FINANCIAL ANALYSIS

A. Introduction

1. The Air Quality Improvement in the Greater Beijing–Tianjin–Hebei (BTH) Region—Henan Cleaner Fuel Switch Investment Program is the fifth in a set of multiyear projects by the Asian Development Bank (ADB) that seek to support air quality improvement in the greater BTH Region. The project will invest in clean fuel distribution (natural gas and biogas) that will replace coal and liquified petroleum gas (LPG) consumption in houses, businesses, and industry.

2. The Henan Cleaner Fuel Switch Investment Program supports the Government's objectives, as outlined in the Three-Year Action Plan to Win Blue Sky War (2018–2020), issued in June 2018. The Action Plan includes policy actions to accelerate (i) closing of heavily polluting industries, (ii) reducing surplus production capacity in industries, (iii) shifting to less air polluting transportation modes, and (iv) building cleaner and less air polluting energy systems to reduce air pollutant emissions by more than 15% for nitrogen oxide (NOx), sulfur dioxide (SO_2), and more than 18% for particulate matter less than 2.5 micrometer in diameter ($PM_{2.5}$) by 2020 as compared with the emissions level in 2015. In 2018, the provincial government also issued the Three-Year Action Plan for Henan Province to Combat Blue Sky War (2018–2020), which targeted to (i) reduce $PM_{2.5}$ to 58 micrograms per cubic meter (μg/m^3) by 2020, and (ii) achieve 35 μg/m^3 of the national air quality category II standard by 2023.

3. The project's financial analysis was carried out in accordance with the Financial Due Diligence Guidelines of the Asian Development Bank (2009). The results-based lending (RBL) program, namely BTH Henan Clean Fuel Switch Investment Program, consists of two components: (i) coal to gas switch in rural areas of Henan province, and (ii) biomass gas production plants. The RBL program will help address the province's overdependence on coal by financing a medium- and low-pressure gas distribution pipeline to 1.2 million households in Henan, as well as to businesses and industry. The network will transport 406 million normal cubic meter (Nm^3) of natural gas to end users by 2025. The program will also finance construction of a biogas facility that will produce 17 million Nm^3 of biogas and help supplement farmers' income. An awareness raising program will be implemented on cleaner fuel use and safety.

4. The executing agency is the Government of Henan Province, which will have overall responsibility for the program. The Zhongyuan Yuzi Investment Holding Group (ZYIG) and its subsidiary, the Henan Yu-Tian New Energy Co. Ltd. (YTNE) are the implementing agencies, which are responsible for implementing and monitoring the activities in the program. YTNE is a joint venture project company having been established by ZYIG and the China Tian Lun Gas Holding Limited (CTLG).[1]

B. Methodology and Major Assumptions

5. Financial viability is assessed by comparing the weighted average cost of capital (WACC) with the financial internal rate of return (FIRR) for the aggregate investment. The FIRR's sensitivity to adverse changes in various cost and revenue assumptions is also assessed. The project capital costs include the costs to build the gas network, including medium- and low-pressure pipelines, regulatory stations, and storage facilities; land acquisition; the biogas storage facility; institutional

[1] YTNE has been established as a special purpose vehicle to undertake the program, with 60% equity provided through ZYIG and 40% by CTLG.

capacity building and training, including a public awareness campaign; administrative costs; interest during construction; and contingencies. The operation and maintenance (O&M) cost includes fuel for the biogas facility, gas transmission charges, utility (power and water) costs, staff wages, management costs, and financial charges. Asset depreciation is calculated on a straight line basis, applied to the capital assets as they are being built out. Income tax is calculated at 25%. Value added tax (VAT) is applied at 9%, and additional business surcharges (construction and maintenance tax, education surcharge, and local taxes) are calculated at 10% of VAT. The financial evaluation is based on the assets' economic life of 30 years.

C. Calculation of Financial Internal Rate of Return

6. To derive the project's FIRR, annual incremental cash flows over the project's life of 20 years were calculated. The FIRR was computed on an after-tax basis in real terms—2019 prices without adjustment for inflation. The FIRR was compared with the WACC. The WACC for the project is estimated at 1.57% in real terms (3.36% in nominal terms), as calculated in **Table 1** below.

Table 1: Weighted Average Cost of Capital in Real and Nominal Terms

Particulars	**Amount** (€ million)	**Weighting** (%)	**Nominal Cost** (%)	**Tax Rate** (%)	**Tax Adjusted Nominal Cost** (%)	**Inflation Rate** (%)	**Real Cost** (%)	**WACC** (%)
ADB Loan	269.0	48.3	0.83	25.00	0.62	1.56	-0.92	-0.45
Domestic loan	185.2	33.3	4.90	25.00	3.68	1.94	1.70	0.57
Equity	102.4	18.4	10.00	0.00	10.00	1.94	7.91	1.45
Total	**556.6**	**100.0**						**1.57**

ADB = Asian Development Bank, WACC = weighted average of cost of capital.
Source: Asian Development Bank estimates.

7. The project's FIRR is 7.17% on an after-tax basis in real terms. These rates compare favorably with the estimated WACC, substantiating the project's financial viability.

D. Sensitivity Analysis

8. The stress test assesses the sensitivity of the FIRR to (i) a 10% increase in capital costs, (ii) a 10% increase in non-fuel operating costs,[2] and (iii) a 5% reduction in natural gas demand.[3] The results of the sensitivity analysis are shown in **Table 2**. The sensitivity analysis shows all FIRR results exceeding the WACC (2.25%). These results substantiate the project's financial viability. The FIRR is most sensitive to a 10% increase in operating costs.

Table 2: Sensitivity Analysis

Scenario	**Real FIRR** (%)
Capital costs increase 10%	6.30
Operating costs increase 10%	6.60
Natural gas demand decrease 5%	6.98
Construction delay	6.28

FIRR = financial internal rate of return.

[2] The National Development and Reform Commission of China has historically protected wholesale gas purchasers like YTNE from large fluctuations in gas commodity costs but allowed for modest pass-through of fluctuations to end-users. Gas purchase costs are therefore essentially pass-through costs and are treated as such in the financial analysis.

[3] A 5% sensitivity rather than a 10% sensitivity was chosen because natural gas demand has historically grown roughly at 20% per annum in Henan and is forecast to continue to be strong because of government policy and customer preference for cleaner fuels.

Source: Asian Development Bank estimates.

E. Financial Performance of ZYIG and YTNE

9. **ZYIG financial performance**. Since ZYIG is the majority shareholder of YTNE, the overall program expenditure framework should depend on the ZYIG financial support for YTNE, especially during and after the RBL program. ZYIG's financial position has been robust and sound. As of June 2019, the credit rating of ZYIG is AAA as granted by major domestic rating agencies, A3 by Moody's and A- by Fitch. As of December 2018, it has total assets of CNY267 billion (€33.95 billion equivalent), net asset of CNY80 billion, sales revenue of CNY2,109 million and CNY260 million of net profit. It also holds about CNY16 billion of cash and equivalent. This cash-rich position is imperative to serve the debts to serve the debts and be ready for new capital expenditures. During 2015–2018, ZYIG experienced a period of high growth of asset scale and sales revenue. Total assets value increased from CNY108 billion in 2014 to CNY267 billion in 2018 with annual average growth rate of 26.4%. Its sales increased from CNY425 million in 2014 to CNY2,109 million in 2018 with annual average growth rate of 52.1%. The total owner's equity steadily expanded from CNY47 billion in 2014 to CNY80 billion in 2018, mainly due to continual capital injection from the Henan provincial government. While its debt scale simultaneously increased, debt solvency capacity is well maintained. Its debt service coverage ratio is always above 1.0, indicating 1.71 in 2017 and 1.24 in 2018. Its net profit margin has been maintained relatively high, indicating ZYIG has a stable profit-making capability. Key financial performance indexes of ZYIG's past financial performance, based on its audited financial statements from 2015–2018, are summarized in **Table 3** below.

Table 3: ZYIG Historical Financial Performance (2014–2018)

Items	2014	2015	2016	2017	2018
Sales Revenue (CNY million)	425	697	1,345	1,530	2,109
EBITDA (CNY million)	380	311	632	801	1,224
Net Income (CNY million)	**176**	**119**	**196**	**261**	**260**
Current Assets (CNY million)	7,468	12,683	17,420	31,694	36,676
Account Receivables (CNY million)	48	60	26	164	188
Non-current Assets (CNY million)	100,947	152,798	194,602	218,279	230,501
Total Assets (CNY million)	**108,415**	**165,480**	**212,022**	**249,973**	**267,177**
Current Liabilities (CNY million)	7,548	8,729	15,396	20,776	23,283
Long-term Liabilities (CNY million)	53,506	101,270	133,872	156,043	164,119
Shareholder Equity (CNY million)	47,362	55,481	62,754	73,155	79,775
Total liabilities and equity (CNY million)	**108,415**	**165,480**	**212,022**	**249,973**	**267,177**
Debt to Equity Ratio	55:45	65:35	69:31	69:31	68:32
Receivables Collection (months)	1.4	1.0	0.2	1.3	1.1
Current Ratio	1.0	1.5	1.1	1.5	1.6
Debt Service Coverage Ratio	2.5	1.7	1.1	1.7	1.2

EBITDA = Earnings before interest, taxes, depreciation, and amortization.
Source: Zhongyuan Yuzi Investment Holding Group.

10. ZYIG's financial outlook is assessed as positive. It is expected that the sales will further increase but with a smaller growth rate, and its profit margins will improve once the recent large-scale investment has been completed. ZYIG experienced fast growth in the past several years, but ZYIG forecasts to slow down its growth in the coming years. In the financial projection, therefore, it is assumed that debt borrowing scale will decline by 5% annually and equity financing will decline by 3% annually. Nevertheless, ZYIG's financial projection for the next 8 years indicates the healthy performance to maintain a minimum debt service coverage ratio of 1.2 and a maximum debt to equity ratio of 75:25 as covenanted in the draft loan and project agreements. Because the Government of the PRC has endorsed their application for ADB's loan, other local

financial institutions have also expressed interest in providing domestic financing. The PRC's National Development and Reform Commission has also authorized additional issuance of 15 billion domestic bonds to support ZYIG's entire investment activities. ZYIG's financial performance is projected in **Table 4**.

Table 4: ZYIG Projected Financial Performance (2019–2027)

Items	2019	2021	2023	2025	2027
Sales Revenue (CNY million)	2,372	2,713	2,782	2,751	2,657
EBITDA (CNY million)	1,649	1,884	2,204	2,372	2,462
Net Income (CNY million)	**638**	**658**	**694**	**685**	**649**
Current Assets (CNY million)	37,555	28,938	30,987	35,100	40,363
Non-current Assets (CNY million)	239,898	286,202	291,001	288,591	281,845
Total Assets (CNY million)	**277,453**	**315,140**	**321,988**	**323,691**	**322,208**
Current Liabilities (CNY million)	23,906	24,973	25,835	26,749	27,720
Long-term Liabilities (CNY million)	169,818	195,889	193,839	186,995	177,343
Shareholder Equity (CNY million)	83,729	94,278	102,314	109,946	117,145
Total liabilities and equity (CNY million)	**277,453**	**315,140**	**321,988**	**323,691**	**322,208**
Debt to Equity Ratio	68:32	67:33	65:35	63:37	60: 40
Receivables Collection (months)	1.2	1.0	0.2	1.3	1.1
Current Ratio	1.6	1.2	1.2	1.3	1.5
Debt Service Coverage Ratio	1.2	1.2	1.3	1.3	1.3

EBITDA = Earnings before interest, taxes, depreciation, and amortization.
Sources: Asian Development Bank, and Zhongyuan Yuzi Investment Holding Group estimates.

11. The private development partner, CTLG, is also financially sound. It is a listed company in the Hong Kong exchange market. As of end of 2018, it has total assets of CNY11.4 billion, net assets of 3.5 billion, annual sales of CNY5.1 billion and net profit of CNY600 million. Both public and private shareholders of YTNE are large companies capable of providing the required additional capital and financial support to YTNE. In the draft loan and project agreements, the Henan Provincial Government and ZYIG are required to cause YTNE to meet any financial requirements for its investments in the RBL program. Based on such a strong commitment for the funding plan, the broader program expenditure framework following the RBL program is considered sustainable.

12. **YTNE financial performance.** While YTNE was established in 2018, it completed a pilot clean fuel switch subproject from coal to gas in scale of more than 0.3 million households in 2018. Once the gas supply to households is made along with construction of gas pipeline expansion, a market risk is deemed to be low because of strong demand for natural gas by the households, and because of YTNE's monopoly position as authorized in the designated districts where the pipeline network is located.[4] As per the regulation, YTNE has the right to apply for gas sales price adjustment from local authorities on a regular basis if its gas procurement cost increases substantially. Wholesale gas prices are also regulated by the Government of the PRC, which historically has protected wholesale gas purchasers like YTNE from large price fluctuations. The prospect of increasing competition in gas supply in China—driven by government policy—is also likely to provide protections against large price spikes of gas purchases. YTNE is also accessible to an umbrella of gas supply contracts of CTLG, who is YTNE's private shareholder as well as management operator.

13. YTNE's financial outlook is dependent on timely implementation of subprojects under the RBL program. This risk is also viewed as low because YTNE's construction management can

[4] Natural gas demand has historically grown roughly by 20% per annum in Henan and is forecast to continue to be strong because of government policy and customer preference for cleaner fuels.

depend on assistance from its cooperation partner CTLG, which has been engaged in natural gas business for more than 15 years and accumulated rich technical and management experience. Consequently, the related operational risk is expected to be low through the long-term partnershipbetween YTNE and CTLG which has demonstrated the private operator's commercial ability to hit sales targets while controlling costs in a natural gas business in 60 cities of 17 provinces in the country. YTNE will further deal with a subproject default risk by requiring customers connected under the RBL program to buy pre-paid integrated circuit cards for gas supply. Sales revenue from gas supply to customers will therefore mostly be controlled and collected in advance by IC cards; the revenue collection risk is considered small in business.

14. YTNE's financial data were projected for 2019–2027. It indicates that YTNE will maintain a sustainable financial position in terms of the minimum debt service coverage ratio of 1.2, and the maximum debt to equity ratio of 70:30 as covenanted in the draft loan and project agreements. While YTNE is a new company, it will strengthen its credit capacity to borrow from financial institutions, using the additional subproject assets at mortgage, and the inter-company borrowing and/or financial guarantee from ZYIG.[5] YTNE's financial performance including the 2018 actual position and the afterward projection is indicated in **Table 5**.

Table 5: YTNE Financial Performance (2018–2027)

	Actual	**Projected**				
Items	**2018**	**2019**	**2021**	**2023**	**2025**	**2027**
Sales Revenue (CNY million)	7	267	1,147	2,166	3,108	4,072
EBITDA (CNY million)	7	132	544	990	1,368	1,772
Net Income (CNY million)	**0**	**53**	**250**	**447**	**550**	**729**
Current Assets (CNY million)	15	139	815	1,636	3,008	4,349
Account Receivables (CNY million)	-	22	96	181	259	339
Non-current Assets (CNY million)	929	2,404	5,041	7,342	9,695	10,938
Total Assets (CNY million)	**944**	**2,543**	**5,856**	**8,977**	**12,702**	**15,288**
Current Liabilities (CNY million)	943	980	864	676	862	923
Long-term Liabilities (CNY million)	-	475	1,885	4,275	6,458	7,215
Shareholder Equity (CNY million)	1	1,088	3,106	4,027	5,383	7,150
Total liabilities and equity (CNY million)	**944**	**2,543**	**5,856**	**8,977**	**12,702**	**15,288**
Debt to Equity Ratio	991	51:49	42:58	52:48	55:45	51:49
Current Ratio	0.02	0.14	0.94	2.42	3.49	4.71
Debt Service Coverage Ratio	19.50	1.77	1.71	3.59	2.40	1.94

EBIDA = Earnings before interest, depreciation, amortization and tax.
Sources: Asian Development Bank, and Zhongyuan Yuzi Investment Holding Group estimates.

[5] During YTNE's startup, the current ratios are projected below 1.0, since most of investments are in fixed assets instead of the current assets while the current liabilities are higher in the forms of bridge loans and account payables. The current ratios are projected to be much higher than 1.0 from 2022 afterwards.