Transition Finance | Case Study 10: Osaka Gas Co., Ltd.

Case Study Overview

■ Corporate Profile

Industry	Gas
Location	Japan
Business	Japan's major gas company. The company operates in domestic energy, international energy, and life & business solutions businesses.

■ Bond Outline

Planned issue date	• May 2022
Planned issue amount	• Approximately 10 billion yen
Evaluation agency	• DNV Business Assurance Japan Co., Ltd.

3rd Party Evaluation

- Confirmed that Osaka Gas' transition strategy is a plan with mid-term and long-term goals, and that the plan is based on scientific evidence consistent with the gas sector technology roadmap and the power sector roadmap.
- Also confirmed that the transition strategy is closely linked to the environmental materiality of Osaka Gas and will promote the transformation of its core business. In addition, we confirmed that the company will contribute to the decarbonization of society as a whole by transforming into an integrated energy company through expansion into new business areas.
- We commend the establishment of quantified mid-term & long-term targets and the establishment and disclosure of mid-term targets not only for reduction contributions but also for part of Scope 3 in order to promote efforts to address Scope 3.
- Confirmed that Osaka Gas discloses short- and medium-term investment plans for investments, including transitions, by 2030. Also confirmed that environmental improvement effects would be quantified and disclosed.
- Ensured that just transition is also considered as the transition strategy is implemented.

Major Use of Proceeds

Use of Funds Category		Major Projects
Decarbonization of gas energy	Hydrogen utilization	• Methanation (SOEC co-electrolysis), direct use (chemical looping combustion technology), etc.
	Biogas	• On-site utilization in domestic/global scale
Decarbonization of power generation	Renewable power generation	• **Solar power plants, onshore wind farm,** offshore wind farm, biomass power plants, etc.
	Thermal power generation	• Use of carbon neutral fuels such as synthetic methane, hydrogen and ammonia, CCUS (Carbon Capture, Utilization and Storage), etc.
Low-carbonization	Fuel Cell	• Enhancing efficiency and downsizing, etc.
	Advanced utilization of natural gas and CHP	• **Support for converting fuel from oil and coal to natural gas** • Demonstration of building micro grid, etc.
	Advanced energy use	• VPP, smart energy systems, etc.
	Other (Reduction of CO2 emission associated with own activities)	• Cryogenic power generation in the city gas production process, cryogenic power generation facilities • Energy efficiency renovation work of buildings, etc.

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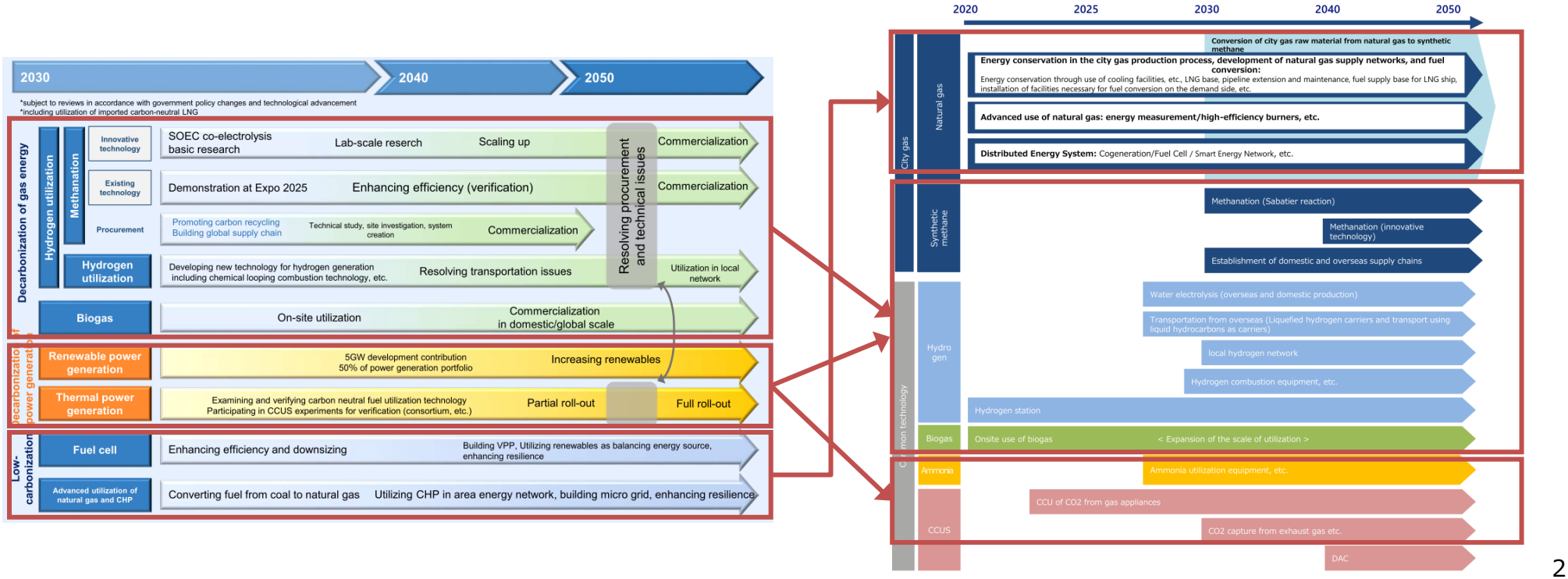
Alignment with the Four Elements in Basic Guidelines on Climate Transition Finance

Element 1 (Transition Strategy and Governance)	• Transition Strategy: Formulated the roadmap to achieve CN in 2050, outlining the path to achieve CN through decarbonization of gaseous energy by methanation, etc., decarbonization of power sources, and low-carbonization by natural gas. • Governance: Established a governance structure to promote the execution of the transition strategy at the management level.
Element 2 (Materiality)	• "Realization of a low-carbon/decarbonized society" is positioned as one of the most important management issues (materiality).
Element 3 (Science based Targets & Pathways)	• Set mid-term targets for Scope 1, 2 and part of Scope 3 toward net zero CO2 emissions by 2050. • The low-carbon and decarbonization efforts to achieve this goal are aligned with the roadmap for the gas and electricity sectors by METI.
Element 4 (Transparency)	• Plans to invest a cumulative total of 2 trillion yen from FY2017 to FY2030 as quality improvement investments and growth investments and M&A, including transition strategy execution. (737 billion yen is planned for FY2021~2023) • Annual reporting on the appropriation of procured funds and environmental improvement effects. Reporting of environmental improvement effects will be "up to the reimbursement period," which exceeds standard requirements.

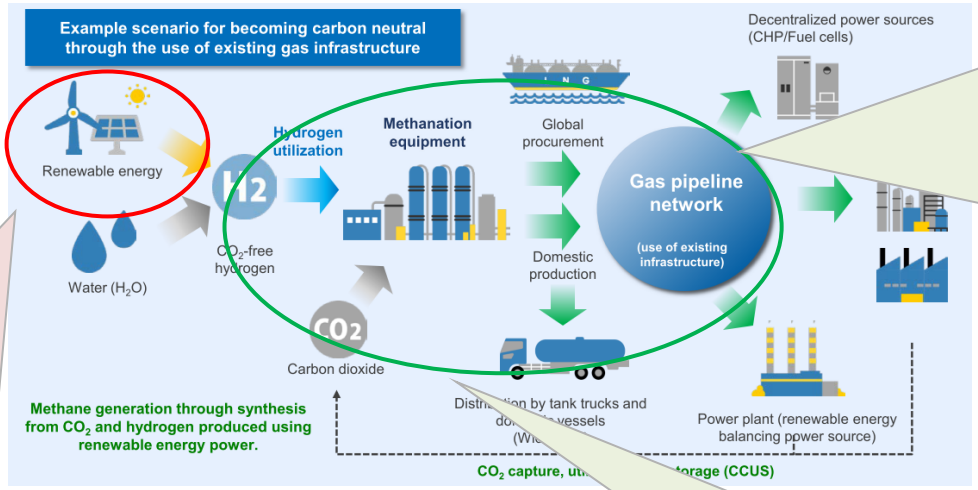
■ Transition Strategies and Science-based Targets (Elements 1 and 3) | Alignment of Osaka Gas' Roadmap with Roadmap for Gas Sector



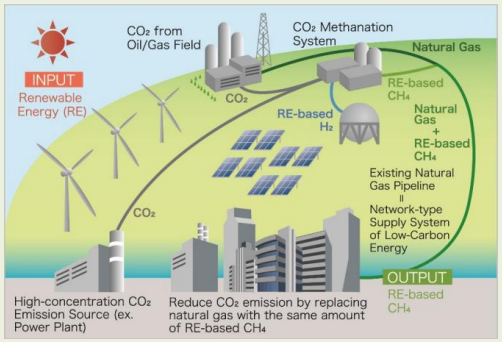
[Reference] Methanation Initiatives

- Osaka Gas is developing **innovative process technologies and conducting large-scale synthetic methane production demonstrations** for "methanation," which is important for gas decarbonization, and is also actively working to **secure renewable energy sources that will lead to the production of CO2-free hydrogen**, which is necessary as a raw material for the methanation reaction.

Scenarios for achieving carbon neutrality through methanation



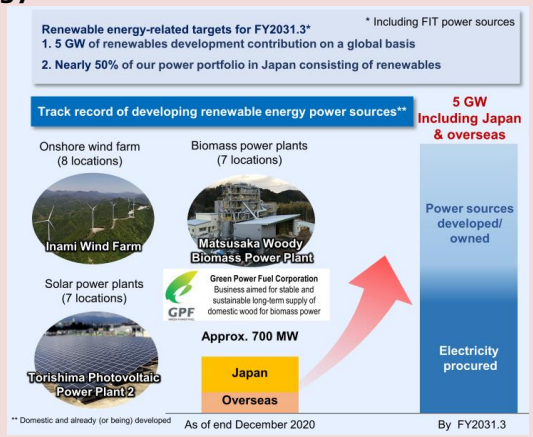
Development of the world's largest practical methanation technology



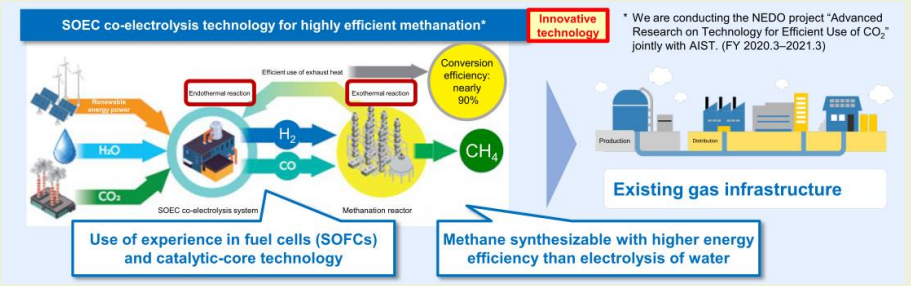
A technology development project to produce synthetic methane using CO2 recovered from the INPEX Nagaoka Mine will be implemented from the latter half of FY2024 to FY2025. **The synthetic methane produced will be injected into the company's city gas pipeline.**

Expansion of renewable energy sources

Decarbonization of power sources for hydrogen production is a major prerequisite for decarbonization of the city gas supply chain. **Decarbonization of power sources contributes to the expansion of the use of hydrogen and synthetic methane.**



Development of innovative methanation technology (example)



Source: Osaka Gas' documents, press releases and interviews.

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Key Points in the Case Study(Element 3: Science based Targets & Pathways)

- Osaka Gas has set a mid-term reduction target for part of Scope 3 and long-term reduction targets for Scope 1, 2, and 3, and has also set a target to reduce emissions in society as a whole by 2030 through fuel conversion in demand sectors (reduction contribution). The goal is to achieve net-zero emissions by 2050, including Scope 3.
- In addition, Osaka Gas has set a renewable energy development target of 5 GW*1 by 2030 and a renewable energy ratio of about 50%*2 in the domestic power business.
- The transition targets and pathways are also consistent with the METI's gas roadmap, which is consistent with the goals of the Paris Agreement.

＊1 Including feed-in tariff (FIT) applicable power sources such as solar power, wind power, biomass, etc.
＊2 Equivalent to about one-third of the current CO2 emissions of the Osaka Gas group and its customers (about 33 million tons/year)

Osaka Gas' Mid- and Long-term Targets

Target year	Scope 1,2	Scope 3	Reduction contribution	Other Targets
2030	-	**Reduction of 700,000 tons** (from existing scope3 part)	**Reduction of 10 million tons** (including Scope 1 -3 reduction)	Contribution to renewable energy development: **5 million kW**[*1] Renewable energy ratio in domestic power business: **about 50%**[*2]
2050	Carbon neutral		-	

Osaka Gas' GHG Emissions Breakdown (FY 2020)

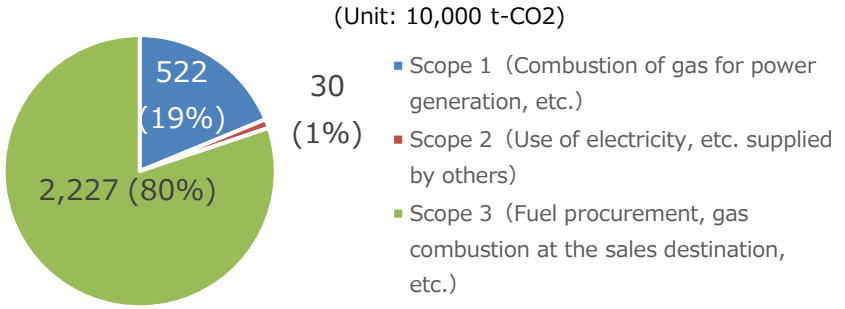


Image of CO2 emission reduction (METI's Gas Sector Roadmap)

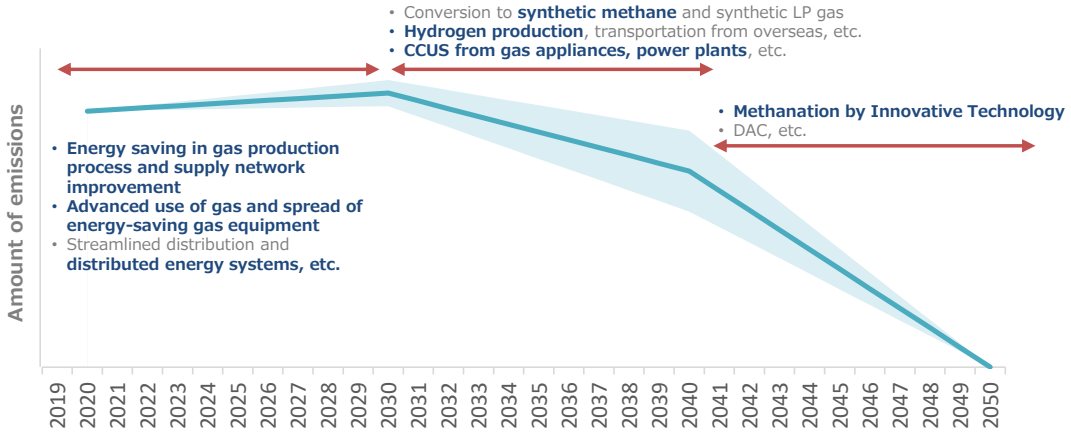
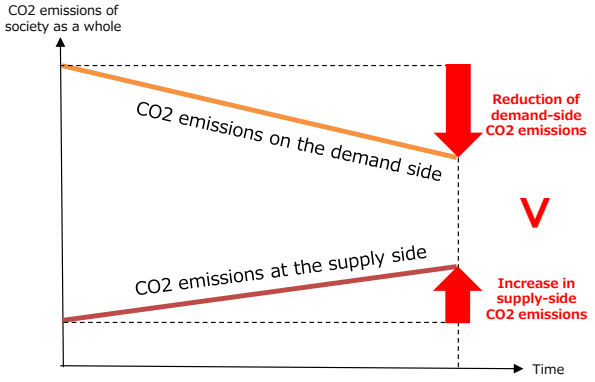


Image of Natural Gas Contribution to Reduction



As **the demand for gas increases due to the shift to low-carbon heat** such as fuel conversion to natural gas, **CO2 emissions from city gas will increase on the supply side, but will contribute more to reductions on the demand side**.

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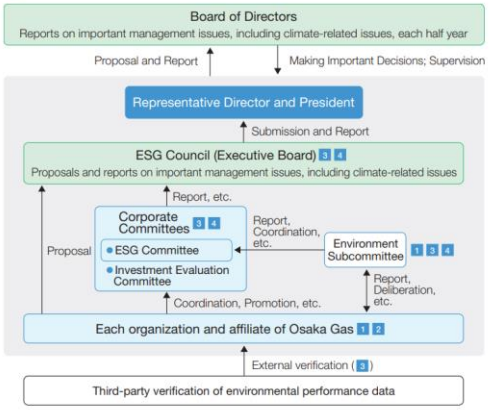
Key Points in the Case Study(Element 1: Transition Strategy and Governance, Element 4: Transparency)

Governance

- Recognizing the implementation of transition strategy as one way to promote sustainability, established a structure to promote such efforts at the management level.

■ Climate-related Risk Management Structure



1 Plan formulation
* Risks and opportunities associated with climate change
- Response to cross-cutting environmental* issues
- Formulation of environmental strategy*
- Reflection in activities of each organization

2 Implementation/Operation
- Actions for each target
- Performance tracking for each indicator

3 Checking
- Report and follow-up for each target and performance at the Environment Subcommittee, ESG Committee, and ESG Council (Executive Board)
- Third party verification of environmental performance data

4 Review
- Issue identification
- Evaluation of countermeasures and improvements

Environmental improvement effects of projects

- Contribute to a cumulative reduction of approximately 900,000 tons of CO2 emissions by 2030 through 5 projects using transition bonds to be issued this time.
- Environmental improvement effects will be reported on an annually basis until the bond redemption.

4 projects
Renewable energy related projects
(Solar power and onshore wind power)

1 project
Fuel conversion project
(Fuel conversion at pulp and paper mills in Shikokuchuo city, Ehime Prefecture. 【Shikoku Central Energy Co., Ltd.】)

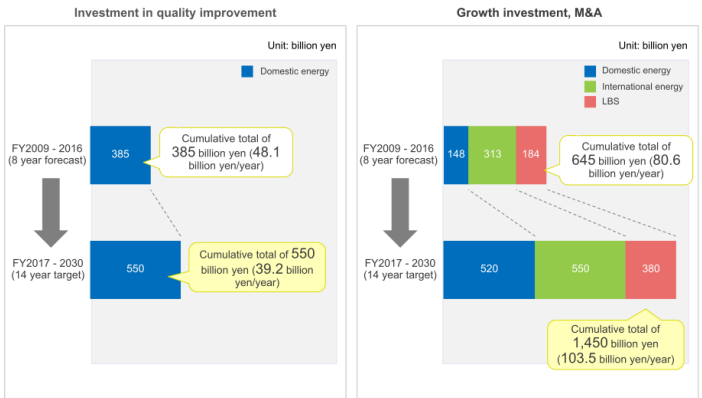
By 2030
Contributing to the cumulative reduction of approx. 900,000 t-CO2

(Achieving net zero CO2 emissions through the practical use of methanation in the medium to long term)

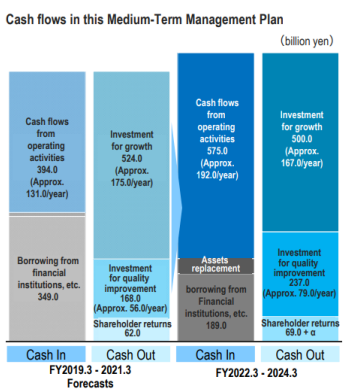
Investment plan

- Plans to invest a cumulative total of 2 trillion yen from FY2017-2030 as quality improvement investments, growth investments, and M&A, including the implementation of transition strategies
- Investment of 737 billion yen is planned for FY 2021-2023.
(including methanation, chemical looping, energy-saving equipment, R&D, renewable energy, and fuel conversion to natural gas, etc.)

■ **Investment Plan in Long-Term Management Vision (FY2017 – 2030)**



■ **Investment Plan in the Medium-term Management Plan (FY2021 – 2023)**



Cash In
Maintain financial soundness by reducing borrowing from financial institutions through asset replacement and growth of cash flows from operating activities.
(Increasing cash flows from operating activities by 50% from the previous period)

Cash Out
Implement strategic and selective investment for business growth in light of investment efficiency.
- Decarbonization area (Renewable energy in domestic and overseas, etc.)
- Areas where steady earnings contribution is expected (Business in North America, power source development, LBS business, etc.)
- New growth areas where strengths can be utilized, such as Asia

【Breakdown of investment for growth】 (billion yen)

	Domestic Energy	International Energy	LBS	
FY2019.3 - 2021.3 Forecasts	158.3	250.3	115.6	524.0
FY2022.3 - 2024.3	174.0	168.0	158.0	500.0

As for investment for quality improvement, we intend to increase investment in decarbonization, DX, and resilience enhancement.
We strive to distribute shareholder returns depending on our profit growth and in accordance with the Shareholder Return Policy*.

*Maintain stable dividends, a consolidated dividend payout ratio of 30% or higher

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Case Study: Osaka Gas Co., Ltd. Transition Bond

Modelability Review Results: Approval

Appropriate as one of the best practices for transition bonds focusing on business model conversion and transition.

Main Opinions

Transition strategy

- The strategy shows an intention to transform its business model from a gas company to an integrated energy company, and is a suitable case for a model project.
- It is also very important to note that the company is strongly committed to the introduction of renewable energy, which is necessary for future methanation, and is currently working on fuel shift from heavy oil and coal to natural gas.
- Overall, a very ambitious initiative, including methanation R&D such as SOEC, this case can be evaluated as suitable for model case.

Scientific basis

- In accordance with the transition strategy, in addition to the long-term goal of carbon neutrality by 2050, reduction targets have been set for a portion of Scope 3 in the mid-term, and these efforts are also aligned with the gas sector roadmap.
- While it is inevitable that CO2 emissions will temporarily increase toward 2030 due to fuel switching from coal, heavy oil, etc. to gas, the fact that quantitative mid-term targets for Scope 3 and renewable energy are also set is commendable.

Other factors/Others

- Renewable energy is essential for the practical application of methanation, and the focus on renewable energy is commendable based on an understanding of the positioning of the technology.
- In terms of the temporary increase in Scope 3, it is necessary to carefully explain to investors and gain their understanding of the medium-term targets and reduction contribution targets, the rising demand for gas, and the subsequent direction of net zero through methanation.
- If a vision is presented on how a certain amount of synthetic methane (the source of which is hydrogen and carbon dioxide) will be procured until the innovative technology is completed, including domestic carbon intensive industries and overseas partnerships, it will increase investors' understanding from the perspective of feasibility and make it easier to attract investment.