



# Why Private Markets are the Best Capital Allocators for Energy Transition Investments



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**HONORS THESIS ABRIDGED REPORT**

Image Courtesy of Blackstone.

<https://www.blackstone.com/our-businesses/blackstone-energy-transition-partners/>

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# Agenda

1. Investment in the Renewable Energy Transition Thus Far
2. Governments and Energy Transition Investments
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5. Recommendations

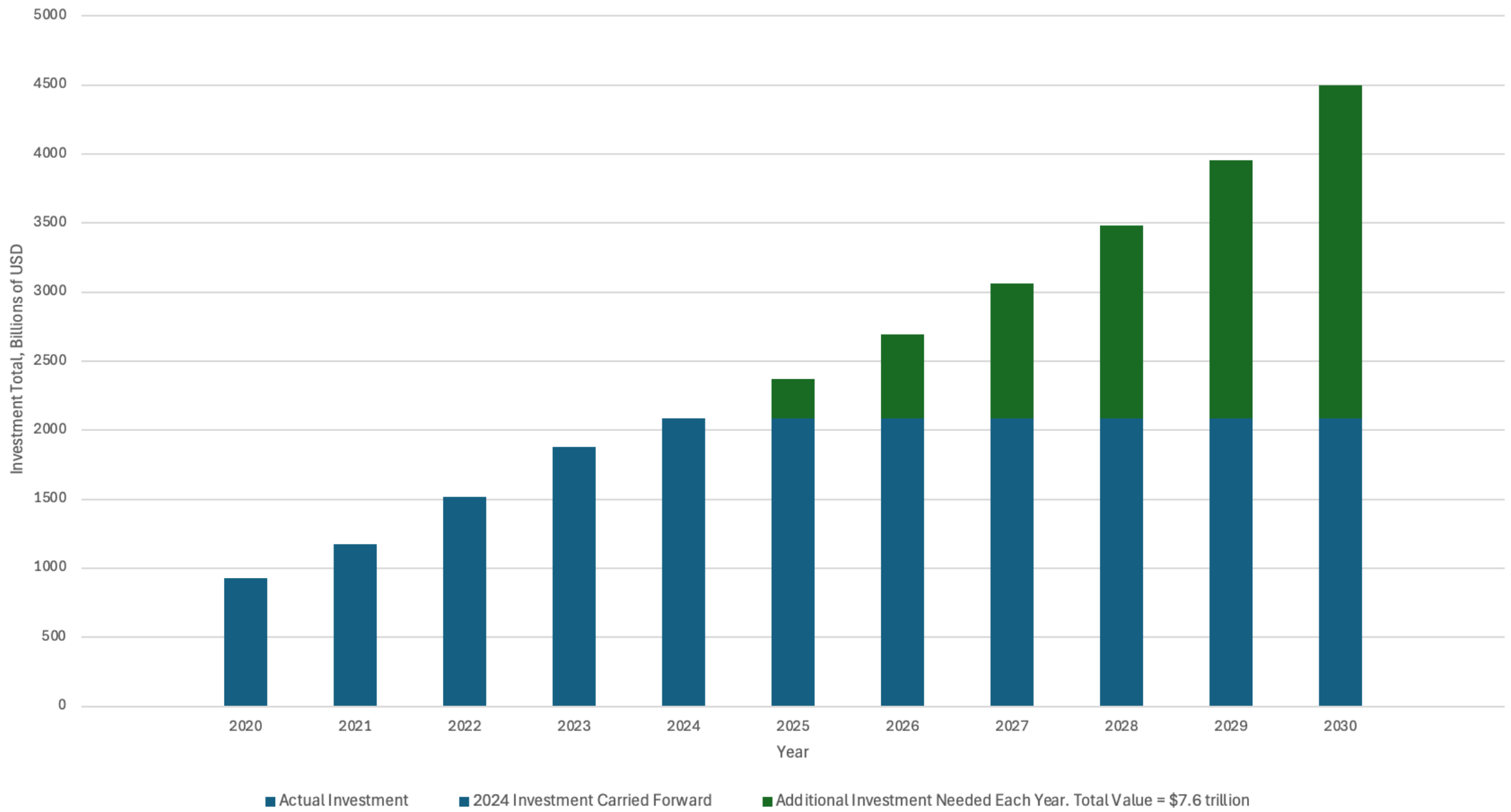
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# Investment in the Renewable Energy Transition

- According to the International Energy Agency (IEA), global investment in renewable energy (RE) and related infrastructure must reach \$4.5 trillion per year by the year 2030, in pursuit of goals that aim to limit global warming to 1.5° Celsius (IEA, 2023)
- In 2024, this investment total topped \$2 trillion for the first time (IEA, 2024a)
- Significant gaps remain in the amount of capital invested in the transition, and conventional financing methods are struggling to keep up with these essential growth targets



# Global Energy Transition Investment 2020-2024, and Necessary Additional Investment 2025-2030 (Billions of USD)



*Note.* Additional investment needed each year assumes constant growth from 2025-2030. Investment Total Data from BloombergNEF (2025). Target figure from IEA (2024a).



# Government Intervention in the Energy Transition

## **Investments in the Energy**

**Transition represent a form of public good for society.**

Because the benefits of avoiding further climate change are universal, and they do not diminish with enjoyment (non-excludable & non rivalrous), it can be beneficial to provide capital from governments to support this shift.

**According to the IEA, around 25% of total renewable energy finance from 2018-2023 came from governments (IEA, 2024b).**

# Issues with Government Support: Tax Credits

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**A common form of government support for renewable energy is tax credit programs.**

- Under the U.S Inflation Reduction Act, RE developers can claim 30% of their project investment, and \$0.0275/kWh of power produced by the project as tax credits against their federal tax liability (EPA, 2025)
- Due to high upfront costs and long-term payback periods, many developers don't have income with which to claim tax credits, so they sell these incentives to financing parties in a process known as "Tax Equity Finance"



# Tax Equity Finance

This form of deal has enabled RE development, but also represents an inability of firms to fully realize government incentives:

- Developers can sell tax credits to financing parties at ~75-95 cents on the dollar (Evercore ISI, 2024)
- In 2020, 50% of Tax Equity deals came from 2 large banks, and research has found that this lack of competition has favored larger RE firms in terms of investment (D'Alelio & Jiang, 2022)
- The total amount of credits available for Tax Equity transactions was \$47 Billion in 2024, and is likely to rise to \$100 billion by 2030 (Evercore ISI, 2024)

# Issues with Government Support: Policy Uncertainty

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**As policies such as tax credits are subject to the political process, they can be added or eliminated with swings in sentiment and support for the RE transition.**

- Because RE & infrastructure projects are long-term initiatives, this generates risk for developers and investors; policy support may not last throughout an investment
- Research has shown that this uncertainty drives volatility in investment for RE, and may have a stronger negative impact than when support is not available at all (Barrandale, 2010, 7703)
- Any form of government support that can be easily revoked by new political control can contribute to this issue for renewables

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# Public Markets & Energy Transition Investments

Across both equity and debt, public markets have played a significant role in funding the energy transition.

- In 2021, Initial Public Offerings (IPOs) of represented ~\$40 billion for the energy transition, but this has fallen as the equity capital raising environment has become more challenging in recent years (BloombergNEF, 2025, 4)
- Energy Transition debt totaled over \$1 trillion in 2024, with the majority of this coming from public market bond issuance (BloombergNEF, 2025, 5)

Image Courtesy of New York Stock Exchange.  
<https://www.nyse.com/listings>





# Issues with Public Markets & Energy Transition Investments

**Because stock markets are highly liquid, they can act as a court of public opinion around sectors and companies.**

- For example, XPLR Infrastructure, a publicly traded renewables firm, was highly affected by the election of President Trump in its stock price, dropping over 15% on news of the election decision (XPLR, 2025)
- Research has shown that "Climate Policy Uncertainty" can drive price volatility in publicly traded RE stocks, and this can eliminate some of the benefits of listing publicly (Alharbey & Ben-Salha, 2024)
- Publicly traded firms with renewable energy exposures will face inherent pressures; not all investors and political environments will favor these initiatives

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# Issues with Public Markets & Energy Transition Investments (cont.)

**On the credit side, public markets have been integral thus far, but also demonstrate significant pitfalls.**

- Over 60% of total debt issued for the energy transition was "labeled sustainable debt" in 2024 (BloombergNEF, 2025, 5)
- Labeling a bond as "Green/Sustainable" allows issuers to pay a yield that averages 8 basis points lower as a result; this represents a 5% decrease in cost of capital (Caramichael & Rapp, 2022, 14)
- Despite this advantage, FRB research indicates that compliance and issuance costs associated with labeling effectively eliminates this gain; to make matters worse, there is currently no binding set of principles that governs labeled debt issuance (Caramichael & Rapp, 2022, 5)

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# "Green/Sustainable" Bond Labeling

**The situation regarding "Green/Sustainable" labeled debt issuance means that:**

- Energy transition firms are unable to access an effective advantage in cost of capital despite the public good aspect of their operations
- Smaller firms are once again left behind, as the issuance & compliance process is necessarily expensive despite failing to keep bad actor firms from "greenwashing" (Caramichael & Rapp, 2022, 14)

**In summary, although investors display a preference for renewable energy debt investments through a decreased necessary yield on labeled bonds, public markets as of now do not support the realization of this benefit.**

483.03

# Implications of Public Market Exposures



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**If valuations for energy transition companies are affected by swings in public and political support, then public markets allow exposure to this volatility.**

- Public markets investors tend to favor shorter term gains, and renewable energy projects entail long payback periods, meaning there is a structural disconnect between the two (Dow et al, 2024, 2)
- Although some investors are clearly able to show a preference for energy transition investments, high liquidity of public markets during times of uncertainty eliminates this potential benefit

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# Private Markets & Energy Transition Investments

**Private markets can serve as the best capital allocators for further investment in the energy transition, due to the investors and capital structures involved.**

- Private markets investments are not listed on public exchanges, and include private equity (PE), venture capital (VC), and private credit (Blackrock, 2025c)
- Assets Under Management (AUM) in private markets is expected to exceed \$20 trillion by 2030, adding over \$7 billion from 2025-2030 (Blackrock, 2025c, 2)

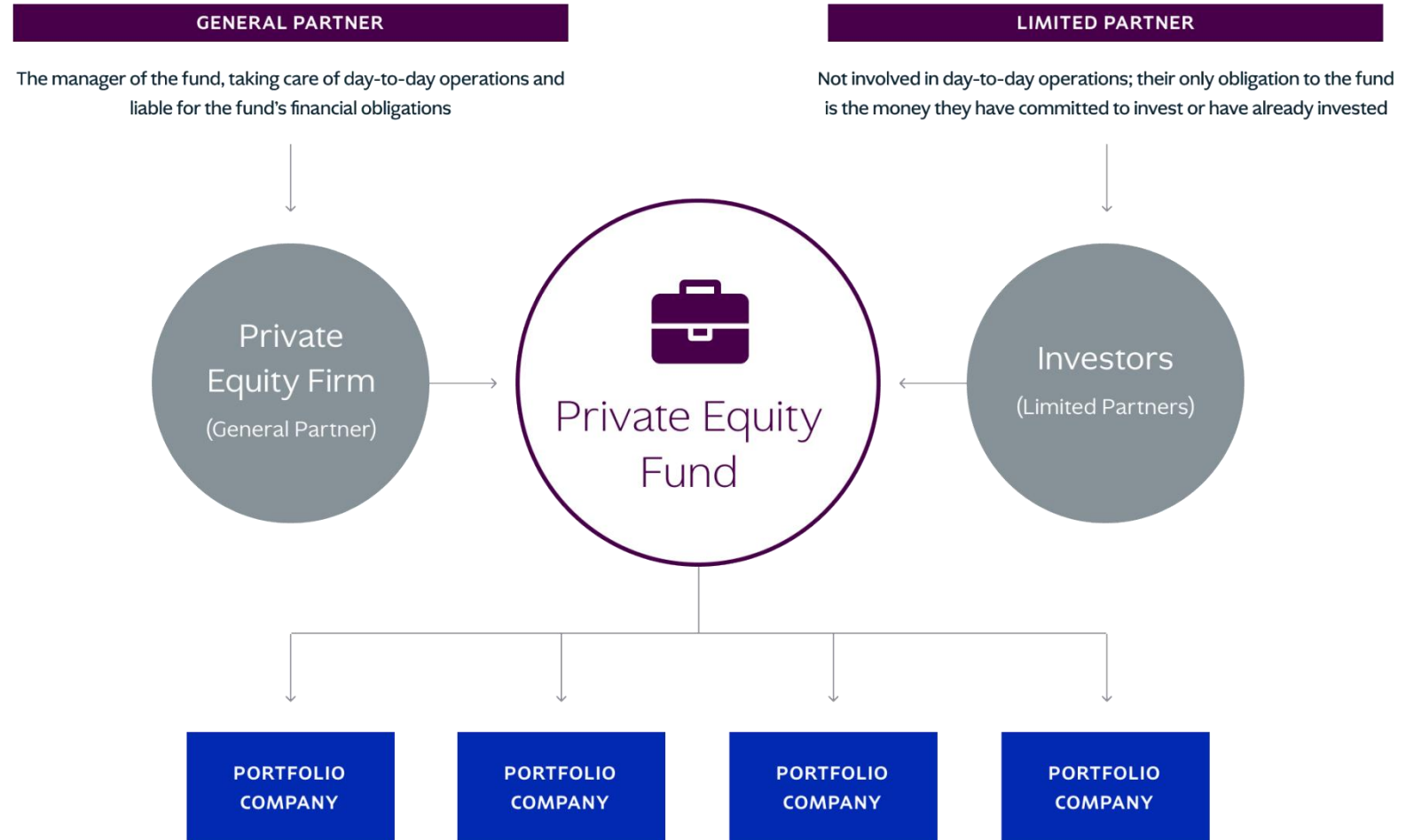
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## Private markets funds have longer-term investment horizons, aligning with the needs of renewable energy projects.

- Low liquidity within fund structures means that capital flight cannot easily occur with increasing policy uncertainty
- Fund theses can be tailored to specific causes, meaning investors involved can be focused on energy transition investments



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# Opportunity: Venture Capital

- Venture Capital (VC) funds are private investors that identify start-up enterprises, aiming to provide capital early in their development (Zider, 1998)
- Public markets and government investment both show disadvantages for emerging firms, VC can fill this gap
- VC investment can add value: research has found firms who obtained VC funding have been shown to display more innovation as a result (Khan et al., 2021, 5)
- Multiple VC firms with over \$1 billion in AUM have already devoted their fund purpose towards the energy transition (EIP, 2025a & Lowercarbon, 2025)



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# Opportunity: Private Equity

- VC can support early stage companies, but earning returns requires selling equity. Traditionally, this occurs through IPOs or M&A, but private equity (PE) funds can support energy transition firms best in this regard
- PE picks up where VC leaves off: PE funds aim to acquire established firms, improving them through operational changes and investment (KKR, 2025b)
- VC to PE deals have already become a frequent occurrence within conventional industries (Valorge et al., 2023)
- Long-term investments from PE (sometimes 10+ years) can insulate energy transition firms from policy uncertainty and resulting capital markets volatility
- PE giants Blackstone and KKR have invested \$23.5 billion and \$45 billion in the energy transition, respectively (KKR, 2025 & Blackstone, 2025)

KKR

Blackstone

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# Private Markets Advantage: "Basis Arbitrage"



Equity investment from private markets can enable further debt financing, since firms that are backed by long-term institutional investors are seen as having less risk. This attracts banks and other lenders, lowering the necessary cost of debt capital for portfolio companies.

- Within India's push to grow its renewable energy capacity, every \$1 of PE project financing has generated \$4 of debt financing, with a lower interest cost to the developer when a project is PE-backed (Gandhi et al., 2025, 2)
- The Climate Investment Funds (CIF) organization pools government funds from developed countries to invest in the energy transition in developing countries; these actions have enabled over \$11 of "co-financing" for every dollar of CIF funding invested (CIF, 2024)

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# Opportunity: Private Credit

**Private credit is expected to be the fastest growing asset class within private markets in years to come (Blackrock, 2025d, 14). Private credit funds, leveraging the limited partnership model, focus on making unique and tailored debt investments that are typically more versatile than traditional banks (KKR, 2025a).**

- As private credit funds use the same model as PE and VC, they can filter investors based on preference to energy transition investments
- Due to their bespoke lending capabilities, private credit funds can meet unique needs and risk profiles of renewable energy and related companies
- Industry research as identified private credit as critical to scaling the energy transition in the future (McDuffy et al., 2024)



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## Recommendations: Governments

**For policymakers, these findings indicate:**

- Public policy should focus on supporting private markets in the energy transition, through incentives for funds investing in such investments
- When the fiscal and political situation allows, direct investment should occur through committed capital from private markets models, such as the CIF, to avoid political investment volatility

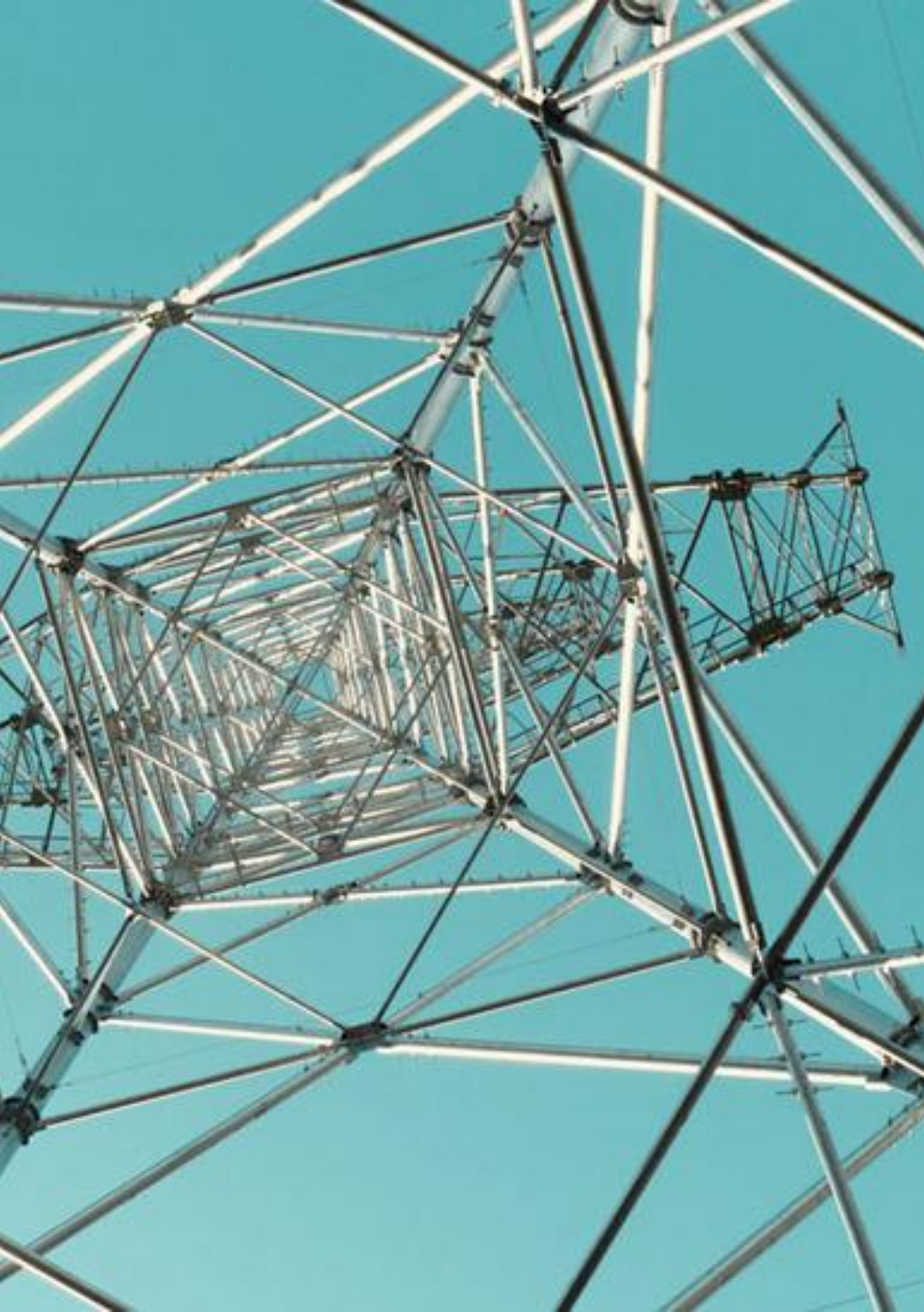


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## Recommendations: Energy Transition Firms

For firms operating in the energy transition:

- Leaders should pursue venture capital, followed by private equity ownership
- Business strategies should seek to avoid reliance on government incentives, to avoid perceived overdependence by investors
- Across equity and debt needs, firms should bypass public markets whenever possible



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## Recommendations: Investors

For individuals & institutions looking to invest in the energy transition:

- Accredited investors should display a strong preference to fund managers for energy transition initiatives
- Investors should support the growth of energy transition investment into private credit by showing preferences within the asset class
- By recognizing the enormous investment opportunity within the energy transition, investors can pursue returns while helping achieve global funding targets to mitigate climate change

Image Courtesy of Blackstone.

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**For a full reference list, please visit the thesis report.**