



**ASIAN INFRASTRUCTURE  
INVESTMENT BANK**

PD000386-CHN  
January 13, 2022

---

**Project Document  
of the Asian Infrastructure Investment Bank**

**Sovereign-Backed Financing**

**People's Republic of China  
Zhengzhou International Logistics Hub Project**

**Currency Equivalents**

(As at date, December 31, 2021)

Currency Unit – Renminbi (RMB)

RMB1.00 = USD0.16

USD1.00 = RMB6.35

Euro (EUR)

EUR1.00 = USD1.14

USD1.00 = EUR0.88

**Borrower's Fiscal year**

Jan. 1 – Dec. 31

**Abbreviations**

AIIB	Asian Infrastructure Investment Bank
CAGR	Compound Annual Growth Rate
COVID-19	Coronavirus Disease 2019
CR	China Railway
DA	Designated Account
DDR	Due Diligence Report on the Relocation of Resettlement
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EMP	Environmental Management Plan
ESP	Environmental and Social Policy
ESS	Environment and Social Standards
EU	European Union
FSR	Feasibility Study Report
GDP	Gross Domestic Product
GRM	Grievance Redress Mechanism
GWP	Global Warming Potential
HGMGC	Henan Goods & Materials Group Corporation
HPDF	Henan Provincial Department of Finance
IMF	International Monetary Fund
LCL	Less than Container Load
MDB	Multilateral Development Bank
MOF	Ministry of Finance
NDRC	National Development and Reform Commission
NPV	Net Present Value
O&M	Operations and Maintenance
PMO	Project Management Office
PP	Procurement Plan
PPM	Project-affected People's Mechanism
SBF	Sovereign-Backed Financing
SIA	Social Impact Assessment
SMP	Social Management Plan
SOE	State-Owned Enterprises

TEU	Twenty-foot Equivalent Unit
ZETDZ	Zhengzhou Economic and Technological Development Zone
ZIH	Zhengzhou International Hub Development and Construction Co., Ltd.
ZMFB	Zhengzhou Municipality Finance Bureau
ZMG	Zhengzhou Municipality Government

## CONTENTS

<b>1. SUMMARY SHEET .....</b>	<b>1</b>
<b>2. PROJECT DESCRIPTION .....</b>	<b>3</b>
A. Project Overview .....	3
B. Rationale.....	4
C. Components.....	5
D. Cost and Financing Plan .....	7
E. Implementation Arrangements .....	7
<b>3. PROJECT ASSESSMENT .....</b>	<b>10</b>
A. Technical .....	10
B. Economic and Financial Analysis .....	11
C. Fiduciary and Governance .....	13
D. Environmental and Social.....	14
E. Risks and Mitigation Measures.....	17
<b>ANNEX 1: RESULTS MONITORING FRAMEWORK .....</b>	<b>19</b>
<b>ANNEX 2: DETAILED PROJECT DESCRIPTION .....</b>	<b>21</b>
<b>ANNEX 3: DETAILED ECONOMIC ANALYSIS.....</b>	<b>26</b>
<b>ANNEX 4: DETAILED FINANCIAL ANALYSIS .....</b>	<b>30</b>
<b>ANNEX 5: MEMBER AND SECTOR CONTEXT.....</b>	<b>32</b>
<b>ANNEX 6: SOVEREIGN CREDIT FACT SHEET .....</b>	<b>34</b>

## 1. Summary Sheet

Project No.	000386
Project Name	Zhengzhou International Logistics Hub
AIIB Member	People's Republic of China
Borrower	People's Republic of China
Project Implementation Entity	Zhengzhou International Hub Development and Construction Co., Ltd. (ZIH)
Sector	Transport
Sub-sector	Multimodal logistics
Project Objective	To facilitate cross-border trade by enhancing freight service efficiency of the containerized China Railway (CR) Express trains connecting Zhengzhou China to Europe and Central Asia.
Project Description	<p>The project provides long-term Sovereign-Backed Financing (SBF) to ZIH to expand its freight facilities:</p> <ol style="list-style-type: none"> <li>1. Multimodal Cold Storage Facilities;</li> <li>2. Parallel Vehicle Imports Facility;</li> <li>3. Bonded Logistics Center and</li> <li>4. Upgrade the Multimodal Logistics Information Platform.</li> </ol> <p>These facilities are integral value-added components to the CR Express operated by ZIH, connecting China and European/Central Asian countries.</p>
Implementation Period	<p>Start Date: Q4 2021</p> <p>End Date: Q2 2026</p>
Expected Loan Closing Date	Q2 2027
Cost and Financing Plan	<p>Project cost: EUR228 million (USD259 million equivalent) including interest during project implementation.</p> <p><u>Financing Plan:</u></p> <p>AIIB loan: EUR132 million (USD150 million equivalent)</p> <p>ZIH: EUR96 million (USD109 million equivalent)</p>
Size and Terms of AIIB Loan	Euro-denominated loan of up to USD150 million equivalent. Final maturity of 15 years, and average maturity of 9.72 years, including a grace period of 4 years. AIIB's standard interest rate for sovereign-backed variable spread loans will apply.
Environmental and Social Category	B
Risk (Low/Medium/High)	Medium
Conditions of Effectiveness	Subsidiary Agreement(s) in forms to the satisfactory of the Bank.

Key Covenants	As per General Condition for Sovereign-backed Loan. <sup>1</sup> In the Project Agreement: Establishment of Zhengzhou Economic and Technological Development Zone (ZETDZ) <sup>2</sup> -led Project Coordination Committee within 45 days of loan effectiveness.
Conditions for Disbursement	In addition to the Loan Agreement Withdrawal Conditions, counterpart funding availability for each contract package as per the procurement plan (PP).
Retroactive Financing (Loan % and dates)	Exact contents to be agreed prior to Negotiation, limited to 20% of AIIB loan amount for eligible costs incurred 12 months prior to Loan Agreement signing.
Policy Waivers Requested	None
Policy Assurance	Confirmed on January 25, 2022.
Economic Capital (Ecap) Consumption	USD1.44 million (1.2%)

President	Jin Liqun
Vice President	Konstantin Limitovskiy
Director General	Supee Teravaninthorn
Manager	Gregory Liu
Team Leader	Edwin Yuen, Senior Private Sector Operations Specialist
Co-Team Leader	Runze Yu, Investment Operations Specialist – Transport
Team Members	Yi Geng, Senior Financial Management Specialist Susrutha Goonasekera, Senior Social Development Specialist Yunlong Liu, Senior Procurement Specialist Olga Dyakova, Senior Treasury Officer - Treasury Client Solutions Liu Yang, Counsel - Investment Operations Anne Ong Lopez, Young Professional Chongwu Sun, Senior Environment Consultant Yongxi Liu, Senior Admin Assistant

<sup>1</sup> [https://www.aiib.org/en/policies-strategies/\\_download/general-conditions/General-Conditions-for-Sovereign-backed-Loans\\_December\\_7\\_2020.pdf](https://www.aiib.org/en/policies-strategies/_download/general-conditions/General-Conditions-for-Sovereign-backed-Loans_December_7_2020.pdf)

<sup>2</sup> ZETDZ is a national economic and technological development zone with a total area of 158.7 square kilometers in Zhengzhou. The development goals of ZETDZ are mainly to improve the quality of foreign investment, to develop modern manufacturing, to optimize the export structure, to develop high-tech industries, to develop high value-added service industries, and to promote the transformation of ZETDZ into a multi-functional comprehensive industrial zone.

## 2. Project Description

### A. Project Overview

1. **Project Objective.** The objective of the Project is to facilitate cross-border trade by enhancing freight service efficiency of the containerized CR Express trains connecting Zhengzhou China to Europe and Central Asia.

2. **Project Description.** The Project provides long-term sovereign-backed financing to ZIH to expand its logistics facilities and upgrade information platform. The Project is integral and value-adding to ZIH's CR Express operations and commercialization.

3. CR Express has emerged as a rapidly growing intermodal freight solution since its inception in 2011. It provides containerized railway freight services with dedicated routes and schedules connecting China to Central Asia and Europe. Zhengzhou is one of the five CR Express Consolidation Hubs.

4. ZIH provides rail logistics service and runs CR Express in Zhengzhou. ZIH has achieved steady growth in number of trains and trade volume since its inaugural trip on July 18, 2013. From 2014 to 2019, ZIH-operated trips have grown at 63% per year. ZIH has expanded along the cross-border trade value chain from stop-to-stop services to door-to-door services. It increases its market share by focusing on high-quality value-added services, such as Less than Container Load (LCL)<sup>3</sup> shipments, cold chain service, and customs clearance. ZIH emphasizes customer experience, using digitalization to improve efficiency and build a global network. In 2020, ZIH operated 1,126 trains with a total of 720,000 tons of cargo. ZIH aims to operate 1,500 trains annually by 2024.

5. **Expected Results.** Proposed results indicators are:

- a. Increase in cross-border trade volume measured by volume of containers shipped and number of trains operated annually;
- b. Improvement in CR Express operational efficiency measured by annual average load factor per westbound train and annual average return trip ratio<sup>4</sup>.

6. **Expected Beneficiaries.** AIIB member countries in Europe and Central Asia benefits from growing trade and business cooperation promoted by the enhanced connectivity due to CR Express. The EU is the largest trade partner of China's and core customer of the CR Express services<sup>5</sup>. The future CR Express demand growth with EU countries is also very promising. For the China- Central Asia and China-Russia trade, rail has been playing a crucial role in the past decades as one of the key freight modes and will continue to maintain relatively stable share in the future growth.

---

<sup>3</sup> LCL refers to small freight shipment that does not require the capacity of one container. A freight forwarder may consolidate by putting together multiple LCL shipments. Fare for each shipment is calculated by weight or volume.

<sup>4</sup> Annual average load factor refers to the number of loaded containers p.a. divided by the total number of containers p.a. in the same year. Return trip ratio refers to the number of eastbound trains over the total number of trains departed in the same year.

<sup>5</sup> 70 – 80% of CR Express trains go to Europe.

7. In addition, as China's production centers relocate from coastal areas to central and western provinces, CR Express serves as strategic propellers for its hinterland development and acceleration of industrial agglomeration, through an efficient intercontinental freight mode to bypass inland bottlenecks. It brings new investment opportunities to the market both in China and its trade partners. It is also worth mentioning that CR Express has been playing a stabilizing role in international supply chains during Coronavirus Disease 2019 (COVID-19), ensuring the delivery of critical supplies when the air & maritime freight were heavily influenced by the pandemic.

8. The Project supports ZIH's commercialization through positive cash flow generated from the Project. Finally, the Project would contribute to the digital transformation of logistics industry and development of value-added supply chain services in Henan province. The Project is expected to create 145 new operational jobs of which 74 would be female employees.

## B. Rationale

9. **Strategic Fit for AIIB.** The Project aligns with the AIIB's *Connectivity and Regional Cooperation* thematic priority: i) the proposed Project components promote and facilitate trade between China and European/Central Asian countries enabling diversification of imports and exports; ii) intensifying trade would further catalyze cross-border infrastructure development<sup>6</sup> and iii) finally trade would promote deeper regional cooperation along the CR Express corridors which entails enhancing institutional capacity, easing of customs clearance procedures and reducing rail network usage fees.

10. The Project aligns with Bank's thematic priority on *Technology-enabled Infrastructure*. Using technology, ZIH could: i) increase operational efficiencies through integrating disparate information systems<sup>7</sup>; ii) capture high margin of the LCL business and iii) reduce goods losses through real-time monitoring of the cold-chain containers.

11. The Project aligns with AIIB's *Green Infrastructure* thematic priority. CR Express enables modal shift of freight transport from high carbon intensive (sea) to a lower one (rail). The Project also adopts energy efficient design and reduces the use of high global warming potential (GWP) refrigerant in the cold storage facilities.

12. **Value Addition by AIIB.** The key value additions include:

- a. *Global Best Practices:* AIIB has engaged an international firm in preparing the project, by sharing experiences in digitalizing and streamlining operations at major global multimodal ports;
- b. *Connecting Henan Province to the World:* Zhengzhou is the only city in central China selected as the CR Express Consolidation Hub. In participating ZIH's development, AIIB would contribute to Henan province's cross-border connectivity through trade facilitation; and

---

<sup>6</sup> For example, the Western Eurasia Rail Corridor was emerged in the 1990s; however commercial rail freight operation becomes routine only after the inaugural CR Express in 2011.

<sup>7</sup> An example is reduced customer booking and invoicing time.



- c. *Foster Corporate Development*: Governments play key roles in the early stage of CR express market development. The Project will support ZIH during its transition from a government-supported local State-Owned Enterprises (SOE) towards a fully commercialized entity. Specifically, the Project supports ZIH's business growth strategy in providing one-stop, value-added services that would diversify its revenue streams; the Project also includes ZIH's digitalization, a key leverage in supporting ZIH commercialization. It has demonstrative effect for other similar operations.
13. **Value Addition to AIIB**. The key value additions are as follows:
- a. *Green Infrastructure*. Partially qualified as climate finance, the Project would contribute to achieving 50% climate finance specified in the Corporate Strategy;
- b. *Local SOE*. SOE is likely to play a role in achieving 50/50 sovereign and non-sovereign financing target by 2030. Whilst this is an SBF, it offers AIIB an opportunity to learn how to work with market oriented local SOEs for future non-sovereign operations;
- c. *Understanding Information Platform*. During implementation, AIIB would gain experiences in how the upgraded information platform would promote efficiencies. This would enable AIIB to assess appropriate technology options for future similar operations and
- d. *Project Opportunities for Cross-Border Connectivity*. With increasing demand for intercontinental containerized rail freight, infrastructural constraint is obvious. Targeted improvement to infrastructural bottlenecks would increase capacity alongside the CR Express routes. The Project would not only expand AIIB's sector technical expertise and knowledge, it provides a steppingstone for selective development of infrastructure investment opportunities.
14. **Lessons Learned**. As this is Multilateral Development Bank's (MDB's) first engagement in the CR Express market, the Bank has engaged an international consultant to conduct a study on the intermodal ports around the globe with direct rail connections. General trends observed include digitalization for data sharing and efficiency boost among stakeholders, as well as incorporating value-added services for new points of profit growth. Both were well captured in designing this Project.
15. AIIB has approved nine projects in China. The key lessons learned include: i) Chinese clients usually have the technical know-how and strong project execution capacities and they typically look for value additions; ii) Chinese clients are open and eager for innovations with demonstrative effects which would allow AIIB to test new project concepts and iii) China has well established domestic procedures including procurement and E&S assessments. Enhancing mutual understanding by aligning AIIB's project cycle would help achieve timely project preparation and implementation.

## C. Components

16. **Overview**. ZIH faces several financial and operational challenges: i) fierce competition with other Chinese CR Express operators leading to reliance on government support; ii) cross-border infrastructure bottlenecks and iii) imbalance of import/export

cargo demands between China and Central Asian/European countries translating into low return trip ratio affecting ZIH's revenue.

17. ZIH is actively addressing these issues through implementing a series of market-oriented business practices: i) improving its operational efficiency by expanding sources of returning cargo; ii) diversifying its revenue sources and iii) providing more value-added services<sup>8</sup> along freight value chain. By financing the Project components described below, AIIB would support actions i)-iii) above:

18. **Component 1 – Multimodal Cold Storage Facilities (USD52 million).** Expansion of the existing Multimodal Freight Distribution Center operation which has a total planned land area of 17.4 hectares. The current turnover is about 150,000 Twenty-foot Equivalent Unit (TEU) p.a. with existing temporary on-site cold storage facilities. The long-term annual turnover target is 300,000 TEU. Component 1 consists of constructing two new multi-story cold storage facilities, with a total floor area of 58,179 square meters. Both facilities could support 50,000 tons (static volume) of refrigerated and frozen goods. The component would further expand ZIH's capacity in handling perishable imported goods from Europe.

19. **Component 2 – Parallel Vehicle Imports Facility (USD100 million).** ZIH is already operates vehicle import business at a limited scale due to lack of suitable facilities. The vehicle imports facility would offer diverse, one-stop functions including exhibition, vehicles inspections, modifications, trade and customs clearance, auto parts sales, and supply chain finance. When built, it would have import capacity to 30,000 vehicles annually serving Henan province and its neighboring central China provinces. The full facility includes 5 buildings with a total construction area of 176,503 square meters.

20. **Component 3 – Bonded Logistics Center (USD95 million).** The component builds around the concept of a gazette customs supervision area with bonded functions. Goods in the Type-B<sup>9</sup> bonded logistics center is temporarily exempted from customs duty. It benefits import traders as it would lower the working capital requirements. Construction consists of buildings with a total floor area of 153,940 square meters covering five warehouses and one business service center.

21. **Component 4 – Multimodal Logistics Information Platform Upgrade (USD5 million).** This component upgrades and integrating the existing systems to support the overall ZIH operational efficiency. This is achieved through reducing duplication of work in the booking-quoting-shipping activities, custom clearance, other process by establishing data exchange mechanism and providing real-time quotes. After the update, the real time quote system can automatically retrieve data from subsystems, reducing booking handling time from 60 minutes to 10 minutes. Apart from data center expansion and software integration, this component also includes the upgrade of visualization system, smart inspection and monitoring system.

---

<sup>8</sup> e.g., smart online booking for LCL service.

<sup>9</sup> Type-A bonded logistics center refers to the ones operated by one enterprise and can only be used by that enterprise; Type-B bonded logistics center refers to the ones operated by one enterprise but used by multiple enterprises, who engage in bonded warehousing and logistics business.

22. Project includes those components with a multifaceted consideration: i) the economic benefits and additional benefits in realizing the project objective; ii) the profitability potential to contribute to the ZIH company level, reducing its reliance on government support and iii) the synergy among components. For example, the Bonded Logistics Center would functionally support the cold storage and the vehicle importation facility, which are all together supported by the information platforms.

#### D. Cost and Financing Plan

23. **Cost estimates.** A project cost estimation model was prepared jointly by the Feasibility Study Report (FSR) consultant and ZIH. The sources and basis were reviewed.

**Table 1.** Project Cost in USD million

No.	Item	Project	AiIB <sup>10</sup>	ZIH	AiIB /Project
1	Multimodal Cold Storage Facilities <sup>11</sup>	51.8	39.6	12.2	76.5%
2	Parallel Vehicle Imports Facility	99.6	73.1	26.4	73.5%
3	Bonded Logistics Center	95.5	39.6	55.9	41.5%
4	Multimodal Logistics Information Platform Upgrade	5.1	-	5.1	0.0% <sup>12</sup>
5	Interest during the construction period	4.1	-	4.1	
6	Front-end Fees	0.3	0.3	-	100.0%
7	Commitment Fee	1.0	-	1.0	0.0%
8	Working Capital	2.0	-	2.0	0.0%
	<b>Total</b>	<b>259.4</b>	<b>152.7</b>	<b>106.7</b>	<b>58.9%</b>

24. China is the Borrower, AiIB loan will be on-lent to the Henan Provincial Government, then to the Zhengzhou Municipality Government (ZMG) and ultimately to ZIH. ZIH will assume the foreign exchange rate and interest rate variation risks of the loan.

25. AiIB will finance USD150 million (or 58.9%) of the project cost. The remaining USD109 million (or 41.1%) would be financed through counterpart funds provided by ZIH, which is a SOE found in 2013 and a joint venture between ZETDZ and Henan Goods & Materials Group Corporation (HGMGC)<sup>13</sup>.

#### E. Implementation Arrangements

26. **Implementation Management.** ZIH is the project implementation entity. It has established the Project Management Office (PMO)<sup>14</sup> responsible for project preparation and implementation including monitoring and evaluation. ZIH's Construction

<sup>10</sup> Costs inclusive of taxes and duties of 9% and 13% respectively, also included in AiIB loan amount.

<sup>11</sup> This component is considered as climate mitigation finance so AiIB maximizes its financing in this component.

<sup>12</sup> Because of its small size, Component 4 is not financed by AiIB but it is a critical component of the Project and included in the Results Monitoring Framework.

<sup>13</sup> HGMGC is a trade and logistics enterprise directly managed by the State-owned Assets Supervision and Administration Commission of Henan Provincial People's Government. It is the largest provincially-managed modern trade logistics enterprise in Henan Province. Its predecessor was the Henan Provincial Materials Department before transforming into an SOE.

<sup>14</sup> Headed by ZIH's Chairman.

Department will take the leading role in substantiating the PMO by drawing resources from four corporate functions of ZIH: i) strategic planning; ii) finance; iii) engineering and iv) procurement/contract management. The latter two functions reside in the Construction Department. Construction supervision consultants<sup>15</sup> will be hired by ZIH to monitor the construction progress, safety, and quality. Weekly meetings will be held among ZIH, the contractor(s), and the construction supervision consultants.

27. **Inter-governmental Coordination.** A Project Coordination Committee led-by ZETDZ<sup>16</sup> will be set up specifically for this Project to resolve any inter-governmental issues.

28. **Procurement.** The procurement of goods, works, non-consulting services and consulting services financed by the AIIB loan proceeds shall comply with the *AIIB's Procurement Policy (January 2016)* as well as the *Interim Operational Directive on Procurement Instructions for Recipients (June 2, 2016)*. The specific procurement provisions under *Section II Procurement of Goods, Works, and Services by Public Entities* under Procurement Instructions for Recipients shall apply to the procurement of the Project.

29. PMO will take charge of the whole procurement process and contract management, by staff from Engineering Department. The Engineering Department is equipped with adequate number of qualified and experienced procurement and technical staffs to undertake the management and supervision for project implementation.

30. To strengthen the ZIH technical and management capacity, ZIH has already employed a professional procurement agent to assist in procurement preparation and handle the overall procurement process. Construction supervision consultants will also certify contractor payments.

31. ZIH has prepared and submitted the draft Project Delivery Strategy as well as the PP, which AIIB has reviewed and agreed during project appraisal and would be further updated before Negotiation (if needed). The specific procurement arrangements for the project including contract packaging and procurement procedures have been clearly specified in the PP. It is prepared based on the Project Delivery Strategy and assessment of ZIH capacity, analysis of project operating factors, as well as market analysis and survey for high-value high-risk procurement.

32. The purpose of the Bank's procurement assessment is to identify major potential procurement related risks and put forward corresponding mitigation measures to be incorporated into the specific procurement procedural arrangements, tender documents as well as the conditions of contract. This is to ensure the selection of qualified and capable contractors to undertake the projects successfully in a fit-for-purpose and value-for-money approach. Any update of the PP during implementation shall be subject to review and no-objection of AIIB before commencement of the procurement process.

---

<sup>15</sup> Total projected construction supervision cost of USD2.48 million or around 1% of construction costs has been budgeted.

<sup>16</sup> ZIH locates in ZETDZ.

33. According to the PP, the contracts to be financed by AIIB loan include works and goods contracts for development of all three project components. Given the cost estimate, size, nature, and complexity of those contracts, the procurement method applied to the project will be National Competitive Tender except for two contract packages with values greater than USD41 million. Unless there are justifications satisfactory to AIIB, they would be procured under International Open Competitive Bidding. As such, ZIH's draft tender documents for procurement of works and goods have been prepared and compiled to the satisfaction of AIIB in terms of compliance with AIIB Procurement Policy requirements and will be used for the project.

34. AIIB will carry out procurement supervision over all contracts financed by AIIB loan through procurement prior review and post review. Procurement post-review will be conducted on a regular or annual basis. ZIH will be responsible for handling procurement related complaints. However, any complaint received and the draft corresponding response regarding a prior review contract shall be submitted to AIIB for prior review and no-objection.

35. **Financial Management.** Project designated financial staff in ZIH and related government finance bureaus have all been assigned. ZIH's Project financial management system, including proposed funds flow arrangements have been reviewed to ensure project funds will be properly used. Interim project financial report in the format agreed by the Bank will be prepared and submitted to the Bank on a semi-annual basis to reflect sources and uses of project funds. The project annual audit report issued by Henan Provincial Audit Office will be submitted to the Bank within six months after the end of the year.

36. **Monitoring and Evaluation.** The overall responsibility for monitoring project results (see Results Monitoring Framework in Annex 1) will be with ZIH. It will produce progress reports, supported by the construction supervision consultant. The following key reporting requirements have been agreed.

**Table 2.** Key Reporting Requirements

<b>Report</b>	<b>Timing of Reporting</b>
Reporting of baseline and progress data indicated in the Results Framework and the Environmental Management Plan (EMP)	Semiannual, included in the semiannual project progress reports
Semiannual project progress reports	Semiannual, within one month after the end of the second quarter and one month after the end of the fourth quarter each year
Audited project accounts and financial statement	Annual, not later than six months after the closure of fiscal year (end of December)

### 3. Project Assessment

#### A. Technical

37. **Land.** Three land parcels have been acquired by ZIH from the government for Components 1, 2, and 3 respectively. They are aligned by the sides of a major urban road (Jingbei 4<sup>th</sup> Road). The terrain of all sites is relatively flat, in proximity to major truck road corridors in Zhengzhou. No significant geological risks have been identified.

38. **Technical Assessment.** The Project Team reviewed the final draft of FSR together with the FSR Consultant and ZIH, it was found that the contents for all components are comprehensive. Technical due diligence confirms the overall integrity of the technical design, including traffic safety, heavy vehicles parking space arrangements, traffic flow in and around the logistics park. The proposed Components 1-3 workflow is logical for cold-chain freight, vehicle imports, bonded freight operations and the site conditions<sup>17</sup>. The scale of planned construction is based on market demand survey of ZIH catchment areas. As such, it is found to be appropriate.

39. **Cost Estimate Accuracy.** Project costs in the final FSR are used for the Project appraisal. Based on experience, the difference between Investment Estimate and Bid Offer is within  $\pm 5-15\%$ .

**Table 3.** China Construction Costs Estimation Process

Stage	Contents
Investment Estimate	Final FSR Estimate
Budget of Preliminary Design	Based on preliminary design, the first draft of bills of quantity is prepared.
Budget of Construction Drawing	Based on detailed design / construction drawings, bills of quantity will be updated. This budget will serve as the basis for making the base bid and controlling price of bidding
Bid Offer	The price from the winning bidder
Construction Cost	The actual costs occurred for construction

40. **ZIH's Implementation Capacity.** ZIH capacity is considered adequate to implement the Project as it has proven track record in implementing projects with similar scales and complexity. In addition, technically Components 1–3 involve straightforward civil works of constructing warehouses, office buildings, supporting facilities and installation of relevant machineries/equipment. There were no significant technical challenges identified.

41. Technology is one of the competitive advantages of ZIH compared to its peers. Since 2013, ZIH has been investing in in-house research and development activities for its own logistics information platform. ZIH is supported by a capable IT department, who will oversee the implementation of Component 4.

42. **Timeline for Design and Construction.** ZIH has completed land acquisition and appointed design institutes for the detailed design of Component 1-3 using its own

<sup>17</sup> For example, land area, connectivity with the major roads, entry and exit.

financial resources. Construction is expected to start in 2022 until 2026. The main construction risk that could affect the timeline is unpredictable interruptions to the earthwork by the ZMG due to air quality concerns.

43. **Climate Change Risks and Opportunities.** Climate risk and vulnerability analysis identified medium climate risk due to exposure to flooding exacerbated by climate change. The risk will be mitigated by integrating a range of measures to increase flood retention capacity to better manage the storm water. This includes permeable paving, a roof storm-water collection and re-use system.

44. The Project will also contribute to GHG emission reductions by adopting energy efficient design in the cold storage facilities (Component 1) with the use of high GWP refrigerant significantly reduced. As a result, the energy consumption of the selected technical solution would be 40% lower than the national average with the reduced risk of leakage of high GWP refrigerant. The refrigerant used in this project is non-ODS (Ozone Depleting Substances) material. In addition, ZIH has agreed that the technical specification on the recommended refrigerant would be included in the tender documents. In addition, Components 1-3 will conform to the national and Henan provincial green building guidelines<sup>18</sup> and the Project would enable modal shift from road freight transportation to rail which is much less carbon intensive.

45. Overall, 41% of AIIB's financing would be considered as climate mitigation finance according to the joint MDB methodology on climate finance tracking.

## B. Economic and Financial Analysis

46. **Background.** The Project presents strong commercial features for promoting cross-border trade connectivity and improving efficiency, the Project Team has focused on: i) understanding the big picture of CR Express and ii) evaluating ZIH's strategic business planning. The Project Team analyzed the following:

- a. Based on the FSR, independently prepared a project-level economic analysis;
- b. Assessing the FSR project-level financial analysis and
- c. Independently prepared a long-term, high level cashflow forecast of ZIH at the corporate level.

47. **Economic Analysis.** The analysis covers 19 years from 2021 to 2039 including four years of construction. Different types of demand are identified: i) incremental demand and ii) non-incremental demand which includes existing demand and converted demand from maritime to railway. Economic benefits qualified for incremental demand includes: i) enlarged warehouse capacity with warehouse rental prevailing market price as the economic shadow price and ii) trade facilitation benefits due to lower prices of traded goods. Economic benefits qualified for non-incremental demand include savings from: i) transportation cost; ii) carbon emissions; iii) accident cost because of shorter

---

<sup>18</sup> Namely *Green Industrial Building Evaluation Criteria* GB/T50878-2013 and Henan Provincial Green Building Evaluation Criteria DBJ41/T109-2015.

distance to the warehouse and iv) carbon emissions savings and time savings from delays due to the conversion of maritime to railway transportation mode.

48. Project costs include capital and operations and maintenance (O&M) costs. A standard conversion factor of 1 is assumed to convert financial costs to economic costs for a conservative Economic Internal Rate of Return (EIRR).

49. **Economically Viability.** The EIRR is 18.4% and Net Present Value (NPV) is USD266 million (RMB1,688 million) at 8% social discount rate. Sensitivity analyses were also conducted considering reductions in costs and benefits, and all confirmed the robustness of the net economic benefits. The EIRR remained at or above 8% under all scenarios.

50. **Additional Benefits.** Rather than financing the trains directly, the project activities are to build supporting facilities to the CR Express operations. The expected project outcomes are, as stated in the Project Objectives and reflected in the results indicators, intensified trading activities and more balanced import/export structure, contributing to enhanced operational efficiency of CR Express.

51. The expected impact from this project, considered as additional benefits, include employment opportunities, logistics value chain integration, and agglomeration of industries around the logistics facilities. Those additional benefits of the CR Express hubs are supported by several empirical studies (on connectivity, trade, and economic growth) and readily recognized by many municipal governments in China.

52. However, a significant portion of those additional benefits are strongly associated with the train operations. Identifying and differentiating the additional benefits among the supporting facilities and the train operations would be technically challenging and likely to introduce additional uncertainty. As such, the economic analysis for the Project was conducted at the outcomes level, without accounting the additional benefits.

53. **Financial Analysis.** The Project mainly generates rental incomes, revenue from digital trading platform and custom handling fees. The Project-level financial analysis shows a Financial IRR of 6.47% with a positive cash contribution of circa. The Project Team has also performed a hypothetical NSBF analysis using the same capital structure of 60% debt and 15-year tenor debt with an assumed financing costs of 7.5% p.a. It was found that the annual debt service cover ratio is too low and would require onerous parent company support. It is concluded that NSBF is not the right instrument for the Project nor ZIH.

54. Based on a high-level ZIH cashflow projection (i.e., not at Project-level but at the parent-level), with the Project would bring forward ZIH commercialization by a few years. The “Without Project” scenario is used to set the SBF loan tenor of 15 years giving ZIH some additional buffer owing to the uncertainty of the cash flow projection.

55. **Operational Sustainability.** ZIH has operated existing facility since 2013 with a good track record of operational performance. The availability of government support is crucial for the near to medium term operational sustainability for ZIH. As CR Express provides additional economic benefits to Henan and Zhengzhou, both provincial and municipal governments have consistently been supporting ZIH development.



### C. Fiduciary and Governance

56. **Institutional Capacity.** An assessment has been carried out on the ZIH's knowledge and capability for planning, preparation, and implementation of the Project. No major issues have been identified other than technical documentation such as detailed designs are to be prepared.

57. **Procurement.** Based on the procurement assessment conducted, the Engineering Department of ZIH has been equipped with experienced and competent procurement and contract management staff who are familiar with local procurement laws and regulation, even though they lack procurement experience with projects financed by MDB.

58. To strengthen the procurement capacity of the ZIH, ZIH has employed a local procurement agent which has relative experience in implementation of Asian Development Bank financed projects, to provide procurement support and advice to ZIH<sup>19</sup>. AIB procurement specialist will provide continuous procurement training and support to the ZIH staff as well as the procurement agent to strengthen their procurement capacity during preparation and implementation of the project. It is concluded that ZIH has adequate capacity to management the procurement process and contract administration of the project.

59. Based on the procurement capacity and risks assessment, the project procurement risk is rated as "Medium", for which corresponding mitigation measures have been put in place to ensure the proper procurement compliance with AIB Procurement Policy provisions.

60. **Financial Management.** ZIH has been identified as the project implementation entity to conduct project financial management work. Key project financial staffs have been nominated in ZIH's financial team to form PMO of this project. Separate bank account will be opened for this project and separate project accounting profile will be established in the current computerized accounting software (User Friend NC) to maintain project financial records in accordance with Ministry of Finance (MOF) and Bank's requirement.

61. Through documents review and discussion, it was noted a series of internal control and reviewing procedures are in place to standardize the financial management practice and ensure properly usage of project funds.

62. The project Designated Account (DA) in loan currency will be opened and managed by Henan Provincial Department of Finance (HPDF). Following the on-lending arrangement, the disbursement application will be submitted by ZIH and the review will be processed through Zhengzhou Municipality Finance Bureau (ZMFB) to HPDF. Following general fiscal management, loan proceeds will be disbursed from DA in HPDF to ZMFB, then to ZIH and finally to the contractors. In addition to the general guidance

---

<sup>19</sup> The scope includes but not limited to advertising procurement notices; preparing tender documents; issuing amendment and clarifications to issued tender documents; preparing tender evaluation reports; issuing contract award notice; compiling contract agreements and facilitating complaint handling.

issued by MOF, HPDF will issue a specific instruction of disbursement and funds flow management for this project to guide ZIH and standardize the processing work.

63. As this is the first time for ZIH to implement an MDB financed project, AIIB has provided detail training and guidance to furnish them with necessary knowledge in fiduciary requirement and procedures. Additionally, both HPDF and ZMFB have extensive experience in managing similar operations, their review on withdrawal applications and managing DAs will mitigate fiduciary risk of misuse of funds.

64. **Counterpart funding.** ZIH has mobilized sufficient counterpart funds from various sources to support project implementation and make-due payments for the first year. For the remaining funds, ZIH is seeking other sources.

65. **Disbursements.** The loan proceeds will be disbursed in accordance with AIIB's loan disbursement instructions. All disbursement methods are available to accommodate the needs of the proposed Project, such as direct payment, advance payment, reimbursement, and special commitment. Under the advance method, DA will be maintained in a financial institution acceptable to AIIB, and the criteria for this are set out in the *Interim Disbursement Manual for Sovereign-backed Loans*. The advance method will be used to pay for eligible expenditures which will be reported to AIIB subsequently. The detailed disbursement arrangements will be agreed with the borrower and set out in the Disbursement Letter.

66. **Governance and Anti-corruption.** AIIB is committed to preventing fraud and corruption in the projects it finances. It places the highest priority on ensuring that projects AIIB finances are implemented in strict compliance with AIIB's Policy on Prohibited Practices (2016). Implementation will be monitored regularly by AIIB staff. AIIB reserves the right to investigate, directly or indirectly through its agents, any alleged corrupt, fraudulent, collusive, coercive, or obstructive practices, and misuse of resources and theft or coercive practices relating to the project and to take necessary measures to prevent and address any issues in a timely manner, as appropriate. Detailed requirements will be specified in the Loan Agreement and the Project tender documents. AIIB will monitor the work related to tender document preparation and tender/proposal evaluation under Bank financing.

67. **Reporting and Monitoring.** Implementation support will be provided by regular supervision missions twice a year during the project implementation stage.

#### **D. Environmental and Social**

68. **Environmental and Social Policy (ESP) (including Standards) and Categorization.** AIIB's ESP, including the Environment and Social Standards (ESS) and the Environmental and Social Exclusion List are applicable to the proposed project. ESS 1 (Environmental and Social Assessment and Management) and ESS 2 (Involuntary Resettlement) are applicable to the project. The Project has been screened and reviewed in accordance with the AIIB's ESP, and as a result, the Project has been assigned as Category B with adequate mitigation measures available for eliminating and reducing the environmental and social negative impacts, through good management.

69. **Instruments.** To streamline project preparation, the instruments for environmental and social management have been prepared separately. During project preparation, a Due Diligence Report on the Relocation of Resettlement (DDR) was prepared to verify the process of resettlement that had taken place in 2015 and a Social Impact Assessment (SIA)/Social Management Plan (SMP) was prepared to cover the entire project. With respect to environmental aspects, an Environmental Impact Assessment (EIA)/ EMP was prepared to cover all the proposed project components, in accordance with AIIB's ESP requirements.

70. **Environmental Aspects.** To meet AIIB ES requirements, ZIH prepared an EIA/EMP, by updating and expanding the existing EIAs, to adequately cover all proposed project activities. In addition to carrying out an impact and risk assessment, ZIH also identified mitigation measures, conducted public consultation and information disclosure, and prepared the related EMP with institutional arrangements, in line with the ESP.

71. The EIA considered and assessed the pre-construction, construction, and operation phases separately. The assessment results indicated that during the pre-construction phase environmental issues are very limited and are mostly associated with ensuring appropriate incorporation of mitigation measures into the project design (e.g., using CO<sub>2</sub>+R507 refrigerant<sup>20</sup> for cold storage as recommended by the EIA/EMP). Potential negative environmental impacts and risks during the construction phase are short-term and localized, and are associated with soil erosion, construction noise, fugitive dust, disruption of traffic and community services, and risks to worker health and safety. These can be effectively mitigated through good construction and health and safety management and measures implemented by the contractors. There will be standard procedures for the control and mitigation of emissions, such as dust, noise and wastewater discharges from the construction sites and work camps.

72. During the operating stages of the project, potential impacts are associated with noise emissions and exhaust gas emission, domestic wastewater, solid waste, and occupational health and safety risks to workers. These risks can be effectively mitigated through good operation of the facility equipment (e.g., deploying low-noise equipment), and implementation of health and safety practices (e.g., establishing work safety procedures and conducting routine health checks for workers).

73. An EMP has been prepared as part of the EIA, to ensure: i) implementation of identified mitigation and management measures to avoid, reduce, mitigate, and compensate for anticipated adverse environmental impacts; ii) implementation of monitoring and reporting against the performance indicators and iii) compliance with the China's relevant environmental laws, standards, and regulations and the AIIB's ESP. The EMP includes an environmental monitoring plan to monitor the environmental impacts of the project and assess the effectiveness of mitigation measures; and a capacity building and training program focused on health, safety, and environmental management. Organizational responsibilities and budgets are clearly identified for implementation, monitoring, and reporting in the EMP.

---

<sup>20</sup> It is not Ozone depleting substances in accordance with Montreal Protocol on the Protection of the Ozone Layer.

74. **Social Aspects.** The proposed project activities are in three urban blocks of ZETDZ, totaling about 600 mu (equivalent to 40 hectares) of land. Since all the land required for the project had been acquired by local government in 2015, and subsequently bought over by ZIH, no new land acquisition and resettlement is required under the project. A due diligence was carried out to verify the process of resettlement (2015) and it was found that the land acquisition and the resettlement had been carried out in accordance with the law, relevant policies including AIIB's ESP and to the satisfaction of the affected persons.

75. The proposed Project is expected to generate largely positive social benefits for the local population, including an increase in import and export trade volume by RMB3 billion, generate tax revenue of RMB1.3 billion, benefit 140 cities in 23 provinces in China, and more than 30 countries overseas. The SIA identifies some localized issues which would be addressed in the SMP, such as opportunities to employ more women and able-bodied vulnerable groups; improvement in labor and grievance management among contractors; and stakeholder engagement and E&S training for Project company staff. The SIA includes a SMP to mitigate the identified issues and the implementation will be aided by an independent agency, who will conduct concurrent monitoring and supervision.

76. **Gender Aspects.** In China, the transformation of the logistics sector has two key elements: extending value-added services and digitalization. Both trends are attracting more female talent and workforce to the sector. The Project is expected to generate 145 new jobs. According to ZIH's recruitment plan, it will fill 26 job vacancies for managerial or technical roles with women (versus 23 with men); and another 48 job vacancies for skilled labors with women (versus 48 with men).

77. **Occupational Health and Safety, Labor and Employment Conditions.** The PMO shall ensure that adequate health and safety measures are implemented for workers, and that the bidding documents include clauses relating to the management of health and safety requirements by contractors. The PMO shall also ensure that civil works contractors comply with applicable labor laws and regulations and adopt and enforce codes of conduct (including guidelines for resolution of Gender Based Violence) aiming to mitigate possible issues related to labor influx. The relevant information will be included in the EIA/EMP and SIA/SMP.

78. **Stakeholder Engagement, Consultation, and Information Disclosure.** Substantial consultations have been held during the preparation and after the disclosure of the EIA/EMP, SIA/SMP and DDR. Consultations will be continued during project implementation, keeping in mind the national guidelines on restrictions imposed due to the COVID-19 pandemic. The English and Chinese versions (including the executive summaries) of EIA/EMP, SIA/SMP and DDR have been posted on ZIH<sup>21</sup> and AIIB<sup>22</sup> websites with hard copies made available in the Project area.

79. **Project Grievance Redress Mechanism (GRM).** A multi-tier Project GRM will be established in accordance with the requirements of AIIB's ESP. Communities and

---

<sup>21</sup> <http://www.zzquojilugang.com/746/>

<sup>22</sup> <https://www.aiib.org/en/projects/details/2020/proposed/Zhengzhou-International-Logistics-Hub-Previously-Zhengzhou-International-Hub-Expansion.html>

individuals who believe that they are adversely affected by the Project will be able to submit complaints to the project-level GRM for their resolution. Locally appropriate public consultation and disclosure process will be used to disseminate information about the GRM. In addition, a commensurate mechanism will be made available at the contractor level to address workplace complaints and concerns.

80. **Bank’s Project-Affected People’s Mechanism (PPM).** The PPM has been established by the Bank to provide an opportunity for the independent and impartial review of submissions from Project-affected people who believe they have been or are likely to be adversely affected by the AIIB’s failure to implement its ESP in situations when their concerns cannot be addressed satisfactorily through the Project-level GRM or the processes of the Bank’s Management. Information on the PPM is available at: <https://www.aiib.org/en/policies-strategies/operational-policies/policy-on-the-project-affected-mechanism.html>

#### E. Risks and Mitigation Measures

81. The Project’s Risk Rating is “Medium” with no major unmitigated risks. Given that ZIH is an operating business, the main risks are revenue generation and competition from other operators. Risk assessment and mitigating measures are presented in Table 4.

**Table 4.** Summary of Risks and Mitigating Measures

<b>Risk Description</b>	<b>Assessment Ratings</b>	<b>Mitigation Measures</b>
<b>Competition Risk</b> ZIH may not gain the market share needed for cost effective operations, and may even lose some customers.	<b>High</b>	Government policy intervention to avoid unhealthy competition and building up ZIH as a brand name as a quality service provider.
<b>Revenue Risk</b> ZIH may not achieve commercial viability and reduction of government support reliance.	<b>Medium</b>	Commercial viability would be enhanced by revenue generated through the development of new value-adding services in line with market demand, such as cold storage and improving customer services through the use of integrated information systems.
<b>Procurement</b> Unfamiliarity with AIIB procurement policy as well as tendency to follow any local procurement laws and regulations may result in the procurement process deviation from the AIIB Procurement Policy requirements.	<b>Medium</b>	i) Strengthening procurement capacity by using services of a professional procurement agent, as well as construction supervision company to conduct contract administration; ii) Continuous training and support to the ZIH during implementation of the project procurement and iii) Necessary procurement support including prior review and timely guidance to ZIH procurement staff.
<b>Environmental and Social Risks</b> The environmental and social impacts of the proposed	<b>Medium</b>	Category B has been assigned for the Project. EIA/EMP, SIA/SMP and DDR has been prepared and public consultations, especially with project-affected people and stakeholders

<b>Risk Description</b>	<b>Assessment Ratings</b>	<b>Mitigation Measures</b>
project are localized, and the related impacts/risks brought by the project would be limited, not unprecedented.		have been carried out, complemented by the disclosure of environmental and social documents.
<b>Financial Management</b> Inexperienced staff unfamiliar with fiduciary requirement and procedures may expose risks of misuse or inefficient use of project funds.	<b>Medium</b>	The Project Team will provide continuous training, and the Henan Provincial Department of Finance and Zhengzhou Finance Bureau, who have extensive experience, will review and monitor ZIH's implementation, and will provide fiduciary assurance on proper usage of loan proceeds.
<b>Foreign Exchange</b> Revenue and operating cost are in RMB, but AIIB debt service is in EUR.	<b>Low</b>	ZIH has minor unmatched foreign currency costs. If EUR/RMB is adversely moved by 20%, AIIB debt service would increase by equivalent to 0.9% of ZIH annual operating costs.
<b>Construction Risks</b> Limited ability to deliver the physical work on time and on budget.	<b>Low</b>	Except weather-related risks, the construction of the project components is not particular specialized nor challenging.
<b>Operational Risk</b> ZIH may not have the capacity to integrate and operate existing and new facilities effectively and efficiently.	<b>Low</b>	ZIH has ample of experiences in operating the existing facility, and it has planned for the long time of the new facilities.
<b>Bonded Logistic Center</b> To qualify for Type B bonded warehouse requires permits from Custom & Excise.	<b>Low</b>	Strong provincial government support for including a Type-B bonded logistics center within ZIH to maximize the facility utilization.
<b>Overall Rating</b>	<b>Medium</b>	

### Annex 1: Results Monitoring Framework

<b>Project Objective:</b>	To facilitate cross-border trade by enhancing freight service efficiency of the containerized CR Express trains connecting Zhengzhou China to Europe and Central Asia.										
Indicators	Unit	Baseline 2020	Cumulative Target Values					End Target 2026	Frequency	Responsibility	
			YR1	YR2	YR3	YR4	YR5				
<b>Project Objective Indicators:</b>											
Cross-Border Trade	Container volume	TEU	180,400	188,600	196,800	205,000	221,400	237,800	295,200	Semiannually	ZIH
	Number of trains	Number	1,100	1,200	1,300	1,400	1,500	1,650	1,800	Semiannually	ZIH
Operational Efficiency	Annual average load factor – Inbound	%	80%	80%	80%	80%	82%	84%	90%	Semiannually	ZIH
	Return trip ratio	%	40%	40%	40%	40%	41%	42%	45%	Semiannually	ZIH

Note: Annual average load factor refers to the number of loaded containers p.a. divided by the total number of containers p.a. in the same year. Return trip ratio refers to the number of westbound trains over the total number of trains departed in the same year.

## Intermediate Results Indicators:

Indicators	Unit	Baseline 2020	Cumulative Target Values					Frequency	Responsibility	
			YR1	YR2	YR3	YR4	YR5			
<b>Intermediate Results Indicators:</b>										
Component 1: Multimodal Cold Storage Facilities	Cold storage capacity	ton	0	0	0	0	0	50,000	Annually	ZIH
Component 2: Parallel Vehicle Imports Facility	Area for vehicle imports facility	sqm	0	0	0	0	0	89,800	Annually	ZIH
Component 3: Bonded logistics center	Area of bonded logistics facilities	sqm	0	0	0	0	0	68,000	Annually	ZIH
Component 4: Multimodal Logistics Information Platform Upgrade	Quotation time	minute	55	55	55	55	55	15	Annually	ZIH
	Booking time	minute	30	30	30	30	30	15	Annually	ZIH
Jobs Creation	Total number of new jobs created	Number	0	0	0	0	0	145	Annually	ZIH
	Total number of female employees newly hired	Number	0	0	0	0	0	74	Annually	ZIH



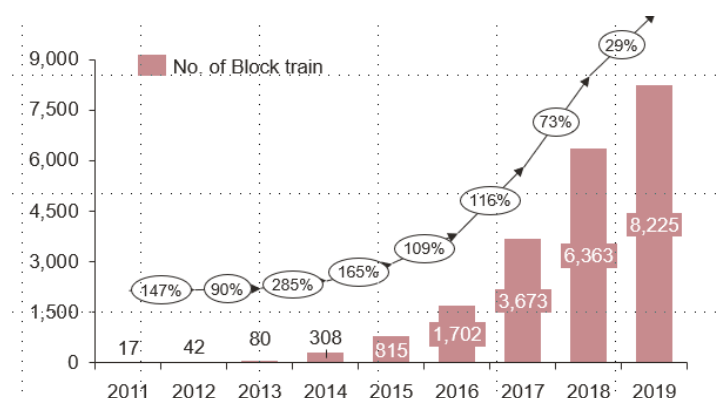
## Annex 2: Detailed Project Description

### A. Background

1. **CR Express.** It is an emerging and rapidly growing cross-border freight solution. CR Express provides containerized railway freight services with dedicated trains, routes and schedules connecting China to Central Asia and Europe. The first CR Express train departed from Chongqing to Duisburg, Germany on March 19, 2011. CR Express services offer reduced shipping time by two thirds, from 12-15 days compared to 40-45 days by maritime freight. In October 2017, the national railway companies of China, Belarus, Germany, Kazakhstan, Mongolia, Poland, and Russia set up a joint working group on CR Express. By the end of 2019, CR Express operates in 63 cities in China with a total of 8,225 trains carrying 725,000 TEU. Chengdu, Chongqing, Xi'an, Zhengzhou, and Wuhan accounted for 80% of the train business.

2. **COVID-19.** During the COVID-19 pandemic, freight cargo volume by CR Express resiliently increased amid shipping restrictions globally. From January to April 2020, there were 2,920 train trips carrying 262,000 TEUs, a 24% and 27% growth respectively compared to the same time-period in 2019<sup>1</sup>.

**Fig. B-1.** Total number of CR Express services.



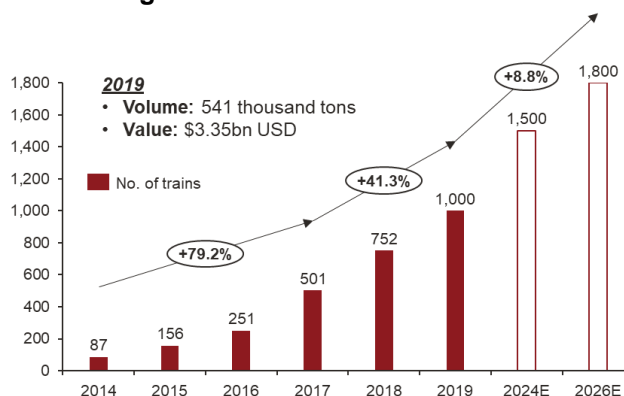
3. The city emphasizes developing four modalities of freight connectivity: i) air freight; ii) CR Express; iii) cross-border e-commerce; and iv) maritime silk road (the sea-rail intermodal freight). The city's location reinforces its position as one of China's consolidation freight cargo hubs with competitive handling costs and wide coverage for central and eastern China. Logistics operations generate spill-over effects to other business activities along the freight value chain and have attracted foreign direct investment.

4. ZIH has been selected as one of the national intermodal transport pilot projects for three consecutive years from 2017 to 2019. In 2020, National Development and Reform Commission (NDRC) provided support to implementing demonstration projects in 5 CR Express Consolidation Hub cities: Zhengzhou, Chongqing, Chengdu, Xi'an, and Urumqi. Following the historical trend, the Project has received strong support from MOF as well as endorsement at provincial and municipal government levels.

<sup>1</sup> [http://www.xinhuanet.com/silkroad/2020-05/18/c\\_1125997500.htm](http://www.xinhuanet.com/silkroad/2020-05/18/c_1125997500.htm)

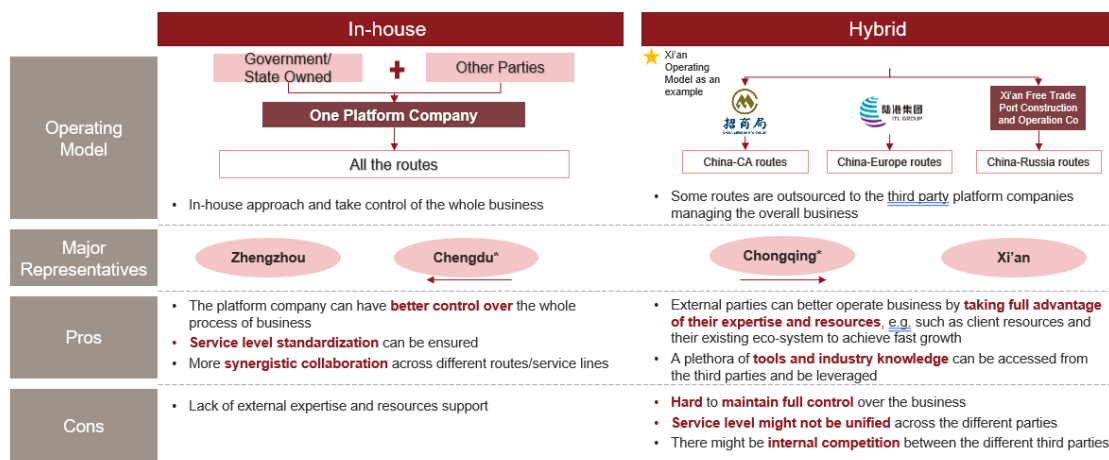
5. **ZIH.** As one of the pioneers, ZIH commenced its freight services in 2013 between Zhengzhou Railway Hub and Hamburg, Germany, passing through Mongolia, Russia, Belarus, and Poland. In 2015, the China Development Bank injected RMB100 million equity by subscribing preferential shares. Current shareholding structure is 47.1% with ZETDZ, 45.3% with HGMGC, and 7.6% with China Development Bank Fund.

**Fig. B-2.** ZIH Block Train Services.



6. ZIH’s business model leverages the advantage of its CR Express operation to develop its own brand name. This means it adopts an “in-house” approach integrating all business lines under one roof to achieve synergies across different business lines.

**Fig. B-3.** Business models of major CR Express Operator (AIIB’s own source).



\*Previously Chengdu operated using hybrid model, but transitioned to in-house model; Chongqing operated as in-house model, recently outsourced new south route to China Merchants Group

7. ZIH’s main business lines include: i) Operating the CR Express services from Zhengzhou; ii) Multi-modal freight forwarding services for international and domestic container cargos; iii) Trade business and e-commerce; iv) R&D for logistics information system and v) Construction and operation of logistics infrastructure. Cross-border trade and e-commerce is a promising area for ZIH’s further growth<sup>2</sup>. With its locational advantage, ZIH’s import trade business has been growing at the Compound Annual Growth Rate (CAGR) of 30% since its launch in 2016. Bonded warehouse would facilitate further the cross-border e-commerce business.

<sup>2</sup> Since 2017, China’s cross-border e-commerce has grown at the CAGR of over 50%. In 2019, the number of cross-border e-commerce users reaches 150 million.

8. A peer analysis was conducted covering Zhengzhou, Xi'an, Chongqing, and Chengdu. Currently Xi'an records the largest volume turnover due to strong government support and vast land area. However, ZIH is still advanced in high-quality value-added service and business extension, which brings advantages in CR Express commercialization process and improves resilience reducing the reliance on government support.

## B. Project Components Rationales

9. **Component 1 - Multimodal Cold Storage Facilities.** Among the goods transported by ZIH, cold chain logistics account for 5%. Henan is a large province of agricultural products and processed foods which creates a great demand for cold-chain logistics. With the opening of ASEAN routes, increases the amount of fruits and other goods imported every year and create further demand for cold chain logistics.

10. In 2019, the total value of the cold-chain cargo shipped by ZIH was USD106 million with a weight of 16,949 tons. At present, ZIH has only one temporary transfer point of 1,000 square meters, which can barely meet its international cold-chain goods storage demand. According to forecast, ZIH international and domestic cold chain goods volume will reach 26,078 tons and 16,559 tons respectively in 2024. Through the construction of the Project component, storage capacity would be increased by 50,000 tons<sup>3</sup>. When completed, it would contribute to the transformation and development of Henan cold-chain logistics industry<sup>4</sup>.

**Fig. B-4.** Schematic of Component 1



11. **Component 2 - Parallel Vehicle Imports Facility.** Currently most of the approved vehicle import ports in China are located along the coast and imported vehicles mainly depend on sea transportation. For provinces in central China including Henan, importing vehicles by sea will generate high transportation costs and take a long time. Compared to maritime, rail is an option with timesaving, reliability, and safety.

<sup>3</sup> The capacity is made up of 10,000 tons of refrigeration, 10,000 tons of freezing and 30,000 tons of adjustable cold chain storage.

<sup>4</sup> Relevant goods are meat, aquatic, dairy, vegetables, fruits, flowers, candy, electronics, raw materials, medicines, and other products under temperature control conditions.

12. In January 2018, eight ministries and commissions<sup>5</sup> jointly approved ZIH to carry out the pilot of vehicle importation, positioning the project as “Comprehensive International Automobile City Integrating Automobile Logistics, Commerce, Exhibition, and Service”. The component will serve six central China Provinces as a transit hub for vehicle import and export. It will drive the development of automobile industry in central China and generate agglomeration effect.

**Fig. B-5.** Schematic of Component 2



13. **Component 3 - Bonded Logistics Center.** This is a key missing function at ZIH. The component would further improve ZIH’s capacity to carry out multimodal freight business and allow “freight/trade integration” through longer duty exemption period. The Project component offers the following specific functions: bonded warehousing, international logistics distribution, simple processing and value-added services, de-consolidation and distribution, import and export trade and custom clearance.

**Fig. B-6.** Schematic of Component 3



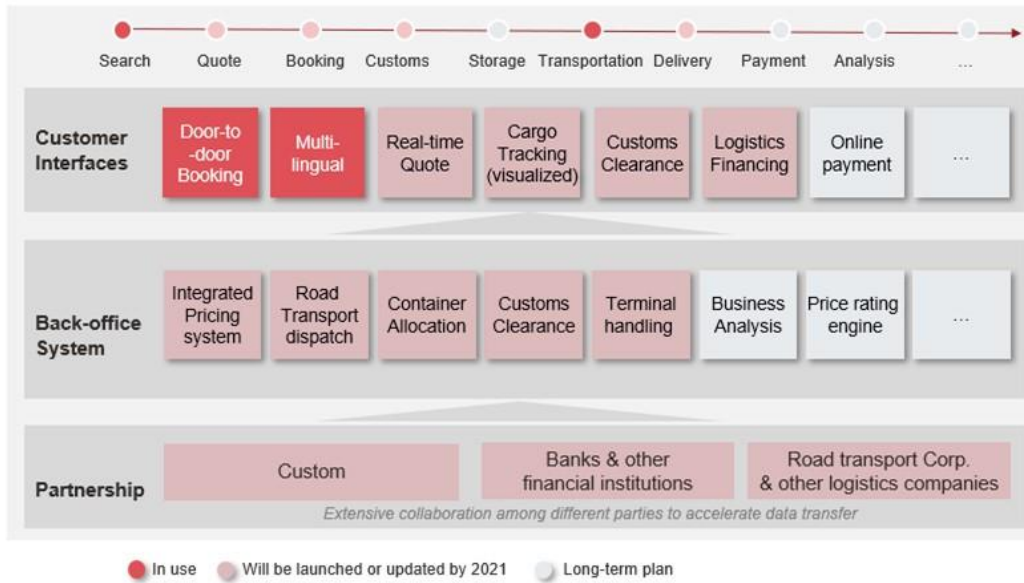
14. **Component 4 - Multimodal Logistics Information Platform Upgrade.** Since July 2015, the State Council issued the Guidance on Actively Promoting the “Internet+” and put forward 11 key actions such as “Highly Efficient Logistics with Internet+”. Since then digitalization, automation, and intelligent collection and storage in logistics industry have developed significantly.

---

<sup>5</sup> Ministry of Commerce, Ministry of Industry and Information Technology, Ministry of Public Security, Ministry of Environmental Protection, Ministry of Transport, General Administration of Customs, General Administration of Quality Supervision, Inspection and Quarantine, and National Certification and Accreditation Administration.

15. The deep integration of Internet of Things and logistics industry has changed the operation modality of traditional logistics from many aspects. ZIH has independently developed a comprehensive information platform according to its own development needs and service scope. As a result, greatly improves the freight efficiency of its CR Express operations reduces manpower and resources. This component further improves and optimizes related existing information platform functions. The overall technical architecture of the information system is shown below.

**Fig. B-7.** ZIH Information System Architecture.





### Annex 3: Detailed Economic Analysis

#### A. Introduction

1. A cost-benefit analysis was carried out to calculate the EIRR and NPV of the Project<sup>1</sup>. The analysis covers 19 years from 2021 to 2039 involving four years of construction and fifteen years of operation covering a sufficient time horizon.

#### B. Methodology and Key Assumptions

2. The economic analysis is based on comparisons of costs and benefits without-project and with-project scenarios. Costs and benefits are valued based on economic prices. A standard conversion factor of 1 is assumed to convert financial costs to economic costs for a conservative EIRR. The social discount rate used is 8 percent. The analysis is expressed in terms of EIRR and ENPV for the Project as a whole.

#### C. Estimating Economic Benefits

3. **Demand Types.** Different types are identified: i) new demand; ii) existing demand and iii) converted demand. New demand comprises the new users of the Project facilities. Existing demand consists of existing cold-chain users who will switch from their old and decentralized storage facilities to the newly facilities and Converted demand pertains those which will be converted from maritime to railway because of the Project. ZIH demands vis-à-vis other logistics hubs are based on market analysis conducted by the international consulting firm, in consultation with ZIH staffs as well as interviews with ZIH clients and logistics experts.

4. **Multimodal Cold Storage Facilities Demand.** Based on ZIH's designed warehouse capacity. Market analysis shows an occupancy rate for ZIH's cold chain storage picks up from 50% in 2025 to close-to-full capacity (95%) from 2031 onwards. Storage demand bound for international trade<sup>2</sup>, estimated to increase from 20% in 2025 to 40% in 2039, is distinguished between existing demand, converted demand from maritime to rail and new demand:

i) Existing demand is expected to have a 3% growth between 2025 and 2028 before zero growth, thereafter.

ii) Converted demand is estimated based on market analysis of CR Express's competitive advantage throughout the Project lifecycle. For example, the market share of CR express is projected to grow from 1.5% to 5.0% between 2025 and 2035 and the market growth rate of cold chain storage (10% year-on-year).

iii) New demand is the remaining volume of cold chain trade.

5. **Parallel Vehicle Imports Facility Demand.** Total demand is expected to solely come from demand converted from maritime to rail. Because the overall vehicle import market has been stagnant since 2015, no new demand is estimated.

---

<sup>1</sup> No specific economic evaluation is planned for the platform upgrade since it is assumed to contribute to the first three components mentioned. For example, better matching between supply and demand and better cargo information flows improves use of space in cold-chain facility and bonded warehouse.

<sup>2</sup> The remainder is domestic volume.

6. **Bonded Logistics Center Demand.** This is based on market analysis (i.e., a growing market) and benchmarking of ZIH with Chongqing, Chengdu and the national average. No existing demand is assumed, while converted demand is estimated based on market analysis of CR Express's competitive advantage and the market growth rate of bonded warehouse. Additional trade (representing new demand) is expected because of the construction of the bonded warehouse.

7. **Economic Benefits.** For new demand include: i) sales revenues from enlarged warehouse capacity and ii) trade facilitation benefits to consumers due to lower prices of traded goods. Economic benefits for existing and converted demand are captured by savings in domestic resource costs from replacing existing supply includes: i) transportation cost savings; ii) carbon emissions savings due to the conversion of transportation mode (i.e., from maritime to railway); iii) time savings from delays and iv) accident cost savings because of shorter distance to the warehouse. Other economic benefits are not quantified due to data limitations, such as employment and agglomeration benefits (i.e., upstream and downstream industries that can be created because of the Project)<sup>3</sup>.

**Table C-1.** Demand Sources and Benefits

Project component	Types of demand	Benefits
Cold chain storage	Existing demand	<ul style="list-style-type: none"> <li>• Transportation cost savings</li> <li>• Carbon emissions savings</li> <li>• Accident cost savings</li> </ul>
	Demand converted from maritime to railway	<ul style="list-style-type: none"> <li>• Carbon emissions savings</li> <li>• Time savings</li> </ul>
	New demand	<ul style="list-style-type: none"> <li>• Sales revenues from enlarged warehouse capacity</li> <li>• Trade facilitation benefits</li> </ul>
Parallel auto imports	Demand converted from maritime to railway	<ul style="list-style-type: none"> <li>• Carbon emissions savings</li> <li>• Time savings</li> </ul>
Bonded warehouse	Demand converted from maritime to railway	<ul style="list-style-type: none"> <li>• Carbon emissions savings</li> <li>• Time savings</li> </ul>
	New demand	<ul style="list-style-type: none"> <li>• Sales revenues from enlarged warehouse capacity</li> <li>• Trade facilitation benefits</li> </ul>

8. **Enlarged Warehouse Capacity.** The Project is expected to increase the capacity of cold-chain storage facility and bonded warehouse. The benefit derived from this capacity increase is calculated using the warehouse rental prevailing market price as the economic shadow price, multiplied by the estimated new demand. These sales revenues represent the new users' willingness to pay and capture the value-added of increased capacity<sup>4</sup>.

<sup>3</sup> The bonded warehouse provides customs duty exemption. However, such exemptions cannot be considered as an economic benefit since these are transfer payments.

<sup>4</sup> Logistics services is a necessary component of supply chains for products.

9. **Trade Facilitation Benefits.** Given increased logistics capacity (cold chain storage and bonded warehouse), the Project is expected to increase the volume of goods exports and imports due to cheaper prices. Since the Project may lower market prices of imported (or exported) goods, benefits to consumers could be captured by the difference between what consumers would pay for domestically sourced and the same from imports as a result of the Project.

10. **Transportation Cost Savings.** The Project is expected to provide transportation cost savings from shortened travel distance of loading goods instead of multiple cold chain storage locations for existing demand.

11. **Accident Cost Savings.** Because of shorter travel distance to the cold chain warehouses, fewer cases of accidents on the road are expected. The fatality rate for road transportation is about 2.7 deaths for  $10^8$  ton-kilometers. To calculate the savings, existing demand volume is multiplied by the fatality rate, average distance saved (20 kilometers).

12. **Carbon Emissions Savings.** Environmental benefits from reduced freight travel are expected in the form of carbon dioxide emissions savings. These savings are due to shortened travel distance of loading goods (for existing demand in the cold chain component) and conversion of transportation mode from maritime to rail (for all components). The social benefits from carbon emissions reduction are calculated using the shadow prices of carbon (e.g., USD46 per ton in 2025, USD60 per ton in 2039)<sup>5</sup>.

13. **Time Savings from Delays.** Converting transportation from maritime to railway can generate time savings. On average, there is an expected time savings of 15 days for every 360 days. For all components, converted demand is multiplied by the price of goods transported, the proportion of savings from delays (i.e. 15/360) and the minimum required annualized EIRR of 8%.

#### **D. Estimating Economic Costs**

14. The Project's financial costs include construction investment, working capital and O&M costs.

#### **E. Results of Economic Analysis and Sensitivity Analysis**

15. Based on available data and assumptions adopted in the base case, the Project is economically viable. The EIRR is 18.4 percent and NPV is USD 266 million (RMB1,688 million) at 8 percent social discount rate. The EIRR calculation (Table C-2) includes all the costs and benefits of all project components as described above. At an 8% social discount rate, the project is found to be economically viable with an NPV of USD 266 million (RMB1,688 million). The EIRR for the whole project is 18.4 %, which exceeds the threshold significantly.

---

<sup>5</sup> This is based on the World Bank's Guidance note on shadow price of carbon in economic analysis, November 12, 2017. Social benefits of emission reduction are conservative estimates since the lower price estimate was used.



**Table C-2. EIRR Calculation (RMB Million)**

	<b>Multimodal Cold Storage Facilities</b>	<b>Parallel Vehicle Imports Facility</b>	<b>Bonded Logistics Center</b>	<b>Total Benefits</b>	<b>Total Costs</b>	<b>Net Benefits</b>
2021	0.0	0.0	0.0	0.0	364.4	-364.4
2022	0.0	0.0	0.0	0.0	465.6	-465.6
2023	0.0	0.0	0.0	0.0	536.9	-536.9
2024	0.0	0.0	0.0	0.0	165.5	-165.5
2025	19.8	0.0	201.2	221.0	85.7	135.3
2026	36.4	14.6	269.4	320.4	94.1	226.3
2027	53.1	29.3	333.3	415.7	105.6	310.1
2028	69.5	29.3	404.7	503.5	104.6	398.9
2029	78.2	29.3	476.1	583.6	104.7	478.9
2030	96.1	29.3	544.8	670.2	104.7	565.5
2031	141.4	39.1	542.2	722.7	104.8	618.0
2032	154.3	39.2	539.6	733.1	104.8	628.3
2033	167.3	39.2	537.0	743.5	104.9	638.6
2034	167.3	39.2	534.4	740.9	104.9	636.0
2035	167.4	39.2	534.4	741.1	98.0	643.1
2036	167.5	39.2	534.5	741.2	98.2	643.0
2037	167.6	39.2	534.5	741.3	98.2	643.1
2038	167.6	39.3	534.6	741.5	98.3	643.2
2039	167.7	39.3	534.6	741.6	98.4	643.2
<b>NPV</b>	<b>1,688.3</b>					
<b>EIRR</b>	<b>18.4%</b>					

16. The Project is robust to negative impacts as shown by the results of the sensitivity tests (Tables C-3). Those tests include all cost overruns (20 percent increases), reductions in benefits (20 percentage decreases) and the combination of the two. The EIRR remained at or above the hurdle rate of 8 percent under all scenarios.

**Table C-3. Sensitivity Analysis**

	<b>EIRR</b>	<b>ENPV @ 8% USD Million</b>	<b>ENPV @ 8% RMB Million</b>
Base case	18.4%	266	1,688
Costs increase by 20%	15.3%	206	1305
Benefits decrease by 20%	14.6%	152	968
Combination of costs increase by 20% and benefits decrease by 20%	11.6%	92	584

## Annex 4: Detailed Financial Analysis

### A. Introduction

1. A financial analysis was carried out at two levels: i) Project-level to calculate the Financial IRR and free cashflow contribution to ZIH<sup>1</sup>. For this part of the analysis, AIIB reviewed the FSR results and ii) AIIB then projects on a high-level basis ZIH future cashflow with or without the Project. The point in which ZIH becomes fully commercialized is determined. The differences between the two scenarios represents the contributions of the Project towards ZIH commercialization.

### B. Project Level

2. **Assumption.** Each component has separate revenue streams. Component 1<sup>2</sup> generates two types of revenue: i) warehouse rents and ii) from digital trading platform. Component 2<sup>3</sup> and Component 3<sup>4</sup> generate four types of revenues: i) warehouse rents; ii) commercial zone rents; iii) container yard handling charges and iv) property management fees. Component 4<sup>5</sup> generates custom handling fee. The FSR revenue assumptions are based on local data.

3. There are two categories of costs: i) capital expenditures which is partially financed by AIIB and ii) operating costs comprise of: a) raw material; b) utility (water and electricity); c) staff salary and benefits; d) maintenance and e) management fee.

4. **Results.** The Financial IRR is 6.47%. After servicing AIIB loan, the Project would contribute a positive cashflow to ZIH towards its commercialization.

5. **SBF vs. NSBF.** To assess the possibility of securing NSBF financing, the Project Team has performed a hypothetical loan structuring analysis. Using on the current capital structure of circa. 60% debt with debt tenor of 15 years, a total financing cost of 7.5% p.a. is assumed. Under this scenario, the average annual debt service cover ratio is 1.46x which is on the lower range for full market risk.

6. This means if the Project is privately financed, without long-term underpinning, creditworthy offtaker, it would require onerous parent company support. This would add further financial burden to ZIH and to delay commercialization. As such, at the current phase of ZIH development, it would make sense for AIIB to provide a SBF.

7. **Sensitivity.** The following sensitivity were run to evaluate the robustness of the financial projections. In all cases, the Financial IRR is positive. The Project continues to make positive cash contribution to ZIH.

---

<sup>1</sup> It is important to note that this distinction is artificial for analysis purposes as there are no separate special purpose vehicles to house the Project.

<sup>2</sup> Multimodal Cold Storage Facilities.

<sup>3</sup> Parallel Vehicle Imports Facility.

<sup>4</sup> Bonded Logistics Center.

<sup>5</sup> Multimodal Logistics Information Platform Upgrade.

**Table D-1.** Sensitivity Analysis

	<b>Financial IRR</b>
Base case	6.47%
Capital Expenditure increase by 20%	4.54%
Revenue decreases by 20%	2.91%
Operating Costs increases by 10%	5.43%
Combination of above with increases and decreases by 10% correspondingly	3.28%

### **C. ZIH Corporate Level**

8. **ZIH Cashflow Projection.** ZIH is a startup business operates in a dynamic market with material uncertainty and sensitive to the global macroeconomic and regional political tension. As such, the Project Team has adopted a 'top-down' instead of a 'bottom-up' to project ZIH's long term cashflow. The objective of the analysis is to understand the contribution by the Project towards **ZIH commercialization**.

9. **ZIH** has two main revenue sources: CR Express and Import trading business. The Project free cashflow is supplementary.

10. **Results.** From the high-level modelling, the Project would bring commercialization forward by a few years. It is important to stress that predicting when ZIH would be commercialized is very challenging because it involves a number of factors which are neither included in the analyses nor capable of being accurately predicted. The most valuable insight gained is the relativity between with and without Project. Because of the uncertainty, when the Project Team structures the loan tenor, it was decided to include a buffer and set it to 15 years.

## Annex 5: Member and Sector Context

- 1. Infrastructure.** It remains a critical driver for supporting China and its population's transition towards a technology and consumption-driven economy. Since its economic reforms in the 1980s, China has enjoyed unprecedented economic growth, driven by labor-intensive growth model. Growth has been translated to income increase which drives domestic market expansion and demands for high-quality imported goods and services.
- 2.** To sustain further growth, the country is shifting towards technology. For example, cross-border e-commerce activities are growing. In 2018, total export value of cross-border e-commerce in China amounted to about USD214 billion, increasing from around USD79 billion in the previous year. The export value is estimated to reach USD293 billion in 2021<sup>1</sup>. These emerging trends would require further investments in infrastructure. Increasing import demand would require better logistics infrastructure such as, cold-chain logistics and storage for maintaining quality during shipment which benefit both traders and consumers.
- 3. Trade and Regional Economic Cooperation**<sup>2</sup>. China and the EU have an extensive economic relationship as EU has consistently been China's largest trading partner. In 2019, China's exports to the EU were around USD372 billion while its imports from the EU were about USD257 billion. Year-on-year trade growth is about 5.7% between 2015 and 2019.
- 4.** Other key markets for trade growth are neighboring emerging economies including Russia (there was a 12% year-on-year trade growth from 2015 to 2019 between China and Russia), Central Asia (9.5% growth) and ASEAN countries (8% growth). These trade relationships are made possible by existing cross-border connectivity infrastructure, such as the Duisburg Port which facilitate 30% of China-EU trade and the Trans-Siberian railway which facilitate China's trade with Russia and Central Asia.
- 5. Intermodal Freight Transportation.** It is core to building up cross-border connectivity. Intermodal freight uses multiple transportation modes (rail, ship, and truck) seamlessly. It has four key success attributes: transport links, transport nodes, containerization, and the provision of efficient services. Dry ports development located in deep inland areas, such as Zhengzhou played a major role in promoting intermodal transport. Dry ports incorporate customs, storage facilities, rail links and provisions for transfer, transshipment, and distribution functions. Local logistics companies develop information systems for improving intermodal operational efficiency.
- 6. CR Express Policy Setting.** China sets up clear policy agenda to develop CR Express as an effective means of developing and strengthening trade ties with Europe and Central Asia. The Planning for The Construction and Development CR Express 2016 – 2020 (the Plan) clarifies the spatial layout of three key CR Express corridors (East, Central, and West), hub locations, and rail routes. The Plan proposes to develop 43 operating lines considering major cargo origins, railway hubs, coastal ports, and border dry ports. CR, a state-owned enterprise, provides infrastructure, traction, wagons, and tariff policy. It also decides the number of freight trips operated in each city. CR coordinates with foreign national

---

<sup>1</sup> <https://www.statista.com/statistics/1106251/china-cross-border-ecommerce-retail-export-value/#:~:text=In%202018%2C%20the%20total%20export,billion%20U.S.%20dollars%20in%202021.>

<sup>2</sup> Figures in this paragraph are from Bank's analysis.

railway companies on the operational plan. The operator companies, majority of which are provincial and/or municipal level SOEs, operate the CR Express trains.

7. **CR Express Growth Analysis.** The European Union (EU) has been China's largest trading partner for the past 16 consecutive years. Notwithstanding geopolitics, China-EU bilateral trade is expected to grow steadily in the long term due to strong complementarity.

8. CR Express<sup>3</sup> currently only takes 1.3% of total China-EU trade transportation volume. More and more companies are in favor CR Express because of its time and costs competitiveness against sea and air, it is growing fast with CAGR 26%. As CR Express becomes more matured, industry experts' view expects its market share to reach 5%. Stable growth of traded commodities like electrical parts, automobile and related parts, machinery, clothing will create sustainable demand for CR express. In addition, booming demand in cold chain, cross-border e-commerce would further stimulate CR Express demand.

9. **CR Express Constrains.** After rapid growth of CR Express, infrastructure limitations and operational challenges emerge, causing delay and hindering future growth. Targeted improvement of certain infrastructural bottlenecks such as, port of Belarus–Malaszewicze (Belarusian–Polish border) and insufficient supply of rolling stocks<sup>4</sup> would increase the capacity remarkably. Besides, insufficient standardization, technical limitations and managerial issues also post bottlenecks to CR Express operations. If implementation of infrastructure upgrading plan, standardization, and digitalization can be realized, more than 4-fold capacity increase<sup>5</sup> is expected in next 10-20 years.

10. **CR Express Marketization.** CR Express has been growing rapidly in the past five years with operator companies competing along the same routes. In July 2020<sup>6</sup>, NDRC provided RMB200 million to support the implementation of demonstration projects for CR Express Consolidation Hub in 5 cities, namely Zhengzhou, Chongqing, Chengdu, Xi'an and Urumqi. These demonstration projects would transform CR Express operations from the disorderly "Point to Point" distributions to a "Hub and Spoke" network. With the hierarchical logistics network, it is expected the overall profitability as well as operational efficiency of the CR Express services would increase.

---

<sup>3</sup> Figures in this paragraph are from Bank's analysis.

<sup>4</sup> In 2020, the lack of rolling stocks in Kazakhstan & Russia caused block trains congestions and cancellation in Alataw, Horgos, Manchuria with passage soaring. Trans-Siberian Railway is almost overloaded with a limit of 2.5 m to 3 m TEU per year; the extreme weather posts another challenge.

<sup>5</sup> By international consultant's estimates, the 4-fold capacity enlargement is a conservative prediction. They have only considered the upgrade of existing, mature routes. With the development of new routes, more capacity can be achieved.

<sup>6</sup> [http://www.xinhuanet.com/local/2020-07/20/c\\_1126258921.htm](http://www.xinhuanet.com/local/2020-07/20/c_1126258921.htm)

## Annex 6: Sovereign Credit Fact Sheet

### A. Recent Economic Developments

1. China is an upper-middle-income country with income per capita of about USD10,400 and population of about 1.4 billion, as of 2019.<sup>1</sup> China has weathered the pandemic remarkably well. In 2020, economic growth remained positive as the country contained the virus outbreak, implemented an effective stimulus and reopened the economy ahead of others, benefiting from a booming export demand as other regions were still mired in the pandemic-related lockdowns, while global consumers switched consumption from services to manufactured goods. According to the National Bureau of Statistics (NBS), in Q1 2021, the economy grew by 18.3 percent, compared with Q1 2020, due to the base effect but also reflecting strong growth momentum.

2. Overall, China's economic growth has been trending down recently, declining from above 10 percent in 2010 to 6.0 percent in 2019.<sup>2</sup> This is related to the efforts to "rebalance" the economy more towards consumptions, which are showing some early results. On the demand side, before the pandemic, domestic consumption contributed 58 percent to the Gross Domestic Product (GDP) growth, as of 2019, according to the NBS. However, in the aftermath of the COVID-19 crisis, private consumption recovery has been lagging, which has led to concerns about sluggish household income and insufficient incentives to consume. On the supply side, services accounted for more than a half of 2020 GDP, whereas manufacturing for about 38 percent.<sup>3</sup>

3. Inflation in 2020 was stable, at 2.4 percent. Expansionary fiscal policy to support the economy through the pandemic and a carryover from the 2019 tax reforms led to a deterioration of the fiscal balance to a 11.4 percent of GDP deficit (International Monetary Fund's (IMF's) definition), while public debt increased to 44.7 percent of GDP.<sup>4</sup>

Selected Economic Indicators 1/	2017	2018	2019	2020	2021	2022
GDP growth 2/ 7/	6.9	6.7	6.0	2.3	8.4	5.6
Inflation 2/	1.6	2.1	2.9	2.4	1.2	1.9
Current account balance 2/	1.6	0.2	1.0	2.0	1.6	1.3
Fiscal balance 2/ 5/	-3.8	-4.7	-6.3	-11.4	-9.6	-8.7
Public debt 3/ 6/	36.2	36.5	38.1	44.7	47.2	49.5
External debt 3/	14.3	14.3	14.3	15.3	15.2	15.5
Gross official reserves (USD billions) 3/	3,236	3,168	3,223	3,579	3,842	4,127
Exchange rate (RMB/USD, end of period) 4/	6.53	6.86	6.98	6.52	6.38	..

Notes: 1/ in percent of GDP, except growth rates which are in percentage changes, average year-on-year; or as indicated otherwise; 2017-20 are actuals (or estimates), 2021-22 are projections, unless noted otherwise

2/ Source is IMF World Economic Outlook April 2021; 3/ Source is IMF Country Report No. 2021/006; 4/ Source is State Administration of Foreign Exchange, for 2021: as of June 2, 2021; 5/ General budgetary balance (IMF definition), measured by net lending/borrowing; 6/ General budgetary debt (official definition); 7/ Actuals for 2017-20 from National Bureau of Statistics database.

<sup>1</sup> Income classification and data from the World Bank.

<sup>2</sup> See the table for figures. This applies to all other numbers in the document if the source is not specified.

<sup>3</sup> National Bureau of Statistics.

<sup>4</sup> Fiscal balance as measured by net lending/borrowing using IMF's definition, which is based on official statistics, but broadens the fiscal coverage to include all four independent components of China's fiscal accounts, namely: general public budget, government funds, SOE budget, and social security (see IMF Country Report No. 2021/006, for more details). On the other hand, according to the narrower official budgetary approach (which includes only general public revenue and expenditure, adjusted for transfers) the deficit was 3.7 percent of GDP. Public debt measured by the general budgetary debt (official definition).

4. The current account has been broadly stable. It increased to a surplus of 1 percent of GDP in 2019 due to a decline in imports and a reduction in the primary income deficit. In 2020, current account surplus is likely to have increased further, to around 2 percent of GDP, due to lower commodity prices, the collapse in outbound tourism expenditure, and an unexpected surge of demand for Chinese exports, including pandemic-related goods.

5. Foreign direct investment into China reached record high levels in 2020, making China the biggest FDI destination in the world. Trade surplus combined with strong capital inflows led to a fast exchange rate appreciation. Since early 2020 the RMB has appreciated from around 7.0 to below 6.4 per USD, as of June 2021, which has raised some concerns among policymakers. International reserves have been broadly stable or growing. According to the IMF, reserves are estimated to cover about 16 months of imports, as of 2020, which is more than adequate.

## **B. Economic Outlook**

6. According to IMF projections, China's GDP growth is expected to rebound to 8.4 percent in 2021. In the longer term, the GDP growth rate should continue the smooth and gradual downward trend, along the rebalancing policy. Meanwhile, the pandemic has also revealed risks in the economy, including lagging private consumption, rising financial vulnerabilities as debts have climbed up, and the still uncertain external environment.

7. Regarding external environment, there have been positive signs recently, including the signing of EU-China Comprehensive Agreement as well as the Regional Comprehensive Economic Partnership. However, uncertainty remains about potential further escalation in trade and geo-political tensions that could lead to higher tariffs and supply chain disruptions. Continued technology decoupling could potentially add to risks.

8. On the domestic side, there are concerns about increasing financial stability risks related to rising vulnerabilities in the nonfinancial corporate sector (e.g., a significantly increase in debt), the highly leveraged property sector, the likely deterioration of credit quality in the banking sector and about the delay of further progress on financial de-risking.

9. Risks to debt sustainability are relatively contained, as economic growth is robust while debt levels remain manageable. External debt is projected to remain stable in the medium term, at around 15 percent of GDP. As the budget deficit is expected to remain higher than before the pandemic, public debt may continue increasing gradually, to almost 50 percent of GDP in the near term.

10. However, off-budget public investment activities are a source of risk. According to IMF's "augmented" debt definition—that is, including debt of local government financing vehicles likely to be recognized, which amount to almost 40 percent of GDP—public debt in 2020 increased from 80.5 to 91.7 percent of GDP, and is expected to rise further to over 110 percent of GDP in 2025.<sup>5</sup>

---

<sup>5</sup> See IMF Country Report No. 2021/006 for more discussion on the "augmented debt" and the related risks.

11. Still, China's sovereign credit remains strong, at A+/A1 with a stable outlook. This is thanks to the large and diversified economy, positive growth prospects, high degree of government's control over the financial sector (and the economy in general), as well as to debts being almost entirely in the local currency, refinanced at low costs. China's future debt profile will depend on continued economic growth, implementation of fiscal consolidation measures and on the gradual reduction of off-budget activities.