sector, government and financiers focused on identifying policy constraints and recommended initiatives	Identify key stakeholders Undertake workshops Document outcomes and disseminate Undertake policy dialogue based on workshop outcomes	Staff and TA resources deployed	Field TA consultants to support SGDF capacity to provide policy input.

H.2. Arrangements for Monitoring, Reporting and Evaluation

Programme Performance Management System; Gender; and Environmental and Social Management System: SGDF brings a systematic performance monitoring and analyses throughout the life of the Programme. It is integrated within the Programme management information system (refer to Annex 11).

The Project performance is monitored through the program performance management system (PPMS). The estimated loan closing date is 30 June 2039 (ADB & GCF) and the Project completion date 31 December 2039 (ADB & GCF). The FMC will establish the PPMS in a form acceptable to ADB to monitor the progress in project implementation during the first 12 months following loan approval. The PPMS ensures the monitoring of project's impacts, outcomes and outputs with respect to the climate and financial performance targets, ESMS and Gender set forth in the Programme Framework. The PPMS is integrated within the M&E information system being developed under the project preparation. Comprehensive project preparation of infrastructure projects is monitored through SOURCE³⁹ digital platform available at no cost to SGDF.

Reporting: During the loan implementation period, the FMC will prepare semi-annual progress reports in a format acceptable to ADB and submit these reports within 30 days of the end of each semi-annual period. One of the two progress report will follow the template of the Annual Performance Report of the GCF (as amended from time to time). The other semi-annual report will provide: (a) progress achieved by output as measured through the indicator's performance targets in the DMF (b) key implementation issues and solutions (c) an updated lending and disbursement plan and (d) updated implementation plan for the next 6 months; (ii) consolidated audited and entity financial statements; (iii) semiannual environmental and social monitoring reports, including subprojects' environmental management plans; and (iv) a PCR within 6 months of physical completion of the project. The reports are disclosed in ADB website as per ADB Public Communication Policy.

Monitoring: ADB and the Government will review the Programme implementation jointly at least twice a year during the first 5 years of the loan implementation and at least once a year thereafter from year 6 to 10. From year 11 to 20, the FMC will continue to submit APR and ADB will go on mission as required. Review missions are explained in Section C7. Details of the content and reporting for the missions are included in the Project Administration Instructions (footnotes 26 & 27).

Evaluation: Within 3 months after the end of grace period of the project, SGDF will submit a Project Completion Report (PCR) to ADB. This report will then be the basis for a joint evaluation of the Project conducted by SGDF and ADB during a Project completion review mission to be conducted by ADB. The co-financiers of the Project will join review missions as required.

The FMC shall engage an accredited agency or agencies acceptable to ADB to undertake, within 6 months after the physical completion of each subproject, measurement and verification of the reduction in emissions of CO₂ achieved by such subproject and shall provide to ADB the consolidated results of the measurement and verification of such savings and reductions of all physically completed subprojects, with reference to the emissions baseline established before the project implementation and from time to time at ADB's request.

³⁹ An innovative information technology platform designed to speed up the delivery of infrastructure projects. It is designed to help public sector agencies prepare, manage and publish their infrastructure projects and to attract private sector investment. This cloud-based system (under UN servers) allows to present information on infrastructure project in a transparent and efficient manner, using sector-specific templates. SOURCE is managed by the Sustainable Infrastructure Foundation, a not-for-profit Swiss Foundation. <http://sif-source.org>

I. SUPPORTING DOCUMENTS FOR FUNDING PROPOSAL

- Annex 1. NDA No-objection Letter (Mandatory)
- Annex 2. Pre-Feasibility Study (Mandatory)
 - 2.1 Large Scale Biomass Delivers Decarbonization and Improves Urban- Rural Linkages
 - 2.2 Transformative Energy Management for Zero Waste at Expressway Service Centers
 - 2.3 Solar Smart-Grid for Inclusive Access to Information Communication Technology
- Annex 3. **CONFIDENTIAL** (Integrated Financial Model) (Mandatory)
- Annex 4. Confirmation letter for co-financing (AFD and KfW)(Mandatory)
 - 4.1 Letter of Intent for Co-Financing AFD
 - 4.2 Letter of Intent for Co-Financing KfW
- Annex 5. Initial Draft Term Sheet and Disbursement Schedule
 - 5.1 Disbursement Schedule
 - 5.2 **CONFIDENTIAL** (Initial Draft Term Sheet)
- Annex 6. Environmental and Social Management Plan (Mandatory):
 - 6.1 ESMS English Version
 - 6.2 ESMS Chinese Version
 - 6.3 ESS Report Form ADB
 - 6.4 Gender Action Plan
 - 6.5 Initial Poverty and Social Analysis
- Annex 7. Map indicating the location of the project/programme (Mandatory)
- Annex 8. Timetable of project/programme implementation (Mandatory)
- Annex 9. SGDF Transaction Assessment Guidelines
- Annex 10. Infrastructure Sector Assessment for PRC
- Annex 11. Monitoring, Evaluation and Reporting
- Annex 12. Project Concept Notes
- Annex 13. Green Procurement
- Annex 14. Green Finance Indicators
 - 14.1 Indicators for Green Finance in China (ADB. 2018. TA8606-REG. Manila)
 - 14.2 Mitigation and Adaptation Priorities in Shandong (ADB. 2018. TA9398-PRC. Manila)
- Annex 15. **CONFIDENTIAL** (AE Fees Request Budget)
- Annex 16. **CONFIDENTIAL** (Financial Management)
- Annex 17. **CONFIDENTIAL** (Draft Addendum to Funding Proposal for Trancheing)

SUPPORTING DOCUMENTS NOT APPLICABLE FOR THIS PROPOSAL:

- Appraisal Report or Due Diligence Report with Recommendation
- Evaluation Report of the baseline project



** Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*

No-objection letter issued by the national designated authority(ies) or focal point(s)

中华人民共和国财政部
Ministry of Finance, P.R.China

Ministry of Finance, People's Republic of China
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To: The Green Climate Fund
through Asian Development Bank (Accredited Agency)

Beijing, 20 June 2018

**People's Republic of China: No-objection Letter
Catalyzing Climate Finance (Shandong)
for Green Climate Fund consideration at Board B21**

Dear Madam, Sir,

We refer to the programme, Catalyzing Climate Finance (Shandong), People's Republic of China (PRC) as included in the funding proposal submitted by Asian Development Bank, as Accredited Agency to us on 8 June 2018.

The undersigned is the duly authorized representative of Ministry of Finance, Mr. Chen Shixin, the National Designated Authority of PRC.

Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the programme as included in the funding proposal.

By communicating our no-objection, it is implied that:

- (a) The government of PRC has no-objection to the programme as included in the funding proposal;
- (b) The programme as included in the funding proposal is in conformity with PRC's national priorities, strategies and plans;
- (c) In accordance with the GCF's environmental and social safeguards, the programme as included in the funding proposal is in conformity with relevant national laws and regulations.

We also confirm that our national process for ascertaining no-objection to the programme as included in the funding proposal has been duly followed.

We also confirm that our no-objection applies to all projects or activities to be implemented within the scope of the programme.

We acknowledge that this letter will be made publicly available on the GCF website.

Kind regards,



Mr. Chen Shixin
Director General of Department of International Economic and Financial Cooperation
Ministry of Finance, PRC

Environmental and social report(s) disclosure

Basic project/programme information	
Project/programme title	Catalyzing Climate Finance (Shandong)
Accredited entity	Asian Development Bank
Environmental and social safeguards (ESS) category	Category I-1
Specific project location or target country/ies of the programme, as the case may be	Shandong Province, People's Republic of China (PRC)
Environmental and Social Impact Assessment (ESIA) (if applicable)	
Date of disclosure on accredited entity's website	N/A
Language(s) of disclosure	N/A
Link to disclosure	N/A
Other link(s)	N/A
Environmental and Social Management Plan (ESMP) (if applicable)	
Date of disclosure on accredited entity's website	2018-06-22
Language(s) of disclosure	N/A
Link to disclosure	N/A
Other link(s)	N/A
Resettlement Action Plan (RAP) (if applicable)	
Date of disclosure on accredited entity's website	N/A
Any other relevant ESS reports and/or disclosures (if applicable)	
Description of report/disclosure	2018-06-22
Language(s) of disclosure	English and Chinese
Link to disclosure	English https://www.adb.org/projects/documents/prc-51194-001-esms Chinese https://www.adb.org/zh/projects/documents/prc-51194-001-esms An ESMS consistent with the requirements for a category I-1 programme is contained in the Environmental and Social Management System Arrangement (Draft).
Other link(s)	https://www.adb.org/projects/51194-001/main
Disclosure in locations convenient to affected peoples	
Date	22 June 2018
Place	Shandong Development and Investment Holding Group, Jinan, Shandong Province, PRC

Note: This form was prepared by the accredited entity stated above.

Secretariat's assessment of FP082

Proposal name:	Catalyzing Climate Finance (Shandong Green Development Fund)
Accredited entity:	Asian Development Bank (ADB)
Country/(ies):	People's Republic of China
Project/programme size:	Large

I. Overall assessment of the Secretariat

- The funding proposal is presented to the Board for consideration with the following remarks:

Strengths	Points of caution
<p>The project will have large impact potential and is conservatively estimated to reduce 2 metric tonnes of carbon dioxide (MtCO₂) annually, or 50 MtCO₂ in the lifetime of the first generation of projects, in the province in China with the highest energy consumption and coal intensity.</p> <p>The investment criteria, with quantitative and qualitative benchmarks and three rating categories, mirrors GCF investment criteria and aims to maximize the impact of investments</p>	<p>Concessionality from GCF financing needs to be passed down to projects, rather than captured by intermediaries, whether public or private. According to the financial model, using the interest rates, financial structure and cost of capital assumptions presented in the funding proposal, there is little or no risk of capturing the concessionality</p>
<p>There is strong paradigm shift potential, particularly in the transformational finance (most relevantly, private finance) allocation mechanisms in renewable energy, to focus on transformation, impact and leveraging effect</p>	<p>It is important that a minimum amount of private sector financing volume is mobilized at the Shandong Green Development Fund (SGDF) level</p>
<p>Technical assistance funded by the Asian Development Bank (ADB) will finance a project preparation facility and contribute to enhancing the quality of projects at entry while independent bodies will develop and implement green ratings (with the potential to become an alternative to mainstream financial ratings) and conduct monitoring and evaluation</p>	<p>The facility supports long-term engagement between ADB with co-financiers and China to finance a new generation of green infrastructure projects with a higher risk profile; it is essential to understand and share the initial pipeline of transformational urban climate projects as a model for China and potentially for other such facilities globally</p>
<p>Co-financing of 7.3 times the GCF amount, with a financial structure that includes over USD 300 million from international and bilateral finance partners, such as ADB, Agence Française de Développement and</p>	<p>SGDF has no sectoral targets in terms of outcomes or funding allocations. GCF considers it adequate that SGDF remains flexible, as it should be able to react to market developments, for example, by not</p>

<p>Kreditanstalt für Wiederaufbau, another USD 375 million from the provincial government, and more than 600 million in private, institutional and commercial financing. Further crowd-in of private sector finance (equity, loans and re-financing after 5–7 years through capital markets) to achieve a leveraging ratio of 5:1 (USD 7.5 billion) through the programme’s 20-year lifespan</p>	<p>funding types of projects that become bankable without concessional financing. However, it is important that SGDF monitors and reports on the portfolio balance and acts as needed</p>
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2. The Board may wish to consider approving this funding proposal with the terms and conditions listed in the respective term sheet and addendum XVII, titled “List of proposed conditions and recommendations”.

II. Summary of the Secretariat’s assessment

2.1 Project background

3. The funding proposal aims to create a USD 1.5 billion climate finance facility, the Shandong Green Development Fund (SGDF). The primary goal is to catalyse finance, in particular private investment, to finance a portfolio of transformative mitigation and adaptation investments needed to implement the climate priorities established in Shandong province’s plans and policies. The initial funding will be provided by a mix of international finance institution loans – from GCF, the Asia Development Bank (ADB), Agence Française de Développement (AFD) and Kreditanstalt für Wiederaufbau (KfW) – provincial government funding, and private, institutional and commercial (PIC) finance.

4. SGDF aims to address financial, institutional and technical barriers to developing and funding high-quality mitigation and adaptation projects, specifically:

- (a) Limited availability of public finance – SGDF features inflows of PIC finance at both the facility and project level;
- (b) Reduced return on investment or higher risks of more climate-transformative investments, addressed through the provision of a level of concessionality and maturities – with potential re-financing – tailored to the project’s risk and return profile; and
- (c) Difficulties to identify and prepare transformative projects, addressed through a project preparation facility and the identification of key areas of transformation (e.g. sub-funds).

5. GCF is a high-profile partner in the facility not only as the provider of a key volume of concessional financing, but also as a model from which to define the investment strategy and criteria of SGDF, which aims to maximize mitigation and adaptation by making transformative investments bankable.

2.1.1. Climate objective

6. Shandong’s status as China’s top energy-consuming province and one of the most carbon-intensive (coal use being one of the major drivers) combined with its large industrial base and ambitious sustainable development legislation and mandate from the central Government make it an optimal target for the programme in terms of climate impact and transformational potential.

7. Investments will aim to maximize mitigation (75 per cent) and adaptation (25 per cent) impacts across several sectors, in line with Shandong's mitigation and adaptation policies. The climate impact will be ensured through the application of the investment criteria indicators of SGDF. The indicators are based on the GCF investment framework (most of them with sector-specific quantitative benchmarks tailored to China) and designed to promote projects with state-of-the-art levels of emission reductions and cost-efficiency within their sectors, high paradigm shift potential (in terms of innovation, knowledge generation, or creation of an enabling environment) and environmental, social and economic co-benefits. ADB will mandate 50 per cent of the fund's resources be allocated to advanced practice projects and 25 per cent to transformational projects achieving benefits exceeding current good practice in China.
8. Target portfolio allocations within mitigation and adaptation (see page 16 of funding proposal) are based on carbon emissions and potential beneficiaries. Due to SGDF being a Fund, allocation among sectors within mitigation and adaptation is not defined.
9. Due to the factors above, the Secretariat considers the SGDF investment strategy to be fully aligned with the GCF investment criteria and conducive to maximizing climate benefits. The quantification of investment criteria is an ambitious step based on available research, which may however fail to match the reality on the ground. It is recommended that initial benchmarks are revised in the first phase on the basis of the information available and expert judgment and alongside the indicators for green finance in China and underlying methodology detailed in annex 14.1.

2.1.2. Financing information

10. GCF will contribute USD 180 million to SGDF (12 per cent of the facility) through ADB and the Shandong government-owned Shandong Investment Holdings Group (SDIHG). Approximately USD 300 million will be provided by other international donors (USD 100 million from ADB; EUR 175 million from AFD and KfW), with USD 375 million from the provincial government, and the remaining USD 656 million to be contributed through private sources mobilized by SDIHG and Tongfang, a high-tech firm linked to Tsinghua University that will also invest as a key partner in the facility. The provincial government will cover any shortfall from the private sector side; however, the Secretariat understands that a high level of funding commitments has already been secured.
11. SGDF will provide concessional financing totalling between 10 and 40 per cent of the capex for the subprojects, based on the rating of the proposal against the investment criteria, resulting in a lower average cost of capital for projects achieving transformational/best practices (5.1 per cent) relative to those with merely good practices (5.8 per cent). This is considered a good mechanism to both promote projects of the transformational type, which may have higher upfront capex needs, and avoid crowding out private finance for non-transformational climate projects, which may have happened anyway with little or no need for concessional finance.
12. The remaining debt and equity finance will be provided by the project sponsors and the local financial landscape. It is expected to achieve a leverage ratio of 5:1; that is, USD 7.5 billion of private finance. SGDF will achieve leveraging of private finance from commercial and institutional investment at both the programme and project levels in the initial capitalization phase and further re-financing through capital markets after the SGDF exit (e.g. through green bonds).
13. SGDF tenors will be no longer than 10 years, after which the projects can be re-financed with PIC funds. This allows SGDF to target the higher-risk period of the projects and exit them once a steady commercial stage is reached, leaving them able to finance new projects.

14. All funds from GCF and other international finance institutions (IFIs) will be disbursed in the first five years. Re-flows from projects, which will start in year five of the projects, is in part returned to IFIs, as per the loan agreement, and in part revolved and applied to finance additional climate projects, leveraging further private sector capital.

2.2 Component-by-component analysis

Component 1: Financing

Sub-component 1.1: Financing Direct investments: (total cost: USD 1,190 million; GCF contribution: USD 180 million)

Sub-component 1.2: Financing of municipal and sectoral sub-funds (total cost: USD 300 million; no GCF funding)

15. Eighty per cent of the funding of SGDF will be invested directly in mitigation and adaptation projects across several sub-sectors, in line with the financing guidelines and criteria outlined above, prioritizing projects achieving transformational and best practices. GCF financing will target solely this component.

16. The remaining 20 per cent will be invested in sub-funds for:

- (a) Three key municipalities (Qingdao, Jinan and Yantai, totalling 21.3 million people) designated low-carbon cities, with an accelerated timeline for their emissions to peak (between 2020 and 2025, compared with the provincial goal of 2027, and China's overall goal of 2030); and
- (b) Transformational climate businesses that accelerate innovation in sectors identified as critical to meeting mitigation targets, including construction (e.g. through pre-cast concrete building solutions to increase climate resilience and energy efficiency of buildings), new energy sources (including a hydrogen fuel research and industry hub), or transportation.

Table: Description and size of the SGDF sub-funds

Sub-Funds	Investee Fund Size (Million CNY)	SGDF Investment (Million CNY)	Climate Focus
Jinan Municipal Fund	500	100	Climate investment to support Jinan's early CO ₂ peaking around 2025
Qingdao Municipal Fund	500	100	Climate investment to support Qingdao's early CO ₂ peaking around 2020
Yantai Municipal Fund	500	100	Climate investment to support Yantai's early CO ₂ peaking around 2020
New Energy Fund	3,000	200	Value chain of new energy sector, such as new energy vehicles, low-carbon logistic, fuel switch, distributed solar and wind power, integrated urban renewable energy projects
Green Transport Fund	1,500	300	Rail transit equipment, public transportation such as urban light rails and new energy vehicles
Green Building Fund	2,000	400	Prefabricated green buildings and building energy efficiency
Green Engine Fund	2,000	400	Industrial transformation towards climate friendly industries
Green Technology Fund	2,000	400	High and green technology transfer to Shandong

17. Sub-funds will be managed by separate fund managers but will be based on the same principles and criteria as the core SGDF fund, taking a more programmatic approach in developing key sectors. The chosen sectors reflect considerable ambition and are viewed as having a strong transformational potential beyond the scope of the programme, which in the Secretariat's view justifies the risk profile of the investments. The Secretariat will not contribute funding to the sub-funds.

18. SGDF regulations will ensure that neither the main fund nor the sub-funds will finance projects involving fossil fuels.

Component 2: Project development (total cost: USD 3.5 million; no GCF funding)

Component 3: Knowledge and capacity development (total cost: USD 6.4 million; no GCF funding)

Component 4: Policy development (total cost: USD 0.1 million; no GCF funding)

19. SGDF will feature a USD 10 million technical assistance programme funded by ADB that will cover the cost of:

- (a) A project preparation facility to review and advise on promising projects, improving their climate and social impacts, and helping project sponsors finalize the funding proposals;
- (b) Procuring an independent firm to implement the green rating system and applying it to the assessment of each project and sub-fund against the investment criteria;
- (c) Procuring an independent firm to implement the monitoring and evaluation system, conduct verification of completed projects, and report on post-evaluation through impact studies; and
- (d) Additional knowledge, training and capacity-building needs.

20. The Secretariat views the technical assistance programme as an adequate mechanism to improve quality at entry, guarantee fair and transparent assessments and independent monitoring, minimizing the risks of fund mismanagement. Elements such as the green rating system are innovative and have the potential, if gradually mainstreamed, to contribute to a shift in the climate impact of investments in China.

2.2.1. Implementation arrangements and flow of funds

21. GCF funds, along with those of other international finance institutions, will be provided by ADB to the Government of China through a sovereign loan and on-lent to SDIHG through the Shandong provincial government. SDIHG will then provide the loan proceeds to SGDF via a limited partner agreement defining the setup of the fund and the loan and capital commitments from the limited partners. The loans from IFIs to SGDF will be kept under separate bank accounts and be drawn from at the time of investment. Liquidity will be managed through investment in AAA-rated climate or green bonds, ensuring uncommitted funds at a given moment have a positive environmental impact. Debt service will be paid back by lenders to SGDF, and from SGDF to the IFI, including GCF, as per the respective loan agreements.

22. SGDF will be overseen by the SDIHG board of directors. SDIHG is participated by the Shandong Provincial Development and Reform Commission (40 per cent), State-Owned Assets Supervision and Administration Commission of Shandong Province (30 per cent) and Shandong Provincial Social Security and Pension Funds (30 per cent). SDIHG will be a co-general partner, with the other general partner to be procured through a competitive process.

23. Proposals will undergo peer review by sectoral experts and review by management and the investment committee.

III. Assessment of performance against investment criteria

24. The performance of the programme against the investment criteria will depend on the subprojects that get financed. The assessment below is based on conservative estimates of the portfolio and the investment strategy presented in the funding proposal.

25. As indicated above, the combination of an investment framework that closely matches GCF (favouring impact and transformative potential, with quantitative and qualitative benchmarks, progressive financial incentives for more transformative/best practice projects),

the relevant mitigation and adaptation potential and needs in Shandong, and the size and leveraging capacity of the SGDF, give the proposal a high rating across all investment criteria.

3.1 Impact potential

Scale: High

26. SGDF targets a 75 to 25 per cent distribution of its funding between mitigation and adaptation. Based on these figures, on preliminary project design data from project developers and literature reviews, the programme is expected to reduce greenhouse gas emissions in the energy, buildings transport and land-use sectors by a minimum of 50 million tonnes of carbon dioxide equivalent (tCO₂eq), as a highly conservative estimate, or 2 million t annually for an average project lifespan of 25 years.

27. In terms of adaptation, the effects of climate change are already experienced in the form of impacts from extreme weather-related events. In the 2010–2015 period, floods and storms, droughts and snow resulted in 83.69 million affected people and 524,000 damaged houses, with a direct economic loss of nearly USD 8 billion; an average 1 to 3 per cent of gross domestic product has been lost since 2000 as a result of weather-related extreme events. Climate models predict higher temperatures (0.5–1.3 °C by 2020, and 1.5–2.7 °C by 2050), rainfall (by ~4 per cent in 2020, and 9–12 per cent in 2050), and more frequent extreme rainfall events. An estimated 10 million to 14 million people could benefit from reduced impacts of climate change, particularly heat islands in cities, floods, droughts and impacts on the province’s 3,000-kilometre coastline.

3.2 Paradigm shift potential

Scale: High

28. The programme aims to achieve a major shift in the way that public and private finance is allocated, making climate projects a bankable investment for private, commercial and institutional investors, and therefore contributing to achieving the mitigation and adaptation targets defined by the province. The financial structure of SGDF and its investment framework (aimed at providing a relatively small level of public concessional finance to make investments viable, while crowding in, rather than out, private finance) is a departure from traditional models of public investment in mitigation and adaptation, increasing the leverage and climate effectiveness of limited public funding. The crowd-in of private sector financing is made possible fundamentally by reducing early stage risks and overall cost of finance.

29. The proposed sub-funds that will be part of SGDF, which are not funded by GCF, address specific sectors with a high paradigm shift potential, proposing innovative solutions. While inherently risky, they represent a major effort to develop industry hubs in sectors (such as energy technology or transport) where a strong policy push and a critical mass of investment is needed to generate the enabling environment for investments to happen. Combined with the participation of high-tech firms with links to China’s top environmental engineering schools (Tsinghua University), these programmes have a strong upside, with the chance to generate innovations with global impact.

30. Another innovative element of the programme is the adoption of green ratings that will provide an alternative to the usual financial ratings under which projects are traditionally appraised. The ratings will be carried out by an international rating agency to be procured. While barriers to the adoption of green ratings beyond the scope of the programme are expected, the piloting of green ratings may help generate valuable information that facilitates their gradual development and adoption in other regions. Relatedly, the introduction of international green standards in the Chinese context can also help move the growing Chinese green bond market towards stricter standards, enhancing their climate impact, as it can help pave the way to leveraging private sector investment nationwide.

31. Lessons learned in Shandong have a strong potential to be replicated both in China (where the active involvement of the Provincial Development and Reform Commission is indicative of high-level interest at the national level in the results of the programme) and in the wider region. ADB is strategically working on the replication of the programme through the region, including in Indonesia and other countries that are part of the Association of Southeast Asian Nations, with the potential to unlock large amounts of private investment in climate change in Asia.

3.3 Sustainable development potential

Scale: High

32. In the context of Shandong (with high levels of air, water and soil pollution driven by large-scale use of coal, motorized transport and industrial development) the proposed investments in the areas of energy generation, distribution and efficiency, or transportation have a strong potential to yield relevant environmental co-benefits. Expected co-benefits include the displacement of around 19 million t of coal, resulting in the reduction of 162,213 t of nitrogen oxide and 141,221 t of sulphur oxide. Co-benefits will be explicitly considered when rating proposals, thus rewarding proposals (such as those related to water and waste management) that use the most environmentally and socially friendly alternatives. Biodiversity benefits, albeit not quantified, are also expected from investments in re-forestation in coastal areas.

33. The most-relevant social benefits, in addition to increased resilience to climate change, will likely be felt in terms of health, particularly of most vulnerable communities, ensuing from improved water, air and soil quality.

3.4 Needs of the recipient

Scale: Medium-High

34. Shandong is a coastal province with a low availability of water resources and that is vulnerable to the impacts of droughts, floods and other climate-related impacts. Annual losses from such impacts have exceeded USD 1.5 billion annually over the last five years and are expected to increase in the future.

35. Proposed activities will be encouraged to support specific beneficiary groups identified as particularly vulnerable in national climate or development strategies. Advice in the proposal development stage, funded through Component 2, will support this objective. Each project assessed using the process set out in annex 9 of the funding proposal will be benchmarked against the priority adaptation investment needs of the province as determined by the climate assessment in section C1 and detailed in annex 14.2.

36. The programme's design addresses the province's lack of large-scale public finance, the most substantive need of the province to achieve a large-scale transformation of its economy, through the establishment of a high-profile, country-driven platform that allows the blending of public finance with concessional finance from international finance institutions and that of private sector finance on commercial terms.

3.5 Country ownership

Scale: High

37. The programme's approach to mainstreaming finance for low-carbon local development is aligned with the country's national climate strategy and priorities, specifically the objectives under the nationally appropriate mitigation actions (NAMA) of China. Coherence with the relevant climate and sectoral policies will be part of the selection criteria of each of the subprojects.

38. The programme has government support at the highest level from the province's strategic economic development body, Shandong's Provincial Development and Reform Commission, which holds the largest stake in SDIHG. This is viewed as a positive sign for the platform to obtain the political backing and visibility necessary to succeed in its goal of harness private sector investment. This mitigates the risk of non-materialization of private sector financing. The provincial government has also committed to financing any shortfall in private investor funding at the facility level.

39. The executing entity for the programme, Shandong provincial government, has a clear mandate from the Government of China to meet the Government's 5-year plan targets, which include green and low-carbon economic development, poverty eradication and support to emerging industries. The implementing agency, SDIHG, is identified by ADB as having a good track record in implementing projects with the public and private record, including other funds. SDIHG has 17 subsidiaries and an equity of close to USD 2 billion. The Secretariat understands that the strong capacity and clear mandate of these agencies should facilitate the implementation and provide the necessary drive for the project to succeed.

3.6 Efficiency and effectiveness

Scale: High

40. The Secretariat finds the programme to make efficient and effective use of GCF funding. At the subproject level, SGDF will not finance projects that are already bankable, financing instead those that have a viability gap. Projects with better performance against the investment framework will be eligible for more favourable tenors and interest from the SGDF, as detailed on page 7 of the funding proposal. Cost-efficiency indicators will be based on McKinsey mitigation data for different sectors in China, although it is recommended that they be recalibrated based on the reality on the ground.

41. GCF funding will represent only 12 per cent of the SGDF capitalization, with the remaining 88 per cent coming from other IFIs (ADB, AFD and KfW with over 20 per cent of the total¹), Shandong's provincial government and the private sector. The co-financing ratio is thus 7.3:1. Further, SGDF is expected to leverage five times its funding (USD 7.5 billion) over the 20-year lifespan, including revolving and reinvested funds. In total, GCF would help unlock an amount of investment over 40 times the size of the GCF funding, acting as a catalyser for transformative investments.

42. As a result of this leveraging effect and the strong mitigation potential in the province, and considering a conservative mitigation potential estimate of 50 million tCO₂e, the cost per t for the GCF would amount to USD 3.3 USD/tCO₂e, or USD 33/tCO₂e for SGDF as a whole. This figure makes it one of the most cost-efficient GCF funding proposals to date.

43. GCF funding will be provided in the form of sovereign loans according with the Board-approved financial terms and conditions for low concessionality public sector projects (0.75 per cent interest, 20 years) *pari passu* with the funding from other financing institutions (15 and 20 years, based on London Interbank Offered Rate or European Interbank Offered Rate).

44. Review of the financial model indicates that the level of concessionality at SGDF level is adequate to induce investment, as the SGDF produces an average financial internal rate of return at the project level of 6.7 per cent, including 3.6 per cent for public sector investors and 9.1 per cent for private sector investors.

IV. Assessment of consistency with GCF safeguards and policies

¹ Final figures to be confirmed.

4.1 Environmental and social safeguards

45. The programme, SGDF, seeks to leverage private, institutional and commercial finance to undertake climate mitigation and adaptation projects in Shandong province, China. Identified priority sectors of intervention include renewable energy, energy efficiency, urban transport, water and sanitation, and waste management, among others. The accredited entity (AE) has classified the programme as financial intermediation that will include high-risk projects for involuntary resettlement and moderate risk projects for environmental impacts. Given that infrastructure projects and projects with significant involuntary resettlement impacts may be included in the programme, the GCF Secretariat has categorized the programme as high-level intermediation or I-1. The environmental and social management system (ESMS) excludes projects that are assessed to be category A for environment and category A and B for indigenous peoples from funding by SGDF. Projects with potential risks and impacts rated up to category A for involuntary resettlement may be supported by SGDF.

46. The AE submitted an environmental and social management system (ESMS) for the programme as the environmental and social safeguards (ESS) document. The ESMS describes the implementation arrangements and responsibilities between the AE and the co-executing entity, SDIHG, as the management company of SGDF as well as the project sponsors for the environmental and social due diligence for projects. The ESMS includes a gap analysis of the environmental and social safeguard requirements of the AE and the national policies on involuntary resettlement, including measures that will be taken to address any gaps in order to comply with the standards of the AE. Furthermore, the ESMS details how the safeguards requirements of the AE will be applied at the project level from screening, assessment, and preparation of safeguards documents for different environmental and social risk categories and appraisal up to the review of reports on the implementation of ESS and monitoring for effectiveness. In addition, templates that will support environmental and social due diligence processes have been annexed to the ESMS, such as environmental and social screening checklists, outlines of an environmental assessment report, resettlement plans, and an ESMS implementation report, among others.

47. The project specific assessments, such as the initial environmental examinations and environmental evaluation report, include discussions on the policy, legal and administrative frameworks in the outlines. However, it will also be necessary for these documents to include gap assessments of the national regulations and the AE safeguards policy as well as any gap-filling measures that will be undertaken where discrepancies exist between the two. For example, a comparison of the AE standards for health, safety and labour and the national regulations can be added to the project-level assessment, including measures that will be taken to address any inconsistencies. The assessment by the GCF Secretariat recommends the update of the ESMS to include descriptions of the salient environmental and social risks of the programme, given the likely types of investments to be supported, the environmental and social context of Shandong as well as the environmental and social safeguard capacity of the executing entities.

48. The overall environmental and social risk level of the programme is high risk, which warrants disclosure of the ESMS document. Both the English and Chinese versions of the ESMS document have been disclosed by the AE on its website. At the project level, the AE commits to ensuring that SDIHG submits the following items for disclosure on its website: ESS documents for high and moderate risk projects; annual environmental and social monitoring reports; and annual ESMS implementation reports. Project information should also be disclosed to the public on SDIHG and SGDF websites or local government offices in the project area.

49. The programme has not yet identified projects that will be implemented in the priority sectors of intervention. Consequently, a detailed assessment of potential environmental and

social impacts has not been undertaken, and mitigation measures for potential negative impacts are not provided.

50. Environmental: projects categorized as high environmental risk according to the ESMS of the AE are excluded from financing under the programme by SGDF. Exclusions related to environmental impacts include avoiding areas of critical habitats and cultural heritage resources as well as including areas that support cultural heritage resources or where cultural heritage resources may be found. Projects classified as moderate environmental risk projects, equivalent to Category B, will be required to undertake an initial environmental examination and/or an environment audit if there are existing facilities, and a corrective action plan (CAP) and/or an environmental management plan (EMP), including appropriate mitigation measures, environmental monitoring and reporting. The outline of the initial environmental examination appended to the ESMS is consistent with the content of an environmental assessment report. In the update of the ESMS, it will be necessary for the AE to provide clarity on the outline of the Environmental Evaluation Report annexed in the ESMS and its use in relation to the requirements of the ESMS.

51. Social: projects that involve significant involuntary resettlement impacts will be included in the programme by SGDF. Elements of a resettlement policy framework and/or livelihoods restoration framework for potential temporary or permanent impacts associated with physical and/or economic displacement are included in the ESMS. Projects for which involuntary resettlement is identified as a potential impact following screening should determine the scope of the resettlement planning required for persons to be displaced, both physically and economically, and prepare resettlement plans that include entitlements for displaced persons and income and livelihood restoration strategies.

52. The programme will not finance projects involving indigenous peoples or ethnic minorities.

53. SDIHG has the responsibility to ensure that tasks are undertaken regarding implementation of the ESMS. In addition, the capacity to fulfil this responsibility may be drawn from the programme's technical assistance resources as well as from a pool of qualified environmental and social consultants. On capacity-building, the ESMS includes training for SDIHG and project companies on topics such as the standards of the AE and national regulations, implementation of environmental management plans, and the grievance redress mechanism. The GCF Secretariat recommends that in the update of the ESMS, the safeguards implementation roles of SGDF and SDIHG be described more clearly and in greater detail. Further the assessment of the institutional capacity of the executing entities, if undertaken, should be presented in the ESMS to form the basis of the proposed institutional capacity-building plan.

54. Plans for managing the environmental and social impacts for projects will be implemented and monitored for effectiveness. Environmental and social monitoring progress reports will be reviewed by the SGDF Safeguard Specialist. ESMS implementation reports will be prepared by SDIHG and reviewed by the AE. In the update of the ESMS, it will be useful for the AE to provide a clearer budget for establishing and implementing the ESMS at the programme-level that also includes due diligence, activity-specific management plans, and the monitoring and reporting of ESMS implementation.

55. The ESMS includes the elements of stakeholder engagement required for projects, however, the AE will need to elaborate further, through a stakeholder engagement framework, how the programme intends to engage and promote the participation and involvement of stakeholders and the minimum expectations at the project level. Description of stakeholder engagement will have to be provided in greater detail in the update of the ESMS. Meaningful consultations with affected people will need to be undertaken to facilitate their participation. This includes ensuring women's participation in the consultation processes as well as early in

the project preparation process, and ensuring that their views and concerns are made known to, understood by, and taken into consideration by decision-makers. Stakeholders will need to include affected people and concerned non-government organizations, among others. Consultations with stakeholders are expected to continue throughout project implementation as necessary to address issues related to environmental and social impacts.

56. A programme-level grievance redress mechanism is provided in the ESMS for receiving, recording and resolving concerns raised with respect to the project. A member of staff designated to oversee the implementation of the ESMS within SDIHG will be the main focal person of the mechanism and will ensure its effective implementation, including disclosing information about projects. The ESMS describes the responsibilities of SDIHG, local authorities and the complainants, and timelines for the resolution of issues raised at each stage of the mechanism. The GCF Secretariat recommends that the update of the ESMS include a process for resolving grievances at the programme-level and a process for disseminating information on the mechanism to stakeholders at the project level.

4.2 Gender policy

57. The AE has submitted a gender framework and an initial poverty and social analysis together with the proposal, so it complies with the operational guidelines of the GCF Gender Policy and Action Plan. The gender framework has collected information on gender issues at the national level, including on: poverty; economic development; the policy framework for promoting gender equality and participation in the labour force; and access to education and political participation at the provincial level. The gender framework also identifies some opportunities presented by the project where women can benefit, for example, through new employment opportunities during the construction and operation of projects. The AE has outlined requirements for projects that will be financed under the programme, that is, social analyses with gender considerations and project-level gender action plans that include specific gender design features, targets and performance indicators in the design and monitoring frameworks for the collection of sex-disaggregated data. It is recommended that the AE ensure that these requirements are addressed by using tools such as gender checklists and toolkits for various sectors, some of which have been included in the priority sectors of intervention by the programme.

58. The AE has submitted a programme-level gender action plan consisting of actions, indicators with targets, timelines and responsible agencies to assist in gender mainstreaming at the project level. The programme level gender action plan includes actions on the participation of men and women in public consultations on projects and promoting employment and income generation opportunities for women, which can be distilled at the project level by responsible agencies. The gender expertise of the AE will contribute to reviewing the implementation of the gender-related aspects of the programme. Targets for expected beneficiaries of the programme are sex-disaggregated and have been incorporated into the logic framework of the funding proposal for fund-level impacts.

59. It is recommended that the AE ensure that financial resources are set aside at the project level to ensure implementation of gender action plans. Further gender analyses at the project level that will be undertaken should assist in identifying actions that will be implemented to contribute to achieving gender results for the programme. Rationalization of targets in project level gender action plans should be supported by baseline data, which should be collected at the time of undertaking gender analyses for the projects or before commencing the implementation of the projects.

4.3 Risks

4.3.1. Overall proposal assessment (risk):

60. GCF is requested to provide a sovereign loan of USD 180 million, to be used to investment into the equity of SGDF. The funding from GCF along with the funding from ADB, KfW and AFD will be used by the Ministry of Finance for on-lending to SDIHG. Through the Shandong provincial government, the SDIHG will use the funds for its equity investment as a limited partner into SGDF. The SGDF asset allocation is expected to be 80 per cent into direct investments and 20 per cent into sub-funds; and

61. The proposal has potential to crowd in other investors including private sector investors at SGDF level and also at sub-investment level. The success of the programme depends on the ability of SGDF to source appropriate investments while adhering to the climate focus. Hence, the role of the fund manager of SGDF is crucial.

4.3.2. Accredited entity/executing entity capability to execute the current programme (low risk):

62. ADB, the AE, has a long history of experience of policy advisory and financing investments in China. ADB has worked with the Government and private sector in the country; and

63. SDIHG, a government-owned entity, is co-executing entity (EE) for the programme. SDIHG has a track record of successfully implementing public and private projects including multiple funds in Shandong. As per the information shared by the AE, the SDIHG has a sound financial position and employee set up. SDIHG will also support the programme by being a joint venture (JV) partner as the fund management company for the SGDF.

4.3.3. Programme-specific risks (medium risk):

64. Fund Manager: the role of the fund manager is crucial to source the appropriate investments while adhering to climate rationale. The AE has stated that the fund manager is a joint venture (JV) between SDIHG and a top-tier asset manager to be selected on a competitive basis, which will hold a licence issued by the Asset Management Association of China. Though the other JV partner is yet to be selected, SDIHG being a JV partner is expected to have a positive impact. As a JV partner of SGDF fund manager, SDIHG is also relied upon to ensure that the sub-funds adhere to the climate focus. The AE has also stated that the final-term sheet and limited partners agreement of SGDF are subject to the AE having no objection;

65. Foreign currency fluctuations: the financing by GCF, ADB and other IFIs will be in USD/Euro. However, the investment to be made by SGDF is expected to be in local currency and/or into companies with revenue in local currency. SGDF, and partly the investee companies, therefore, will be exposed to currency fluctuation risk. However, this is expected to be partly mitigated by the lower interest rate vis-à-vis local currency funding; and

66. Co-financing structure and crowding in: as per the funding proposal, the USD 180 million investment by GCF is expected to lead to USD 1.5 billion of total investment. To ensure that the desired level of leverage is achieved, it is necessary that GCF funds and co-financing are disbursed proportionately. The AE has clarified that loans from all the IFIs are disbursed over five years and are proportionately allocated. It is recommended that investment into SGDF by SDIHG and other public sector investors is done proportionately with the investment by the private sector investors who are expected to contribute 43 per cent of the capital of SGDF.

4.3.4. Project viability and concessionality

67. GCF concessional resources will be used by SDIHG for making equity investment as limited partner of a fund. The fund will in return make ~20 per cent of its asset allocation as

investment into sub-funds. It is necessary to have an optimum cost structure (management fees) for SGDF and the sub-funds to ensure that the concessionality of GCF resources reaches the end beneficiaries. The AE has stated that SGDF management fee structure will be determined through competitive bidding. The AE is also requested to ensure that the sub-funds have optimum cost structure;

68. At the SGDF level, the average financial internal rate of return is about 6.7 per cent; the financial internal rate of return of public sector investors is estimated at 3.6 per cent and that of private sector investors is estimated at 9.1 per cent. Thus, the GCF concessional resources enable crowding-in from private sector investors at moderate returns; and

69. The AE has also provided an estimate of return on equity (ROE) for the sponsors of the project funded by SGDF. The ROE is estimated to be 10–20 per cent with average ROE of 12 per cent. Therefore, GCF concessional resources are expected to be used by SGDF for enabling project viability and not for maximizing the equity returns to the sponsors.

4.3.5. Compliance risk

70. A preliminary sanctions screening does not show any hits that would raise issues as the present with respect to the parties identified;

71. SDIHG, which is a financial intermediary on the programme, underwent a due diligence review by ADB. At present, no red flags have been identified. Nevertheless, compliance suggests that the AE monitor any changes that may affect the stakeholders in a way that changes their risk.

72. For the governance of the project, financial management, procurement, integrity due diligence, anticorruption, policy and legal, other institutional mechanisms and on-lending mechanisms will be implemented through the capacity development of SGDF;

73. Compliance would like a little more detail about how these capacities will be developed (i.e. training, mentorship, partnering, etc.);

74. Any relevant Chinese financial institutions could potentially become partners with SGDF after proper integrity due diligence is conducted and documented adherence to the international climate standards;

75. Section G on risk assessment didn't highlight money-laundering/terrorism financing risk as relevant to the project. However, given the volatility of trade and other financial relationships affecting the subject jurisdictions, compliance would suggest this be an ongoing effort of the parties to monitor for money-laundering/terrorism financing risks and to implement appropriate action when warranted;

76. Compliance recognizes that ADB has long-standing experience in anti-money-laundering/combating the financing of terrorism issues. However, due to the volatility of some of the financial issues, directly or indirectly, there remains a threat that should be carefully monitored. Compliance would rate this as a medium risk project, with the possibility that parts of it could be high risk.

4.3.6. The GCF portfolio concentration risk (low risk):

77. In case of approval, the impact of this proposal on the GCF portfolio concentration in terms of the result area and single proposal is not material.

4.3.7. Recommendation:

78. It is recommended that the Board consider the above factors in its decision.

Summary risk assessment		Rationale
Overall programme	Medium	GCF is requested to provide a sovereign loan. The funds from GCF and other international financial investors will be used by the executing entity to finance its equity investment into SGDF as limited partner. The role fund manager is crucial to source the appropriate investments while adhering to climate rationale. SDIHG, the executing entity will be a joint venture partner in the fund manager thus impacting the decisions at the SGDF level.
Accredited entity/executing entity capability to implement this programme	Low	
Project specific execution	Medium	
GCF portfolio concentration	Low	
Compliance	Medium	

4.4 Fiduciary

79. The co-Executing Entity for the Programme is the Shandong Development Investment Holdings Group (SDIHG), which is a wholly state-owned enterprise. SDIHG will comply by the ADB Guidelines through a Project Agreement signed in parallel to the Loan Agreement with ADB. ADB will enforce compliance of the Loan and Project Agreements during bi-annual review missions during the first 5 years; annual review mission from year 6 to year 10 and as required from year 10 to 15.

80. The financial management assessment of SDIHG was conducted following ADB's Financial Management and Analysis of Projects. Results of the assessment shows that SDIHG has financial management systems in place and that financial management procedures are well implemented to facilitate proper financial management and reporting. The overall financial management environment of accounting, reporting and monitoring systems are sufficient to support implementation of multiple loan facilities from IFIs.

81. All procurement activities financed from GCF and ADB loan, will be carried out in accordance with ADB's procurement policy and regulations for Financial Intermediary. Disbursement under the programme will follow ADB's Loan Disbursement Handbook.

82. The Fund Management Company (FMC) is being set up to manage the fund. The FMC will prepare the annual consolidated Statement of Utilization of Funds (SUF) to be audited annually in accordance with international standards on auditing and with the Government's audit regulations, or with auditing standards acceptable to ADB. The audit will be conducted by an independent auditor whose qualifications, experience, and terms of reference fulfil ADB's rules and regulations.

4.5 Results monitoring and reporting

83. As a cross-cutting project, the intervention has a direct greenhouse gas reduction potential estimated at 50 million tCO₂e over the programme lifetime of 20 years. The expected total number of direct and indirect beneficiaries is expected to be 10 million and 50 million, respectively, and is reflected as per the gender-disaggregated metrics of the relevant GCF impact and outcome indicators.

84. Overall, while the funding proposal is clear regarding the planned components and activities, an1d has a clear rationale and strategies for implementation, the AE will need to align the information under section C.3 (programme description) and C.8 (timetable of implementation) and ensure consistency with the activities section of information in the logic framework.

85. Regarding section H.1, based on Secretariat comments, the logic framework with GCF Fund Indicators and Programme Indicators continues to require additional improvements prior to funded activity agreement execution. The Secretariat clears the logic framework, based on the understanding that this clearance is subject to the agreement of the AE to resolve the above identified concerns to the satisfaction of the GCF Office of Portfolio Management as part of, or prior to, funded activity agreement negotiations.

86. Under section H.2, complies with GCF reporting standard, but shall be revised to include the methodologies on mid- and end-of-project evaluations.

4.6 Legal assessment

87. The Accreditation Master Agreement (AMA) was signed with the Accredited Entity on 17 August 2017, and it became effective on 6 September 2017.

88. The Accredited Entity has not provided a legal opinion/certificate confirming that it has obtained all internal approvals and it has the capacity and authority to implement the proposed programme. Pursuant to clause 4.20 of the AMA, the Accredited Entity shall provide a certificate confirming that all final internal approvals have been obtained and that it has the capacity and authority to administer the GCF Proceeds and Other GCF Funds (each as defined in the AMA) and comply with its obligations under the AMA with respect to the proposed programme, within the number of days approved by the Board, provided that such period shall not be less than 120 days. Section A.3 of the funding proposal mentions that the Accredited Entity expects to obtain its internal approvals in the first quarter of 2019.

89. The proposed project will be implemented in the People's Republic of China (PRC), country in which GCF is not provided with privileged and immunities. This means that, amongst other things, GCF is not protected against litigation or expropriation in this country, which risks need to be further assessed. The Secretariat sent to the Government of PRC a draft bilateral agreement on privileges and immunities in March 2016, together with a background note, in March 2016. However, no response has been received so far.

90. The Heads of the Independent Redress Mechanism (IRM) and Independent Integrity Unit (IIU) have both expressed that it would not be legally feasible to undertake their redress activities and/or investigations, as appropriate, in countries where the GCF is not provided with relevant privileges and immunities. Therefore, it is recommended that disbursements by the GCF are made only after the GCF has obtained satisfactory protection against litigation and expropriation in the country, or has been provided with appropriate privileges and immunities.

91. Under the proposed programme, as described in the funding proposal and term sheet, the Accredited Entity will enter into a subsidiary agreement, in the form of a sovereign loan agreement, with the PRC, which will channel the GCF Proceeds, under an on-lending agreement, to the Shandong Province Government (SPG), which in turn will pass down such funds, under an on-lending agreement, to the Shandong Development and Investment Holding Group (SDIHG). SDIHG, acting as a limited partner, will invest the GCF Proceeds into the Shandong Green Development Fund (SGDF) and will also hold a fifty-one per cent (51%) interest in the general partner of SGDF. The SGDF will use the GCF Proceeds to finance eligible sub-projects in accordance with the programme management plan (PAM) to be developed and approved by the Accredited Entity and SPG.

92. The definition of the term "Executing Entities" in the AMA includes any entity that channels GCF Proceeds and/or carries out the implementation of a funded activity. Pursuant to this definition, each of the PRC, SPG, SDIHG and SGDF is an Executing Entity. The Accredited Entity will enter into Subsidiary Agreements with PRC in the form of a sovereign loan agreement, and with the SPG and SDIHG in the form of a tripartite project agreement (Project Agreement); however the Accredited Entity will not have a direct contractual relationship with

the SGDF which would allow the Accredited Entity to directly require and enforce the relevant AMA and FAA provisions to the SGDF in its role as an Executing Entity.

93. Notwithstanding the foregoing, the Subsidiary Agreements to be put in place by the Accredited Entity with the PRC, SPG and SDIHG will contain the relevant provisions requiring SGDF to comply with all FAA and AMA obligations, including those relating to passing down concessionality, sub-project selection criteria and methodologies, and SDIHG will be required to monitor SGDF's compliance with such requirements. In addition, SDIHG, through its interest in the general partner, will ensure that SGDF complies with the relevant provisions under the Project Agreement, including the PAM, and that SGDF also require such compliance by the relevant investee companies.

94. In order to mitigate risk, it is recommended that any approval by the Board is made subject to the following conditions:

- (a) Delivery by the Accredited Entity to the Fund of a certificate or legal opinion within 120 days of the Board approval confirming that it has obtained all its internal approvals;
- (b) Signature of the funded activity agreement in a form and substance satisfactory to the Secretariat within 180 days from the date of Board approval, or the date in which the Accredited Entity has provided a certificate or legal opinion confirming that it has obtained all internal approvals, whichever is later; and
- (c) Completion of legal due diligence to the satisfaction of the Secretariat.

Independent Technical Advisory Panel's assessment of FP082

Proposal name:	Catalyzing Climate Finance (Shandong Green Development Fund)
Accredited entity:	Asian Development Bank (ADB)
Project/programme size:	Large

I. Assessment of the independent Technical Advisory Panel

1.1 Impact potential

Scale: Medium/High

1. China is currently the world's second largest economy, following the United States of America, and has a population of 1.3 billion. It is also the largest developing country and carbon emitter (2016), releasing just under a third of global emissions in 2016. Nearly three-quarters (73 per cent) of the growth in global carbon emissions between 2010 and 2012 occurred in China. China is also ranked as the twelfth most affected country by extreme weather events with financial losses amounting to USD 82 billion in 2016.
2. Under the thirteenth Five-Year Plan (2016-2020), the Government of China promotes a shift from development that is oriented towards increasing gross domestic product (GDP) to a development model centred on quality of growth. It has launched several strategic initiatives on climate change that build the foundations for strong supporting policies and regulatory frameworks. The central government has determined regional low-carbon development as an important way to control greenhouse gas (GHG) emissions. Accordingly, all provinces incorporate the carbon-intensity reduction goal into their economic and social development plans and annual plans.
3. Shandong is a coastal province of China and part of the East China region. It is ranked eighth in terms of provincial GDP per capita and has a large population of 99.47 million (2016). Shandong has the third largest provincial economy and therefore plays a critical role in overall national GDP. However, the Shandong tops the country's energy consumption and number of vehicles, and it is responsible for the large portion of the GHG emissions in the country. Climate vulnerability is recognized as a limiting factor for growth at the core of the water–food–energy nexus in Shandong.
4. Shandong is now required by the government to reduce its carbon dioxide (CO₂) emission intensity by 20.5 per cent by 2020. This is the largest reduction to be set at the provincial level in China. To achieve this target, Shandong requires significant investments in mitigation from energy, urban activities and industrial transformation and adaptation from water resources, agriculture, and coastal and ecologically vulnerable areas. Shandong aims to peak its CO₂ emissions around 2027, three years earlier than the national goal under the intended nationally determined contribution.
5. The programme, proposed by the accredited entity (AE), the Asian Development Bank (ADB), aims to mobilize USD 1.5 billion for the Shandong Green Development Fund (SGDF) to catalyse climate finance for a portfolio of climate subprojects in Shandong (Component 1). It is proposed to mobilize the funding from international financial institutions (IFIs) against sovereign guarantee (USD 484 million: 32 per cent; Shandong provincial and local governments (USD 375 million: 25 per cent); private, institutional, and commercial (PIC) investors (USD 626

million: 42 per cent); and the SGDF Fund Management Company (USD 15 million: 1 per cent). The IFIs include GCF (USD 180 million), the AE (USD 100 million), Kreditanstalt für Wiederaufbau (EUR 100 million), and Agence Française de Development (EUR 75 million). The PIC funds will be mobilized and invested in SGDF and subprojects over multiple closings during the 20-year duration of SGDF.

6. SGDF will be managed by the SGDF Fund Management Company, a fund manager, to be created and invested equally by the Shandong Development Investment Holdings Group (SDIHG), a state-owned enterprise wholly owned by the Shandong Provincial Government, and a private sector entity to be selected. SGDF will finance a portion of the total capital expenditures of selected climate mitigation and adaptation subprojects in the form of equity and/or debt.

7. In addition, USD 10 million for technical assistance (TA), funded by the AE, is proposed (Components 2, 3 and 4): TA for design and financial structuring support (Component 2: USD 3.5 million); TA for training, green rating and a monitoring and evaluation system (Component 3: USD 6.4 million); and TA for policy seminars (Component 4: USD 0.1 million). The AE will seek additional donor funds to enhance the TA programme in 2019.

8. The asset allocation of SGDF under Component 1 will consist of direct investment in climate resilient infrastructure subprojects; green and high technology manufacturing businesses (80 per cent); and climate sub-funds for specific municipalities or sectors (20 per cent). The climate sub-funds will include municipal funds and sectoral funds. With respect to distribution between mitigation and adaptation, it is estimated to be of the ratio of 75:25.

9. The AE estimates that expected mitigation benefits after the fifth year of SGDF operation will deliver GHG emission reductions of 2 million tonnes of carbon dioxide equivalent (tCO₂eq) annually, and 50 million to 75 million tCO₂eq over the 20-year tenor of SGDF. The estimation the AE has prepared is based on 10 subprojects that SGDF is currently considering, including three subprojects with preliminary feasibility studies and another three subprojects with basic CO₂ reduction data.

10. The AE further estimates that adaptation benefits include 10 million direct beneficiaries, or 10 per cent of Shandong's population. The number of indirect beneficiaries is estimated at 25 million, of which 50 per cent are women.

11. The mitigation impact estimations prepared by the AE are based on sample subprojects being considered by SGDF. However, the adaptation impact estimations are prepared based on the number of people at risk from adverse effects in Shandong. No candidate subprojects to be based on the adaptation impact estimations have been identified. The impacts are to be realized during the 20-year tenor of SGDF so uncertainty remains.

12. Accordingly, the independent Technical Advisory Panel (iTAP) views impact potential of the proposed programme as "Medium/High".

1.2 Paradigm shift potential

Scale: Medium

1.2.1. Potential for scaling up

13. The Chinese Academy for Environmental Planning estimates environmental investment at around 17 billion Chinese yuan (CNY) (USD 2.7 billion) under the thirteenth Five-Year Plan (2015–2020). Given the very large investment required, new mechanisms are being sought to mobilize financing especially from the PIC sector for climate investments.

14. In Shandong, PIC financing is generally available in the form of debt-for-infrastructure projects developed through public-private partnerships (PPP). Climate change projects or climate change aspects of infrastructure projects are not regarded as priority or essential by PIC

investors in their investments. Traditional government finance and bank commercial funding do not cater for the needs of climate change projects with longer maturity, flexible terms and competitive interest rates.

15. The proposed programme aims to establish a mechanism to mobilize and channel funding from PIC investors to promote climate change mitigation and adaptation interventions that would otherwise rely on long-term government funding or would not proceed due to a shortage of public funding or perceived high risk. The SGDF is expected to be a model that can be replicated beyond Shandong, in other priority provinces and then at the national level.

16. However, the funding proposal does not include a study of the financial market identifying and assessing the bottlenecks and constraints that prevent PIC investors from financing climate mitigation or adaptation projects in Shandong.

1.2.2. Contribution to the regulatory framework and policies

17. The SGDF will be managed by SDIHG, the investment vehicle of the Shandong Provincial Government. The SDIHG Board includes a representative from the Development and Reform Commission of Shandong Province. Findings and lessons learned from SGDF investments in climate change projects can be directly transmitted by the representative to the provincial government policy-making process, and disseminated to other provinces in China.

1.2.3. Potential for knowledge and learning

18. The TA provided by the AE includes a project preparation facility (Component 2). This provides support to project sponsors to upgrade their project design using advanced and appropriate technologies and processes that can further enhance the project's climate impacts and fulfil GCF climate investment criteria.

19. The Project Preparation Facility will be used on a reimbursable basis. Since the cost will be recovered subsequently as part of a subproject loan, the facility can be sustainable over the long term.

20. The TA includes Component 4, which focuses on support to capacity-development through the dissemination of knowledge and experience gained through SGDF investments.

21. The AE intends to promote a similar concept to SGDF in other developing member countries in Asia and the Pacific through its Green Finance Catalyzing Facility, following the implementation of SGDF. Dissemination of the lessons learned from the proposed programme design and implementation is secured through the knowledge action plan of the AE and the co-financiers.

22. The proposed programme has potential for scaling up and contributing to the regulatory framework and policies not only at provincial level but also at the national level in China. Findings and lessons learned generated through the SGDF operation will be disseminated by the AE in its work in the region. Accordingly, the iTAP considers the paradigm shift potential of the proposed programme as "Medium/High".

1.3 Sustainable development potential

Scale: Medium/High

1.3.1. Environmental co-benefits

23. Environmental co-benefits include improved quality of air, water and soil as well as improved biodiversity. The AE estimates that the GHG reduction of 50 million tCO₂eq will displace around 19 million t of coal, resulting in the reduction of 162,213 t of nitrogen oxide and 141,221 t of sulphur oxide.

1.3.2. Social co-benefits

24. It is expected that the programme will directly benefit about 10 million people in Shandong and indirectly benefit about 25 million from neighbouring provinces.

1.3.3. Economic co-benefits

25. The programme will directly create new employment opportunities and improve local economic development in Shandong.

1.3.4. Gender-sensitive development impact

26. The gender policy of the AE promotes more effective projects to support the proactive involvement of women in project planning and implementation and to ensure gender mainstreaming. The proposed programme includes technical assistance that will finance knowledge products, workshops, community outreach and specific education programmes.

27. Investments under the programme contribute to several Sustainable Development Goals (SDGs):

- (a) SDG 9 “Industry, Innovation and Infrastructure” building climate resilient infrastructure and fostering innovative climate finance models;
- (b) SDG 11 “Sustainable Cities and Communities” making cities and communities more resilient, safe, inclusive and sustainable; and
- (c) SDG 13 “Climate Action” taking urgent action to promote climate related investments to combat the impacts of climate change. In particular, the programme fosters a strategy of low-carbon infrastructure and industrial development, addressing the challenges posed by rapid urbanization, and scaling up action to meet the more ambitious goals of ecological civilization.

28. The iTAP considers the sustainable development potential of the proposed programme as “Medium/High”.

1.4 Needs of the recipient

Scale: Medium/High

1.4.1. Vulnerability of the country

29. China is ranked as the twelfth country most affected by extreme weather events, with financial losses amounting to USD 82 billion in 2016.

30. The “Implementation Plan for Shandong Province for Addressing Climate Change” (2009) identified key climate change impacts observed in Shandong, such as an increase in temperature and precipitation.

1.4.2. Absence of alternative sources of funding

31. The proposed programme aims to develop a new financing mechanism effective for climate finance by mobilizing funding from the PIC sector in China. SGDF will act as a catalyst for local climate finance in capital markets. It provides new instruments and new funding sources for climate finance.

32. The AE believes that GCF participation in SGDF is essential to mobilize a large amount of financing from the PIC sector as it is regarded as providing international recognition of SGDF objectives and operations in climate change mitigation and adaptation in Shandong, and more broadly in China.

33. The proposed GCF assistance of USD 180 million will be in the form of a concessional loan for a tenor of 20 years against sovereign obligations. The concessionality of the GCF loan will be passed on to SGDF and ultimately to subprojects.

34. The iTAP agrees that the needs of the recipient of the proposed programme are “Medium/High”.

1.5 Country ownership

Scale: High

1.5.1. Existence of a national climate strategy and coherence with existing plans and policies

35. China’s intended nationally determined contribution details its commitment to achieving certain climate change actions by 2030 including: to reach peak CO₂ emissions around 2030 while making efforts to peak even earlier; to lower CO₂ emissions per unit of GDP by 60-65 per cent from the 2005 level; to increase the share of non-fossil fuels in primary energy consumption to around 20 per cent; to increase the forest stock volume by around 4.5 billion m³ over 2005 levels; to proactively adapt to climate change by enhancing mechanisms and capacities to effectively defend against climate change risks in key areas such as agriculture, forestry and water resources as well as in urban, coastal, and ecologically vulnerable areas; and to progressively strengthen early warning and emergency response systems and disaster prevention and reduction mechanisms.

36. The “13th Five-Year Plan for Controlling Greenhouse Gas Emissions” includes specific tasks to control GHG emissions by 2020 in China and sets forth intermediary measurable emission control goals that are binding at the provincial and local government levels.

37. The “National Plan for Combating Climate Change” (2014–2020) states that addressing climate change is a major national strategy and requires that mitigation and adaptation tools and strategies are integrated in the country’s economic and social development.

38. “The Low Carbon Development Work Plan of Shandong Province (2017–2020)” is a plan to reduce CO₂ emissions and meet the carbon intensity goal in Shandong. The plan proposes that the carbon emissions per unit area of GDP will decrease by 20.5 per cent from the 2015 level by 2020. Shandong also sets the goal for CO₂ emissions to peak around 2027, earlier than the national goal of around 2030.

39. The proposed programme is in line with the climate strategy and plans of China and Shandong.

1.5.2. Capacity of accredited entities and executing entities to deliver

40. ADB, the AE, commenced its cooperation with and operation in China 32 years ago. ADB provided comprehensive policy advice for the implementation of critical reforms, specifically, assisting with the preparation of the eleventh, twelfth, and thirteenth Five-Year Plans.

41. From 2011 to 2016, the AE provided USD 2.88 billion in climate financing from its own resources to China, of which mitigation financing constituted USD 2.07 billion. This represented 17 per cent of the total climate financing from the AE for the period. Estimates for 2017 show that out of USD 4.5 billion in total climate financing, the AE invested USD 1.1 billion to mitigate GHG emission reductions in China. Climate related subprojects funded by the AE in the China energy sector in 2017 alone will result in annual GHG emission reductions of 12 million tCO₂eq.

42. The SDIHG is the co-executing entity (EE) mandated by the Shandong Provincial Government to set up SGDF. SDIHG is a wholly state-owned enterprise (40 per cent: Shandong Provincial Development and Reform Commission; 30 per cent: State-Owned Assets Supervision

and Administration Commission of Shandong Province; 30 per cent: Shandong Provincial Social Security and Pension Funds). All IFI sovereign guaranteed loans, including that of GCF, will be onlent by the Ministry of Finance, which is also the national designated authority (NDA), to the Shandong Provincial Government, and then to SDIHG.

43. SDIHG operates to support infrastructure development and to implement the provincial government's industrial transformation policies. Its business scope includes investment and management, capital operation, asset management, trusteeship, and investment advisory services. SDIHG currently has 100 employees.

44. As of 2017, SDIHG has 17 subsidiaries with ownership ranging between 40 per cent and 100 per cent. The subsidiaries are mainly involved in investment, trusteeship and advisory business, with some in creative industries, electronic technology and training. In 2017, the company recorded a net profit of CNY 289 million based on total assets of CNY 20.7 billion, total liabilities of CNY 5.3 billion, and total equity of CNY 15.4 billion. The SDIHG has directly invested in diversified sectors, including railways, power, airports, airlines, green buildings, petrochemicals, and culture and media, among others.

45. SDIHG appears to have financial and operational capacity to finance infrastructure transactions in Shandong. However, its capacity still needs to be developed to successfully discharge its EE function for the proposed programme. The TA of the AE can be effective to strengthen EE capacity in this regard.

1.5.3. **Engagement with national designated authorities, civil society organizations and other relevant stakeholders**

46. The AE has discussed the SGDF concept and processing schedule with the EE and NDA. The concept note endorsed by the Secretariat was shared with the NDA. The programme is included in the "Country Operations Business Plan 2017–2019" of ADB and is confirmed in the "Country Operations Business Plan 2018–2020" for 2018 with co-financing.

47. The NDA, in its capacity as Ministry of Finance, agreed to issue a sovereign guarantee to loans to be provided by IFIs, including GCF.

48. The AE interviewed financial institutions in the commercial banking sector, insurance industry and social pension funds for their possible participation in SGDF. The SDIHG is conducting market surveys to assess market demand, appetite from PIC investors and modalities for investment.

49. A no-objection letter issued by the NDA is attached to the funding proposal.

50. The iTAP considers that country ownership is "High".

1.6 Efficiency and effectiveness *Scale: Medium/High*

1.6.1. **Cost-effectiveness and efficiency regarding financial and non-financial aspects**

51. The AE projects that lifetime emission reductions during the 20-year tenor of SGDF will reach 50,000 tCO₂eq. Accordingly, the estimated cost per tCO₂eq is USD 30 per tCO₂eq, and the estimated GCF cost per tCO₂eq removed is USD 3.0 per tCO₂eq.

1.6.2. **Amount of co-financing**

52. The GCF co-financing ratio is estimated to reach 1:4.4 at the onset of SGDF, with the contribution of other IFIs, the provincial government and general partners. If the subsequent contribution of PICs is taken into account, the ratio will reach 1:8.8. Therefore the co-financing

ratio, taking into account total funding mobilized at the SGDF and subproject level, can be high although it takes place over a long period of time (20 years).

1.6.3. Programme/project financial viability and other financial indicators

53. In screening potential subprojects, SGDF applies both financial and non-financial criteria. The financial criteria include the estimated subproject investment and operations costs, as well as cash inflows. Only subprojects, which are commercially viable and exceed predetermined financial and economic hurdle rates, can be considered by SGDF.

54. A financial model attached to the funding proposal shows that SGDF will be able to provide an average financial return of 6.7 per cent. The financial internal rate of returns for private and public sector investors are projected to be 9.1 per cent and 3.6 per cent. The return to the investors over 6 per cent does not include an assessment of SGDF financial sustainability in the long run.

55. As per the projection prepared by the AE, SGDF is financially viable and sustainable.

1.6.4. Industry best practices

56. SGDF promotes the use of SOURCE. This innovative information technology platform was developed by the AE and is a joint initiative from multilateral development banks to improve project design and speed up the development of sustainable infrastructure projects. It is designed to help public sector agencies prepare, manage and publish their infrastructure projects and to attract private sector investment. The Sustainable Infrastructure Foundation, a not-for-profit Swiss Foundation headquartered in Geneva, operates and coordinates the provision of SOURCE in conjunction with multilateral development banks.

57. Green procurement will be adopted by SGDF based on European standards. It will be customized to meet China's needs for SGDF operation. The green procurement system in place allows the greening of the supply chain for manufacturing businesses and infrastructure projects.

58. The efficiency and effectiveness of the proposed programme can be significant. It is projected to have a competitive emission reduction cost of USD 30 per tCO₂eq and a GCF cost of USD 3.0 per tCO₂eq. The co-financing ratio is expected to be as high as 1:8.8 for the GCF contribution. However, the estimated efficiency can be achieved during the 20-year tenor of SGDF, so uncertainty remains. Accordingly, the iTAP considers the efficiency and effectiveness of the proposed programme as "Medium/High".

II. Overall remarks from the independent Technical Advisory Panel

59. The iTAP recommends the Board to consider the proposed programme with the following condition:

- (a) Prior to first disbursement, the AE will present for Secretariat review and approval an operation manual to be used by SGDF in its assessment and monitoring of subprojects. The manual should contain, among others:
 - (i) Financial and non-financial indicators and criteria as described in annexes 9 and 14 of the funding proposal, with further elaboration of their application;
 - (ii) Monitoring, evaluation and reporting structure and process expanded to include details based on annex 11 of the funding proposal;
 - (iii) Subproject screening and an investment decision-making process; and

- (iv) A pricing policy based on project risks but taking into account climate change impact potential and green procurement.

60. SDIHG capacity needs to be developed to successfully discharge its EE function for the proposed programme. The TA of the AE can be effective to strengthen EE capacity in this regard. The operational manual will ensure SDIHG to establish internally an effective and consistent assessment and approval process of climate change subprojects.

Response from the accredited entity to the Independent Technical Advisory Panel's assessment (FP082)

Proposal name: Catalyzing Climate Finance (Shandong Green Development Fund)

Accredited entity: Asian Development Bank (ADB)

Impact potential

The ADB Project Team would like to thank the Independent Technical Advisory Panel for their positive assessment of the impact potential of this Programme, through which the People's Republic of China (PRC) will access low concessional loan funding from the GCF for the first time. The Programme has a high impact on climate issues in Shandong Province of the PRC and beyond by establishing a scalable financing facility targeting mitigation and adaptation, addressing key climate priorities in the PRC, the biggest GHG net emitter and extremely vulnerable to climate impacts.

The PRC is classified an Upper Middle-Income Country in the same category as Brazil and Argentina, already recipients of Green Climate Fund (GCF) funding. The PRC is a developing member country of the Accredited Entity (AE), Asian Development Bank (ADB) and the Programme's cofinanciers Kreditanstalt für Wiederaufbau (KfW) and Agence Française de Développement (AFD). PRC requests 12% funding (\$180 million) of the total Project cost with the lowest concessionality available for GCF sovereign operations, to leverage over 5 times the overall Project with public and mostly private, institutional and commercial (PIC) funding.

The Programme will use catalytic funds from GCF to implement a climate financing platform that will maximize climate impact through:

- ensuring that SGDF addresses priority climate impacts and vulnerabilities in Shandong province through incorporating these priorities into its portfolio objectives;
- incorporating a financially sustainable project preparatory facility to develop a pipeline of sustainable and replicable sub-projects that will support project sponsors to achieve high levels of performance against GCF Investment Criteria; and
- structuring to financially incentivize subprojects performing at a high level against GCF Investment Criteria and leveraging PIC finance.

Annex 12 of the Funding Proposal summarizes a pipeline of 10 subprojects currently under consideration, including five subprojects with significant adaptation (with two subprojects prepared at pre-feasibility level, that have been shared with GCF Secretariat and ITAP and are included in Annex 2.1 and 2.2 of the Funding Proposal). The ITAP states that the Programme will “deliver GHG emission reductions of 2 million tons of carbon dioxide equivalent (tCO₂eq) annually, and 50 million to 75 million tCO₂eq over the 20-year tenor of SGDF.”

While ADB appreciates the positive “Medium/High” assessment, we wish to note that ITAP has previously assessed impact potential as “High” for projects in countries at a comparable state of development, with comparable amounts and terms of GCF funding requested, comparable levels of preparedness of sub-projects, but actually achieving lower outcomes in terms of lifetime GHG emission reductions and adaptation beneficiaries than this PRC Programme.

Paradigm shift potential

ADB notes that the assessment in this section concludes with “the independent TAP considers the paradigm shift potential of the Programme as ‘Medium/High’”. We therefore assume that the “Scale: Medium” in the heading of section 1.2 Paradigm Potential is an editorial error and would request that the heading be modified to reflect the conclusion.

Scaling-up:

The Programme shifts the global paradigm in the design of scalable financing facilities for mitigation and adaptation subprojects, addressing key climate priorities in the People’s Republic of China which, to-date, is the biggest GHG emitter and extremely vulnerable to climate impacts. By design, it incorporates GCF Investment Criteria into its assessment processes, assuring the high quality of the climate change mitigation and/or adaptation aspects of the portfolio pipeline of subprojects to be financed by SGDF.

The Programme is “a mechanism to mobilize and channel funding from PIC investors to promote climate change mitigation and adaptation interventions that would otherwise rely on long-term government funding or would not proceed due to a shortage of public funding or perceived high risk” (ITAP). As such it represents “a major shift in the way that public and private finance is allocated” (GCF Secretariat). Given this context, the Programme thus addresses key market failures on a continuing basis, and at a potentially increasing scale.

Regulatory Framework:

We note that the ITAP has recognized the policy development Component 4 of the Programme: No further comments.

Learning:

The International Financing Institutions (IFIs) operate in the PRC on the principles of inclusive development as well as global learning, where lessons learned from the Programme can be upscaled to the rest of the country as well as to other DMCs. The Concept of the Programme comes from ADB’s flagship publication (August 2017) “Catalyzing Green Finance, a Concept for Leveraging Blended Finance for Green Development”, an innovative public private financing platform approach mixing climate resilient criteria from the GCF Investment Framework with conventional financing criteria to crowd in PIC finance with catalytic funding from IFIs to finance climate resilient projects.

As such, the impact potential of the Programme is significant with already ongoing preparation of operations in Indonesia and Mongolia, indicative of the replication potential; three knowledge technical assistance (TA) on green and climate finance in the PRC with the Climate Change Department of the Ministry of Ecology and Environment and the People’s Bank of China and Guangdong Province are being approved in 2018 to upscale the Programme in the PRC.

As the GCF Secretariat has noted, “ADB is strategically working on the replication of the Programme through the region, including in Indonesia and other countries that are part of the Association of Southeast Asian Nations, with the potential to unlock large amounts of private investment in climate change in Asia”, adding further to our view that the paradigm shift potential of this Project is in fact “High”.

While ITAP has noted Component 4 in this section, in fact Component 3 contains the major learning, knowledge and system development activities of the project

Sustainable development potential

We very much appreciate that ITAP recognizes the multiple environmental, social, economic, and gender co-benefits of the project.

While ITAP describes the co-benefits at the Fund level, significant adaptation co-benefits will also be realized at the subprojects level – incentivized by the green indicator rating system compliant with the GCF Investment Framework and rewarded by differential lending terms for transformational and advanced benefits subprojects. The Programme will act as catalyst for broader adoption of policies and processes which will provide significant air, water and soil quality improvements in Shandong and upscaled in other provinces by the government.

Subprojects will be required, as a minimum, to demonstrate that it has considered ways to maximize the local economic development benefits of the proposed investment, where possible and incorporate gender sensitive design features to enhance women’s inclusion and participation. It should be designed to provide opportunities for enhancing employment either directly within the project or indirectly through enhanced productivity, skills and/or competitiveness. The Programme is designed to meet the AE’s Effective Gender Mainstreaming categorization (second highest level) and gender specific indicators are included in the monitoring framework.

The TA program funded under the ADB loan the Project Preparatory Facility supports these features and their implementation. Furthermore, the TA program will encourage active adoption of climate positive action by stakeholders involved in the subprojects, building their community resilience to climate change impacts and ensures that the investments benefits are shared by lower income / disadvantaged or vulnerable groups in terms of employment, community participation and quality of life.

Needs of the recipient

We thank ITAP for the positive assessment.

Country ownership

We thank ITAP for the positive assessment.

Efficiency and effectiveness

In this section, ITAP incorrectly states that lifetime emissions reductions of SGDF “will reach 50,000 tCO₂eq.” In fact, a conservative calculation of expected lifetime emissions reductions shows 50 million tCO₂eq.

We thank the ITAP for the positive assessment. Based on the mitigation cost, leverage, and exclusive focus on financing viability gaps, we would agree with the GCF Secretariat assessment and consider efficiency and effectiveness of this Programme as “High”.

Overall remarks from the independent Technical Advisory Panel:

ADB wishes to thank the ITAP for their review of the Funding Proposal.

However, we notice that in its overall remarks, ITAP recommends GCF Board to “consider” the proposed Programme, while for all other projects and programs in the last board meetings— including those with less favourable scaled ratings—ITAP recommended GCF Board to “approve” the projects or programmes.

Given the overall favourable assessments by the ITAP in the individual sections, ITAP may wish to modify the recommendation appropriately and consistent with previous practice.

Gender documentation for FP082

ANNEX 6.4 - PRC: Catalyzing Climate Finance (Shandong)

Shandong Green Development Fund Gender Action Plan

September 2018

CATALYZING CLIMATE FINANCE (SHANDONG GREEN DEVELOPMENT FUND) PROGRAMME

GENDER ACTION PLAN

Programme Outline

1. The Programme pilots an innovative, transformational and disruptive financing mechanism of \$1.5 billion to catalyze climate finance for a portfolio of bankable climate resilient projects in Shandong Province, People's Republic of China (PRC) through the Shandong Green Development Fund (SGDF). The tentative financing plan of the Programme is summarized hereafter:

Source	Amount (\$ million)	Share of Total (%)
ADB	100.00	6.7
AFD	87.20	5.8
GCF	180.00	12.0
KfW	116.30	7.8
Shandong Province and local governments	375.00	25.0
Private Institutional and Commercial	626.50	41.7
Fund Management Company	15.00	1.0
Total	1,500.00	100.0

*AFD and KfW contribution is in Euro; €75 million and €100 million respectively.
Source: ADB Project Team*

2. Shandong is a coastal province located in the eastern part of the country and a labor reservoir with a population of 99.47 million (2016). Shandong faces significant climate change challenges: (i) mitigation from energy, urban activities and industrial transformation; and (ii) adaptation from water resources, agriculture, coastal and ecological vulnerable areas, as a limiting factor for growth at the core of the water – food – energy nexus. Shandong tops the country's energy consumption and the number of motor vehicles, responsible for most of the greenhouse gases emission. The Programme supports the Shandong provincial government's proactive policies to decarbonize its economy through coal substitution and industrial transformation. Shandong has set a target to achieve the peaking of carbon dioxide emissions around 2027, three years earlier than the national goal.

3. The Shandong provincial government is establishing SGDF to transform its economy under an experienced financial intermediary, Shandong Development Investment Holdings Group (SDIHG), a State-Owned Enterprise fully owned by the provincial government. SDIHG is operating under commercial law and legally and financially autonomous. SDIHG's track record of successful investment provides a sound base for piloting the Programme. SDIHG has experience in ensuring that planned investments meet broader policy requirements, as well as more stringent criteria than common practice. The Province and SDIHG management are very supportive of making SGDF a world-class facility for mainstreaming climate finance with a dedicated Environmental Social Management System (ESMS) covering the social and safeguards dimension of the Programme.

4. The Programme’s subprojects pipeline under consideration for SGDF funding spans several sub-sectors and focuses on maximizing investment in climate change mitigation (75%), resulting in a conservative estimate of 50 million tons CO₂e over the lifespan of the subprojects and adaptation (25%) with 10 million direct beneficiaries (about 10% of Shandong Province) and 25 million indirect beneficiaries.

5. **Priority Investments:** SGDF investment priorities are determined from the climate analysis and assessment of sectors, where financing mechanisms can have most impact¹. In respect of mitigation sectors the priorities are: renewable energy including wind, solar, biomass and geothermal etc. addressing the main source of greenhouses gases reduction (GHG) emissions – the power sector; green (energy efficient) building and heating / cooling systems as the second most important source of emissions; low carbon transport - supporting new energy vehicles, bus rapid transit green corridors and urban slow-moving systems, addressing the third most important and rapidly growing sector under a business as usual scenario. Based on Provincial modelling of climate vulnerabilities, the adaptation priorities are: agricultural and urban water supply infrastructure; city flood resilience infrastructure (sponge cities through low impact development), including flood proofing urban lifeline systems such as water supply, drainage, power supply and communications; city greening and coastal protection.

6. In terms of the portfolio composition, mitigation priorities are determined by the level of CO₂ emissions produced annually and adaptation priorities by the numbers of people at risk from adverse effects disaggregating numbers by sex and vulnerable portion of the population. More sophisticated assessments of adaptation-related risks are theoretically possible, but with current models and data attempting to utilize these would involve making detailed assumptions with high degrees of uncertainty. In addition, in accordance with GCF policy, the recommendations of stakeholder focus groups assessing the relative subjective priority of attaining mitigation co-benefits (pollution reduction) and adaptation-related risks, a target allocation of 25% was established for adaptation investments. The resultant target portfolio allocation is shown in the following table.

Portfolio Weights					
Mitigation Sector	Carbon Emissions CO ₂ e Mtonnes	Percent	Adaptation Sector	Potential Beneficiaries Millions	Percent
Power	420.3936	51.22%	Flooding	8.2	5.91%
Green Building	105.2568	12.82%	Drought	6.9	4.97%
Transportation	51.4817	6.27%	Coast	14.4	10.37%
EE	38.4568	4.69%	Heat/ Greening	5.2	3.75%
Check totals		0.75			0.25

EE = Energy Efficiency

GENDER ASSESSMENT

7. **Gender and Poverty.** The PRC has made significant progress in reducing poverty among its citizens—from 49% in 1989 to less than 2% in 2017 and less than 1% in Shandong Province. However, the gender dimensions of poverty have not been systematically diagnosed so that they can be appropriately incorporated into poverty programs, and the PRC’s progress as measured by the Gender-related Development Index lags behind that of its general Human Development Index. Women spend

¹ Annex 14.2

substantially more time than men on household chores (about twice as much time), limiting the time they have for income-generating activities. Although women legally have equal rights with men, in practice they have difficulty attaining their rights, including for land use. Efforts to assist women often are made in a stereotypical manner by assuming avenues are limited by gender, and by promoting women-specific projects while not mainstreaming the integration of women into all poverty-reduction efforts.

8. **Economic Development.** During the transition to a market economy, the employment of men increased 4% more than that of women. In the age group 24 and over, more women than men have been laid off and far fewer have been reemployed. Moreover, the retirement age for women is lower than that for men, which results in their receiving smaller pensions than men do. Most working women are concentrated in service sector jobs and work in rural areas. Such work is considered to be low skilled and receives low pay. Wages rose dramatically in the last 20 years, but the income gap between men and women increased by 7.4%. Part of the problem results from women spending at least twice as much time as men on housework. Employers generally prefer to hire men because they assume women will devote greater time to family responsibilities than men, and to avoid providing maternity benefits. Labor laws keep women from employment in hazardous work, reinforcing stereotypes about women. Women who go into business tend to be in low-paying services. Although women have proven to be successful entrepreneurs, they have greater difficulty accessing credit than men, except for microcredit specifically targeting women.

9. **Policies for Gender Equality.** The PRC has an extensive legal system for the protection of women's legal rights, and the Constitution specifies that women and men have equal rights. The PRC is signatory to the UN Convention on the Elimination of All Forms of Discrimination against Women (CEDAW). The PRC adopted a law specifically for women in 1992, and amended it in the mid 2000 to include (i) the national policy of gender equality; (ii) the state's responsibilities in promoting national women's development and integrating it into the overall national economic and social program; (iii) clarification of the Government's responsibilities in protecting women's rights, and the role of the All China Women's Federation (ACWF); (iv) reaffirmation of the need for greater representation of women in government, and for addressing women's rights to education, work, and their person; and (v) prohibition of domestic violence and sexual harassment. The PRC has successfully established the legal basis for women's rights and built national women's organizations. ACWF, which was formed in 1949, has nationwide reach as well as international influence and contacts. The National Working Committee on Children and Women (NWCCW) was created in 1992 under the State Council to coordinate work pertaining to women and children, and to further their causes. It drafts and runs the national programs for women and children, intercedes with other government departments regarding protecting the rights of women and children. ACWF is publicizing the state policy on gender nationwide, and NWCCW will provide gender training in the Central Party School, to raise gender awareness of policymakers and increase their capacities in gender analysis and planning.

GENDER ANALYSIS (Shandong Province)

10. One of PRC's national basic policy is 'men and women are equal'. Central government issued the Outline of China Women Development respectively in 1995, 2001 and 2011 with additional regulations and policies to promote women's development. Shandong provincial government follows the central government's requirement and also made its own plans and policies, e.g., Outline of Shandong Women Development, the 12th and 13th Five-year Women's Development Plan. In recent years, the status of women in Shandong keeps improving. The gender analysis shows Shandong women's situation from the perspectives of population, employment, education and political participation with most results better than the national average:

- (i) Population: By the end of 2015, there were 48.16 million women in Shandong Province, accounting for 48.91% of the total permanent population, a bit higher than the national level of 48.78%.
- (ii) Employment: In 2015 there were 29.41 million female employees in Shandong Province, accounting for 44.3% of the total employees, higher than the national level of 42.9%. Of all urban employees, female occupied over 35%, a bit lower than the national level of 36.1%.
- (iii) Education: In 2015, the average education period of women in Shandong Province was 8.39 years. Girls and boys had the fully equal rights to receive the education. Even, the girls occupied 73.6% of all the students in the senior middle schools. Female students occupied 54.8% of all the students at the general higher education level, higher than the national level of 52.4%. Female postgraduates occupied 55.4% of all the postgraduates, higher than the national level of 49.7%.
- (iv) Political participation: In 2015, women in Shandong occupied 21.8% of total provincial Congress representatives, lower than the percentage of 23.4% in the national Congress. Women in Shandong occupied 22.9% of total provincial Political Consultative Committee representatives, higher than the percentage of 17.8% in the national Political Consultative Committee. Women occupied 23.4% of total officials in Shandong Province. All the urban residential committees and rural village committees had female cadres. Women occupied 33.0% of all the urban residential committee members, lower than the national level of 49.2%. Women occupied 28.6% of all the rural village committee members, higher than the national level of 22.9%.

11. However, there are still gaps between women and men in Shandong Province. More effort is required to improve Shandong women's status and accomplish gender equality. According to the third Women Status Survey in 2010, the employment ratio of women in Shandong Province was 77.3%, lower than that of men as 93.5%. The average per capita income of women was about 55.7% of men. One key reason was that women often had jobs with relatively low income. Of all the female employees, female middle and high-level administrative staff only occupied 5.8% while the ratio for the male was 11.8%. Of all the female employees with professional titles, women with middle and advanced professional titles occupied 10.6% while the ratio for the male was 20.3%.

12. **Potential impact of the Programme on women:** The present programme will focus on climate change: (i) mitigation from energy, urban activities and industrial transformation; and (ii) adaptation from water resources, agriculture, coastal and ecological vulnerable areas. Of all the beneficiaries, women in Shandong province will also benefit from the Programme with new employment opportunities. For example, during the construction period, the proposed solar highway, the international airport, and the clean fuel pellet factory will need various skilled and unskilled construction workers, so as well logistics services (e.g. chefs, waitress, and cleaners). In the operation and maintenance period, the solar highway, the agricultural and animal husbandry waste recycling facilities, and the Bus BRT will provide new job positions, including administrative jobs, engineers, workers, drivers, and logistics services.. The expansion of hydrogen production and pre-fabrication process, so as well the energy efficient stoves and boilers, may also increase the employment chances.

13. Women will also suffer less from the climate risks, e.g. the extreme heatwave. Through the development of green buildings, women will spend less time in taking care of the vulnerable families, e.g. the elderly and the children, who are easily affected by climate change. Thus, women could focus more on their work by relieving their family burdens. Women will save their commuting time and benefit more from the construction of public transport green corridors for they are the major users of public transport.

14. With gender-sensitive features designed for the subprojects, women will be able to apply practical skills and knowledge to enhance their livelihood and mitigate climate change, for example, through the use of renewable energy technologies, such as solar-power greenhouses. Women in the Programme area will also have equal access to clean energy as men, e.g. the hydrogen power and the green buildings.

15. Women will increase participation by involving in the plan, design, implementation, monitoring and evaluation stages of the Programme in general and subprojects in particular. Based on the empowerment activities including training, consultation, and participation, women will raise their awareness, increase their knowledge and build their capacity about climate-change issues. Accordingly, they can enhance their own confidence and improve their status in the pertinent decision-making process.

16. However, if the gender-sensitive approach has not been applied well, the positive impact of the Program on the women might be limited. Without appropriate gender-specific design, women may not be able to benefit equally from the Program.

17. **Women's contribution to the Programme:** Women, as well as men, can significantly contribute to combating climate change:

- (i) As the potential employees, women can contribute to the construction, operation, and maintenance of various subprojects.
- (ii) As the customers, women may have their own understanding about energy saving and climate change mitigation or adaptation because they often make household consumer decisions. Women can put forward their suggestions to the project design, e.g. the route of the public transport green corridor or the more efficient way of energy usage.
- (iii) As the affected group, women may support or oppose the projects, which will be important for the design and implementation, and thus affect the outcome of the Program. The awareness raising (e.g. the usage of clean energy, and the low-carbon trip mode) and knowledge/technology transferring (.e.g. the application of renewable energy technologies) will be crucial for gaining the support from the affected women.
- (iv) Also, women can contribute to sustainable climate change mitigation or adaptation through educating their children to recycle, save energy and invest in energy-efficient technologies.

Gender Categorization

18. Asian Development Bank (ADB)'s policy on gender and development (GAD), approved in 1998, adopts gender mainstreaming as a key strategy for promoting gender equity. This requires gender concerns to be treated as a cross-cutting theme influencing all social and economic processes. ADB's Strategy 2030 confirms gender equity as one of the five drivers of change to achieve the vision and strategic agenda of inclusive economic growth and to make the greatest impact on the development challenges in Asia and the Pacific. The GAD policy provides a policy framework; introduces institutional mechanisms to address gender concerns in ADB's program of activities; and supports a greater emphasis on gender issues in all ADB operations.

19. ADB's policy on GAD adopts mainstreaming as a key strategy for promoting gender equality and women's empowerment. The key elements will include the following:

- (i) "Gender sensitivity" to observe how ADB operations affect women and men; differently, and to take into account their different needs and perspectives in planning these operations;
- (ii) "Gender analysis" to assess systematically the impact of programs and projects on men and women and on their economic and social relationships.

- (iii) “Gender planning” to formulate specific strategies that result in equal opportunities and outcomes for women and men.
- (iv) “Gender mainstreaming” to ensure that gender concerns and women’s needs and perspectives are explicitly considered in all ADB operations, and that women and men participate equally in the decision-making process in development activities.
- (v) “Agenda setting” to assist developing member country (DMC) governments in formulating strategies to reduce gender disparities and in developing plans and targets for women’s and girls’ education, health, legal rights, employment, and income earning opportunities.

20. ADB have four gender mainstreaming categories:

- (i) category I: gender equity³ as a theme (GEN);
- (ii) category II: effective gender mainstreaming (EGM);
- (iii) category III: some gender elements (SGE); and
- (iv) category IV: no gender elements (NGE).

21. The Programme is designed to meet category EGM and directly improve women’s access to social services, and/or economic and financial resources and opportunities, and/or basic rural and urban infrastructure, and/or enhancing voices and rights, which contribute to gender equality and women’s empowerment. The Programme incorporates gender sensitive design features to enhance women’s inclusion and participation. Activities outlined in this Gender Framework focus on (i) ensuring women equitably benefit from the Projects to be financed (ii) Encouraging women’s participation, (iii) promoting employment and income generation opportunities for women, and (iv) building capacity for gender mainstreaming.

22. Requirements for the subprojects to be financed by SGDF include: (i) the social analysis conducted during the subproject preparation included careful consideration of gender issues highlighting both constraints and opportunities; (ii) specific gender design features are included in the majority of subproject outputs and/or components to facilitate and ensure women’s participation and access to subproject benefits; (iii) a Gender Action Plan (GAP) is prepared, reviewed by the Fund Management Company and included into the Concept Note for each subproject to be presented to the Investment Committee for consideration for funding by SGDF; (iv) the Concept Note discusses how the subproject will contribute to improving women’s access to or benefits from the subproject.

23. Subprojects’ pre-feasibility and feasibility studies provide the expected environmental, social and health, and economic and environmental co-benefits. They also set out the gender development impacts. The subproject should, as a minimum, demonstrate that it has considered ways to maximize the local economic benefits of the proposed investment, where possible and incorporate gender sensitive design features to enhance women’s inclusion and participation. It should be designed to provide opportunities for enhancing women’s employment either directly (see Cities Development Initiative in Asia sectoral guidelines as an example) or indirectly through enhanced productivity, skills and / or competitiveness.

24. Requirement at the Programme level is to include gender targets and performance and monitoring indicators in the Design and Monitoring Framework (DMF) and one covenant in the loan to support the implementation of the Gender Framework. The DMF prepared for the Programme includes one targeted gender outcome and two outputs gender indicators:

- (i) Outcome: *Women with increased resilience due to the use of advanced technologies and better knowledge to deal with climate changes reach at least 3.5 million by 2025 (2017 Baseline: 1.75 million);*
- (ii) Output:
 - *100 persons from project sponsors, SGDF and local government including 40% women improved skills and understanding in climate finance by 2025 (2017 baseline: 0);*

- *100 persons from project sponsors, SGDF and local government including 40% women improved skills and understanding in green procurement by 2025 (2017 baseline: 0).*

Gender Implementation

25. The implementation of the gender framework will be financed by the Fund Management Company through access from the TA program resources, if need be and monitored through collection of gender-disaggregated data. Following ADB Procurement Framework, two individual gender/social development specialists will be recruited to support the programme under the technical assistance program. The international consultant will have input of 5 person • months while the national 22 person • months to review the gender action plan prepared for the subprojets as well as capacity development of the subprojects sponsors. Gender results are reported into the Annual Performance Report (GCF Format). Gender dimension is incorporated into the overall project performance and monitoring system. ADB staff with gender expertise will participate in one review mission per year for the first 10 years of the Programme implementation and as required for the next 10 years.

APPENDIX 1. Gender Equality Results and Indicators²
For Preparation of Gender Action Plan
Environmentally Sustainable Development and Climate Change³

Country and Sector Level Outcome and Indicators

Gender Equality Outcome: Reduced vulnerability of poor women to climate change impacts, and strengthened capacity to manage these changes	
Gender Equality Dimension	Sample Gender Equality Indicators
Human capital	<ul style="list-style-type: none"> - Number of community-based adaptation activities that strengthen women’s access to resources for sustainable food production, renewable energy, and clean water sources - Number and percentage of poor women and men with increased resilience to deal with climate changes (e.g., use of climate-resilient crops and farming techniques, improved land management, clean technologies, increased knowledge and strengthened networks on climate change issues) - Time saved in collecting and carrying water, fuel, and forest products due to environmentally sustainable and climate change adaptation activities
Economic empowerment	<ul style="list-style-type: none"> - Number and percentage of women and men who access employment or increase their incomes due to climate change adaptation or mitigation activities
Voice and rights	<ul style="list-style-type: none"> - Evidence that climate change policies, strategies, and plans require the participation and involvement of poor women and men in developing and managing local adaptation and mitigation plans
Gender capacity building	<ul style="list-style-type: none"> - Evidence that policies, strategies, and plans are based on gender analysis of the different impacts of climate change on poor women and men, and include gender equality objectives for each sector of climate change adaptation and mitigation

Programme and Project level Results and Indicators

Gender Equality Dimension: Human Capital

² Extracted from ADB. 2013 *Toolkit on Gender Equality and Results Indicators*. Manila.

³ Results and indicators for environmentally sustainable development and climate change intersect with those listed in other chapters, such as energy; water supply and sanitation; transport; urban development; humanitarian and disaster preparedness and response; and rural development, agriculture, and food security.

Sample Results	Sample Indicators
Gender Equality Dimension: Human Capital	
<p>Increased fuel, water, and food security for poor women and men</p> <p>Increased capacity of poor women and men to adapt and respond to environmental changes</p>	<ul style="list-style-type: none"> - Number and percentage of women using renewable, sustainable, and efficient household energy sources - Number and percentage of women and men trained in energy-saving and sustainable agricultural technologies (e.g., adaptations to land management practices in marginal and fragile lands, adaptations related to changed rainfall patterns) - Number of households with improved access to water for agricultural and household uses Changes in women's workload compared with men's due to environmental changes and adaptation activities - Percentage of women and men involved in environmental protection or adaptation activities - Women's and men's views on the impact of project activities on their fuel, water, and food security and the viability of communal and other natural resources
Women and men benefit equitably from project training	<ul style="list-style-type: none"> - Number and percentage of women and men who receive training, by type of training (e.g., community- based early warning systems and procedures) - Number of training sessions targeted at women and men, by content area

Gender Equality Dimension: Economic Empowerment

Sample Results	Sample Indicators
Gender Equality Dimension: Economic Empowerment	
Equal employment for women and men in forest, land use, coastal and inshore fisheries, and marine management projects	<ul style="list-style-type: none"> - Number and percentage of jobs (person-days) generated for women and men in the community - Proportion of women employed in unskilled, technical, management, and supervisory roles, by sector
Targets met for women's employment in climate change agencies and projects	<ul style="list-style-type: none"> - Number and percentage of women and men employed in climate change agencies and as project and field staff - Evidence of the type of incentives designed to recruit women, increase their capacity, and provide career development
Equal access by women to small grants for climate change projects	<ul style="list-style-type: none"> - Number of awareness activities providing targeted information to women on climate change small grant opportunities - Number and percentage of women and men who receive finance for climate change small projects - Evidence that climate finance facilities include special windows for funding activities with women's groups and gender-sensitive guidelines for all funded activities, and employ women and men in fund management

Gender Equality Dimension: Voices and Rights

Sample Results	Sample Indicators
Gender Equality Dimension: Voice and Rights	
Women and men participate equitably in the development of local climate change adaptation and mitigation plans	<ul style="list-style-type: none"> - Number of community-based agreements and adaptation plans that have input from both women and men - Number and percentage of women and men who attend community-based meetings on natural resource management (e.g., land, forests, coastal and inshore, marine, water supply) - Changes in adaptation or mitigation plans and initiatives due to consultation with women
The rights of women and men displaced by climate change problems are protected	<ul style="list-style-type: none"> - Evidence of the number and type of activities specifically targeted at women and men who have migrated due to degradation of natural resources caused by climate change
Strengthened capacity of women's organizations to analyze climate change policy, regulatory frameworks, and programs (including their impact on women's and men's time burdens and access to natural resources)	<ul style="list-style-type: none"> - Number of research activities that involve women in documenting women's and men's local knowledge of resource management and changes in resource availability and use - Number of women's organizations involved in the assessment and management of environmental hazards - Number and percentage of women and men in civil society organizations trained in gender analysis of environmental impacts and climate change adaptation and mitigation programs - Number of women's groups engaging in national debate and analysis of environmental impacts, and climate change policy, regulatory frameworks, and programs

Gender Equality Dimension: Gender Capacity Building

Sample Results	Sample Indicators
Gender Equality Dimension: Gender Capacity Building	
Strengthened capacity of environmental agencies and other stakeholders to ensure that women and men benefit equitably from climate change adaptation and mitigation investments	<ul style="list-style-type: none"> - Evidence that sex-disaggregated information on women's and men's access to and use of natural resources (land, waterways, forests, fisheries) and their links to environmental challenges is documented and applied to program planning and implementation - Amount of research funding dedicated to natural resource management and adaptation focused on activities undertaken by poor women, including crops farmed by women, forest products, fibers, coastal fishing, and water uses - Number of training sessions held with environmental agencies and other stakeholders on participatory techniques to involve women and men; and number and percentage of women and men attending - Evidence that contracts with implementing agencies (e.g., nongovernment organizations) require consultation with women, employment of female staff and community facilitators, and implementation of gender strategies based on gender analysis - Number of executing and implementing agencies that employ staff with specialist expertise on gender and climate change - Number of training and awareness sessions with environmental agencies and other stakeholders on gender issues in environmentally sustainable development and climate change; and number and percentage of women and men attending
<ul style="list-style-type: none"> - Increased capacity to consult with women and men on climate change impacts, and respond to women's needs and priorities - Increased understanding of the different impacts of climate change and adaptation and mitigation strategies on poor women and men 	

Appendix 2 Gender Action Plan at the Programme Level

Actions	Indicators/Targets	Budget and sources	Timeframe	Responsible Agencies
Objective 1: Ensuring women equally benefit from the Programme				
1.1 Include gender-specific design features	<ul style="list-style-type: none"> At least one gender/social specialists recruited working closely with design institutes At least 40% of local women participate in consultation meetings during design period One GAP prepared for each project 	Project budget	2019–2024	SDIHG, project PMOs, Design institutes, gender/social specialists
1.2 Implement the GAPs	<ul style="list-style-type: none"> At least one gender/social specialists recruited working closely with the IA and project PMOs One staff of IA and each project PMO responsible for GAP implementation and monitoring Trainings about Gender mainstreaming and implementing GAPs provided to the IAs 	Project budget	2019–2024	SDIHG, project PMOs, gender/social specialists
1.3 Monitoring the GAP implementation	<ul style="list-style-type: none"> Sex disaggregated information collected routinely Gender results reported into the Annual Performance Report (GCF Format) 	Project budget	2019–2024	SDIHG, project PMOs, gender/social specialists
Objective 2: Encouraging women's participation				
2.1 Promote women's participation in awareness campaign	<ul style="list-style-type: none"> At least 40% local women participate in awareness campaign about project-specific climate change mitigation and adaptation 	Project budget	2019–2024	SDIHG, project PMOs, gender/social specialists, local governments, communities/villages
2.2 Ensure women's participation in public hearings in case of raising tariff	<ul style="list-style-type: none"> Women's voices should be heard during the public hearings for heat tariff. Female participants should not be less than 40%. 	Project budget	2019–2024	SDIHG, project PMOs, local governments
2.3 Satisfaction survey on improved services	<ul style="list-style-type: none"> At least 60% local women surveyed report the satisfaction 	Project budget	2019–2024	SDIHG, project PMOs, gender/social specialists, local governments, communities/villages
Objective 3: Promoting employment and income generation opportunities for women				
3.1 Ensure female employment in construction jobs	<ul style="list-style-type: none"> 30% of women are employed as skilled and unskilled workers Number of women from poor household in unskilled jobs 100% work sites with facilities 	Project budget	2019–2024	SDIHG, project PMOs, contractors

	designed conveniently for female workers			
3.2 Ensure female employment in maintenance and operation jobs	<ul style="list-style-type: none"> At least 30% women employed in new skilled jobs generated by the projects At least 50% women employed in new unskilled jobs generated by the projects Number of poor women employed in unskilled jobs 	Project budget	2019–2024	SDIHG, project PMOs, contractors
3.3 Ensure equal pay for equal work	<ul style="list-style-type: none"> Wages paid to local women and men by type of jobs 	Project budget	2019–2024	SDIHG, project PMOs, contractors
Objective 4: Capacity building for gender mainstreaming				
4.1 Technology and skills trainings provided to local people when necessary	At least 40% women of trainees	Project budget	2019–2024	SDIHG, project PMOs, local Women Federation
4.2 Professional training provided to IA, PMO and local Women Federation's staffs	At least 40% women of trainees	Project budget	2019–2024	SDIHG, project PMOs, local Women Federation
