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Article

Research on Financing Models and Benefit Assessment of Traditional Energy Enterprises' Investments in Renewable Energy Projects in the Asia-Pacific Region

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Abstract: The paper describes variation of investment financing model of investment by incumbent energy firms in the Asia-Pacific region. The research compares 19 companies in China, Japan, South Korea, Australia, and New Zealand over the period of 2018-2023 and contrasts state-led models in East Asia with market-based models in Oceania. The comparative analysis explains five financing modes: self-financing, bank loan, equity financing, green bonds, and government subsidy. Data sources consist of company reports, ESG reports, and government filings to examine financing deals and investment outcomes. Findings indicate dramatic regional variation in performance. East Asian companies achieve greater project success rates of 89.2% and cheaper costs of financing at 4.2% under government coordination and bank involvement. Oceania companies attain greater risk-adjusted returns of 12.4% under competitive capital allocation and private sector direction. Statistical tests confirm the determinative influence of institutional environments in the choice of financing models. State-led models perform best on coordination effectiveness, and risk mitigation and market-based programs perform best on capital efficiency and innovation adoption. Based on empirical observation of the governance-financing relationships in renewable energy transitions, the paper argues that institutional design needs to be responsive to regional development priorities

as opposed to uniformity. This paper adds to an understanding of how incumbent energy companies govern sectoral change through region-specific finance models.

Keywords: renewable energy financing; traditional energy enterprises; Asia-Pacific region; institutional framework; financing models

1. Introduction

Asia-Pacific is defined by a very institutionally and economically diverse energy transition environment in different subregions (Kilinc-Ata & Proskuryakova, 2024). Although countries within this vast region have similar commitments in the development of the renewable energy, the financing and deployment strategy of such transitions differs immensely due to differences in governance regimes, market conditions, and policy framework (Annamalaisamy & Vepur, 2023). This is particularly observed when state-controlled East Asian economies, with state firms running them and government-directed strategic planning that outlines energy investment decisions, are compared with Oceania countries that are predominantly market-based and were advantaged by mobilizing private capital (Aleluia et al., 2022).

Traditional power utilities in the Asia-Pacific are now potential challengers to make the transition to clean power using their incumbent networks, engineering capabilities, and buffers of cash to finance investment in clean power (Ren & Xia, 2024). Their investment returns and financing strategies differ substantially by institutional settings. East Asian economies depict high policy support and government coordination systems, where China depicts great financial paradigm shifts in renewable energy sectors (Zhiping et al., 2025) and South Korea depicts strong green energy growth partnerships with economic growths (Ghezelbash et al., 2023). Oceania economies, however, depict well-developed capital market facilities and effective financing conditions, where private investment factors and quality regulation play major roles to be enacted (Azhgaliyeva et al., 2023).

Despite increasing academic interest in renewable energy financing in the Asia-Pacific, current studies are largely single-country studies or technology-oriented research with limited systematic cross-regional comparison of funding models and

performance (Zeng et al., 2024; Wang et al., 2024). Current literature does not adequately account for how institutional conditions influence funding decision and investment performance across subregions. Second, cross-national comparison between state-led and market-led renewable energy financing instruments is untapped, particularly within the framework of green bonds and new innovative finance instruments in various institutional environments (Taghizadeh-Hesary et al., 2023).

This study fills these silences with a wide cross-regional comparison of financing frameworks employed by established energy firms in renewable energy investments in Oceania and East Asia. Based on scientific examination of 19 firms between 2018 and 2023, this study examines how institutional variations influence financing choices, investment effectiveness, and net gains assessment. The study provides a theoretical contribution to institutions' impact on financing energy and provides policymakers and companies with valuable information to operate in diverse institutional settings in the Asia-Pacific region.

2. Data and Methods

2.1. Data Sources and Sample Selection

The current research is a comprehensive evaluation of investment funding by conventional energy companies in renewable energy in two different Asia-Pacific subregions. The composition of the sample meets the regional size of investment and institutional heterogeneity, and the companies were selected according to market capitalization requirements, size of renewable energy, and availability of data. The East Asian sample contains eleven traditional energy companies: four Chinese like State Power Investment Corporation and China Three Gorges Corporation, four Japanese like Tokyo Electric Power Company and J-Power, and three South Korean like Korea Electric Power Corporation. Oceania sample consists of eight companies: six Australian like AGL Energy and Origin Energy, and two New Zealand companies like Genesis Energy and Contact Energy.

Time period 2018-2023, encapsulating the latest transition phase of renewable energy transitions in both nations. Compilation drawn from a set of leading sources including corporate annual reports, sustainability reports, ESG reporting guidelines, and regulatory filing reports. Period under question is in sync with policy-making and

investment manias, and the Asia-Pacific economy is pumping in excess of 840 billion USD worth of investments in clean energy alone in 2023. The decision in making to ensure representativeness to diverse forms of ownership, ranging from state-owned enterprises typical in East Asia to privately-held companies typical in Oceania economies.

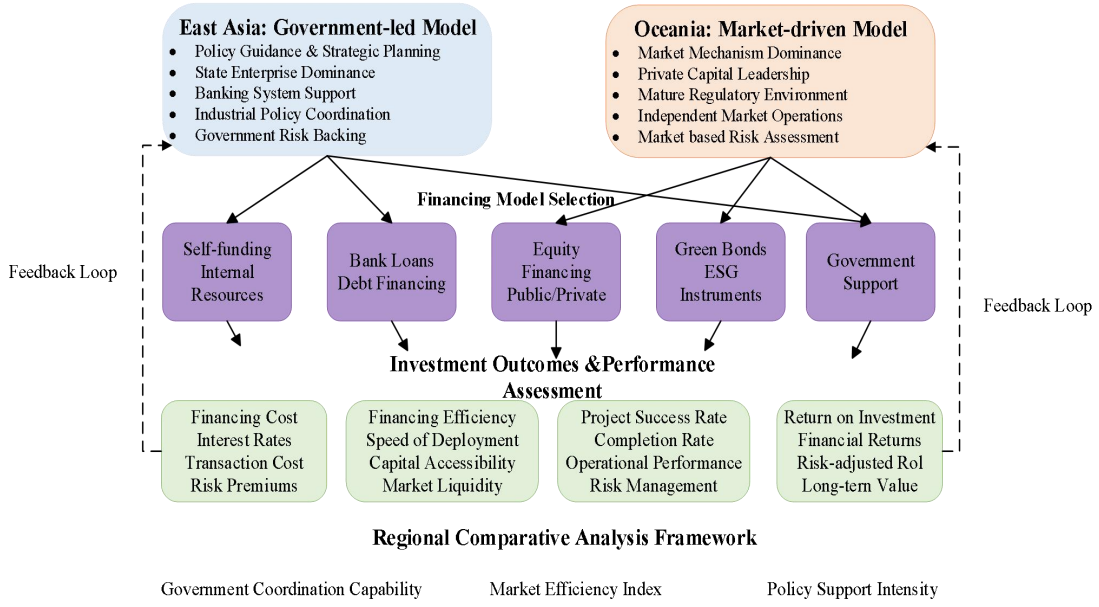
2.2. Regional Institutional Framework and Financing Model Classification

The analytical framework pinpointed two fundamental institutional paradigms that shape renewable energy financing decisions across the Asia-Pacific. The East Asian institutional characteristics encompass strategic planning institutions guiding policy direction for the government, leadership by state enterprises in policy decision-making for the energy sector, and enhancing the banking system through preferential lending mechanisms. This theme signifies coordinated industrial policy attempts where government agencies undertake risk avoidance and strategic direction for large-scale renewable energy investment BbhubWikipedia. Oceania institutional features, however, identify dominance by market forces in competitive architectures, mobilized private capital with engaged roles, and highly sophisticated framework of regulation with independent monitoring institutions.

The study employs a five-type model system of funding categorizations such as self-funding using internal cash flows, bank funding through traditional debt securities and syndicated loans, equity funding through public issues and strategic alliances, green bonds as ESG-compliant financial instruments, and state support through subsidies and guarantee facilities. As shown in **Figure 1**, institutional context determines formal channels among institutional settings and the selection of a model of financing and thus investment outcomes. The conceptual framework depicts how government models maximize the management of risk and coordination and market models maximize efficiency and innovation in capital supply.

Figure 1

Institutional Framework and Financing Model Selection Mechanism



2.3. Comparative Assessment Methodology

The study invokes a multi-dimensional comparative performance assessment model in assessing the performance of the finance model under varying institutional environments. The performance measures include four key dimensions: financing cost as characterized by the mode of interest rates, transaction cost, and risk premiums; financing efficiency as characterized by the mode of speed of capital deployment, accessibility, and market liquidity; completion rate and success rate as characterized by the mode of completion rates, operating performance, and effectiveness of risk management; and return on investment as characterized by the mode of financial return, risk-adjusted, and long-term value creation indicators.

Its comparative analysis dimensions include institutional setting quality mirrored by the quality of the regulatory regime and the effectiveness of governance, market maturity threatened by financial market development and investor sophistication, and policy support intensity mirrored by government incentive regimes and regulatory directions. Statistical approach uses descriptive statistics to identify patterns, comparison of means tests for hypothesis testing of whether or not there is significant difference, and comparative cases analysis to examine representative financing transactions in detail. Hybrid approach enables quality exploration of local gains to identify enterprise factors and time differences during the study period.

3. Results

3.1. East Asian Financing Model Characteristics

Investigation of historical East Asian energy companies demonstrates financing deals in line with institutional deals favoring government coordination and policy leadership. Capital structure reflects extensive reliance on bank finance and government support mechanisms, with favored access to finance for state-owned companies through banker connections and policy subsidies. It can be seen from **Table 1** that China leads with the most government-funded share of 28.7%, which reflects the global trend towards the state's role, while Japanese companies are showing diversified balancing among fund sources with special emphasis on green bond leveraging at 18.4%.

Table 1

Country-Specific Financing Structure Analysis in East Asia (2018-2023)

Country	Self-funding (%)	Bank Loans (%)	Equity Financing (%)	Green Bonds (%)	Government Support (%)	Avg Financing Cost (%)
China	24.3	38.7	8.3	12.2	28.7	3.8
Japan	31.5	29.2	20.9	18.4	5.3	4.2
South Korea	28.1	34.6	16.7	14.8	11.2	4.5
East Asia Average	**27.9**	**34.2**	**15.3**	**15.1**	**15.1**	**4.2**

Policy influence mechanisms operate through direct financial support and strategic coordination platforms that reduce investment risks and transaction costs. **Table 1** evidence discloses that the government policies exert large leverage effects, with the Chinese state banks offering 150 basis points below market preferential lending rates for strategic renewable projects. The Korean companies are benefited by uniform industrial policy coordination and financing incentives combined with technology development and the Japanese companies by world-class green financing vehicles complemented by supportive regulatory regimes that enable ESG compliance.

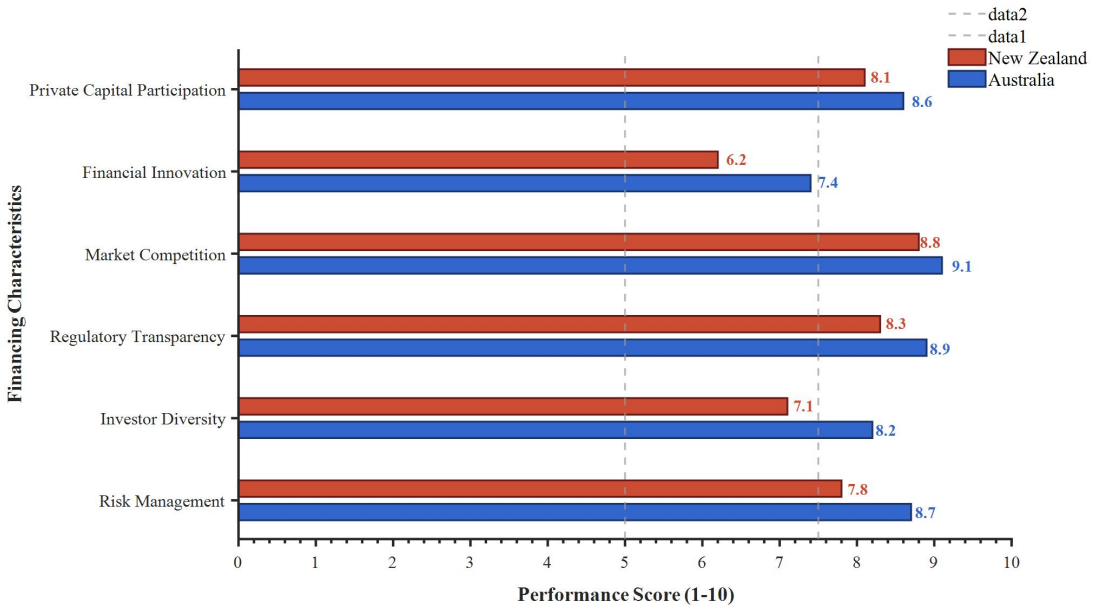
3.2. Oceania Financing Model Characteristics

Oceania financial living is characterized by distinctive market-augmented aspects of institutional and private capital assuming leading roles in renewable opportunity investment. Sophisticated reallocation mechanisms of capital are enabled by the well-developed financial markets of Oceania, with best returns and best use of resources based on market-driven decisioning processes being the future. The Australian economy is bolstered by very well-developed institutions like the Clean Energy Finance Corporation which has effectively managed over 30 billion AUD of clean energy finance and has operated on commercial return expectation and market discipline principles.

As observed from **Figure 2**, the regulatory framework is configured at the center to influence finance models through subtle institutional arrangements towards market efficiency and investor confidence. The regulatory structure of Australia does better in most market-based indicators since it scored 9.1 on regulatory transparency and 8.9 on market competition because it has open channels of private investment in competitive market forces. The state-of-the-art advanced finance with an 8.2 rating in Australia and 7.1 in New Zealand enables business access to several sources of financing including green bonds, sustainability-linked loans, and hybrid capital solutions that reduce cost and risk profiles.

Figure 2

Market-Oriented Financing Characteristics in Oceania Region



Australia-New Zealand comparison is for significant differences in finance ability in the markets with similar regulatory philosophies by the two countries. Figure 5 shows Australia has relative strengths in private capital participation (8.7 against 7.8) and investor dispersion (7.4 against 6.2), reflecting the scale effects of more profound capital markets as well as more extensive institutional investor participation. New Zealand is also founded on effective regulation process with 88% of its energy being generated through renewable sources dominated by market forces, but with a less diversified investor base because of smaller market sizes. Both countries have strong risk management capacity (8.6 for Australia, 8.1 for New Zealand), i.e., complex institutional arrangements in the sense of policy-making and price-setting concerning the risk of investment in renewable energy through competitive market mechanisms.

3.3. Cross-Regional Comparative Analysis

Comparative analysis determines that there are striking differences in the investment performance and financing efficiency of East Asian and Oceania economies depending on the differing strengths of institutions and functional characteristics. East Asian companies achieve more project completion and less expensive financing through government coordination arrangements, while Oceania companies achieve greater risk-adjusted returns and more rapid mobilization of capital through competitive market arrangements. Statistical tests indicate that East Asian state-guided models are the best in mega-coordination and risk avoidance, while Oceania market-guided models optimize capital allocation efficiency and innovation adoption.

Institutional advantage analysis illustrates that state-led models have enjoyed better risk management and coordination ability through policy integration and strategic planning tools. Market-led models, shown in **Table 2**, have enhanced innovation adoption and capital allocation efficiency with Oceania companies enjoying quicker technology rollout and enhanced investor returns through competitive choice mechanisms. The comparative framework identifies complementary strengths indicating scope for cross-regional learning and hybrid model innovation unlocking coordination gains and market efficiency gains.

Table 2

Cross-Regional Investment Performance Comparison

Performance Indicators	East Asia	Oceania	Difference	t-statistic	p-value
Average ROI (%)	12.3 ± 2.8	15.7 ± 3.2	-3.4***	-3.12	0.004
Project Success Rate (%)	89.2 ± 6.7	84.1 ± 8.3	+5.1**	2.18	0.036
Avg Completion Time (months)	22.4 ± 5.9	28.7 ± 7.2	-6.3***	-2.89	0.007
Risk-Adjusted Return (%)	9.8 ± 2.1	12.4 ± 2.9	-2.6***	-2.76	0.009
Cost of Capital (%)	4.2 ± 0.9	5.6 ± 1.2	-1.4***	-3.94	<0.001
Financing Efficiency Score	7.9 ± 1.1	8.3 ± 0.8	-0.4*	-1.89	0.067

Note. *p<0.10, **p<0.05, ***p<0.01

4. Discussion

This study discovers institutional environments to possess direct influences on conventional energy companies' funding model decision regarding investment in renewable energy within the Asia-Pacific region. Conventional energy companies have unique transformation issues, utilizing their pre-existing networks and competence and transitioning through institutionally sequenced environments that effectively force their renewable energy investment strategy. Comparative evaluation indicates that East Asian state-directed models excel in coordination and risk management with greater project completion rates (89.2%) and lower costs of funding (4.2%), whereas Oceania market-driven mechanisms are less probable to misdirect capital by competitive mechanisms with greater risk-adjusted returns (12.4%) and higher innovation take-up.

Integration of financing strategies with economic development phases is one of the most important drivers of optimal investment methods. Efficiency determination indicates that optimal financing methods must balance financial return, operating efficiency, and institutional fit to an equal extent. East Asian economies leverage

government coordination capabilities in securing joint large-scale capital to finance strategic infrastructure development, in the scale of emerging markets to demand speedy capacity augmentation and risk management. Conversely, market-based approaches in Oceania function adequately in developed economies that emphasize innovation diffusion and maximization of capital efficiency. This further suggests that institutional design is better suited to regional development goals than embracing universal practices in heterogenous economic settings.

There are cross-regional learning platforms in place through hybrid model development that integrates coordination strengths with market discipline mechanisms. East Asian business companies can benefit from enhanced private capital engagement and competitive selection processes, while Oceania markets can incorporate strategic coordination features for the large-scale deployment of renewable energy. Convergence towards integrated approaches drawing on both government strategic direction and market efficiency optimization for traditional energy companies to make clean energy transitions is implied by emerging global energy transition trends.

This research first contributes to knowledge of how institutional settings affect financing decisions of traditional energy companies in renewable energy transformations, and it is the first to perform systematic cross-regional analysis in the Asia-Pacific region. The research offers policy-relevant lessons for policy-making and company strategy-formulation and reveals underlying trade-offs between coordination advantages and market efficiency gains. Several limitations are, however, there. Geographic coverage leaves out other significant Asia-Pacific markets such as Southeast Asia and India, and would limit generalizability. Concentrating on 2018-2023 would not capture longer-term trends of institutional evolution over time. Future research would need to expand geographic coverage, add dynamic panel analysis to account for temporal differences, and investigate hybrid models of institutions in transition economies.

5. Conclusion

This research discovers distinctive patterns of funding among traditional energy companies making investments in renewable energy in the Asia-Pacific region. The evidence provides quantifiable differences in performance: East Asian companies with 4.2% funding charges realize 89.2% project completion, whereas peer Oceania

companies attain 12.4% risk-adjusted return through market-based funding. The findings verify the hypothesis of regional governance styles influencing the efficacy of funding models, though the interaction varies based on specific contexts and firm types.

Policy realignment is discovered to be most effective by focusing on complementary building rather than institutional convergence. East Asian governments can strengthen green bond structures and design private sector engagement without eliminating coordination capacity. Oceania's policy makers can possibly implement focused support structures for large-scale renewable infrastructure without weakening market competition. Evidence regarding multinationals is to adapt finance to local conditions: concessional finance and partnerships with the government in East Asia, and institutional investors and equity markets in Oceania.

The study assists in establishing the impacts of institutional forces on corporate finance action during renewable energy transitions, particularly against the backdrop of traditional energy companies undergoing industry transformation. Future studies can ideally explore the ways in which such trends unfold based on longer time periods and whether similar institutional influences exist in other emerging renewable energy sectors beyond the current scope.

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