



PENN *Office of*
INVESTMENTS

SUSTAINABLE RETURNS

NET ZERO UPDATE | May 2024



EXECUTIVE SUMMARY

The endowment's mission is to support both current and future generations at Penn. Totaling \$21 billion as of June 30, 2023, we expect the endowment to distribute just over \$1 billion this fiscal year to fund scholarships, teaching, research, medical innovation, and thousands of other programs and initiatives across the University. Penn's Office of Investments manages the endowment on a day-to-day basis, overseen by an Investment Board consisting of University trustees. Penn partners with external investment management firms; they, in turn, select individual companies in which to invest. These investment manager relationships span the globe, encompassing investments across a range of asset classes and strategies.

Three years ago, the Office of Investments set a goal of reducing the net anthropogenic greenhouse gas emissions associated with the endowment's investments to zero by 2050. Our approach prioritizes real-world decarbonization while always pursuing our mission of maximizing long-term risk-adjusted returns for the University and its health system. Our periodic community updates highlight areas of focus for the Office, including carbon accounting, manager engagement, and investments related to the energy transition.

Over the past year, a core focus for the Office has been the development and implementation of a framework to assess how our investment partners incorporate material sustainability considerations into their investment processes. In this update, we summarize that work and report key insights from our engagements with our buyout managers. We also share an update on Penn's investments related to the energy transition, which comprise approximately 2.5% of the endowment as of fiscal year-end. Though this exposure may vary significantly year over year, we believe it is likely to trend higher over the medium and long term, as we continue to identify opportunities to generate attractive risk-adjusted returns related to the energy transition.



ENGAGEMENT & RESEARCH

Since our last update, the Office has deepened its engagement with the endowment's private equity managers regarding their sustainability efforts. We developed a framework to understand investor efforts in five core categories: Organizational Commitment, Governance & Resourcing, Underwriting Process, Value Creation & Measurement, and Reporting. As markets begin to explicitly price the negative externalities of greenhouse gas emissions, the framework allows us to more systematically ascertain how our investment partners identify, underwrite, and manage the emissions footprints and climate risk of their portfolios. We also aim to understand, in greater depth, how our managers pursue decarbonization at their portfolio companies. A third core objective of our ongoing conversations is to encourage our managers in the private markets to measure and report the emissions footprints of their portfolios in a more robust and standardized fashion.

The Office piloted this new framework with select buyout managers in our private equity portfolio. As the majority owners of private businesses, Penn's buyout managers can use their control to drive portfolio companies to implement value-accretive real-world decarbonization initiatives and to improve their emissions reporting. Although many of our investment partners are producing increasingly robust sustainability reports, our direct engagements have allowed us to understand more deeply how our managers are incorporating material environmental considerations when underwriting and managing their investments. While we review each element of our framework during these conversations, we ultimately center these discussions with our buyout managers around their Underwriting Process, Value Creation & Measurement, and Reporting.

UNDERWRITING PROCESS | Many of our buyout partners have made significant progress incorporating into their underwriting processes any material risks posed by climate change and other environmental factors. Whereas most buyout managers historically addressed environmental risk to physical assets during acquisition



diligence, updated approaches now consistently incorporate an expanded set of financially material sustainability issues. For example, several of Penn’s managers now systematically evaluate a company’s climate risk exposure, energy transition potential, baseline carbon footprint, resource efficiency, and the actionability of any decarbonization initiatives before executing on an investment. A few managers have identified biodiversity as a growing area of focus beyond emissions. Notably, rather than evaluating these sustainability considerations independent of other diligence, we found leading managers identify these considerations early in their underwriting process and authentically integrate them into the firm’s investment decision-making.

VALUE CREATION & MEASUREMENT | Penn’s buyout partners directly drive the growth, strategy, and operational efficiency of their underlying holdings in collaboration with the executives managing these companies on a day-to-day basis. A number of our investment managers have updated their operational approaches to incorporate the material sustainability risks and opportunities raised by the deal team’s diligence. Some of this work begins with governance. Firms noted their focus on building alignment with management teams about the importance of sustainability-related issues, and several of our partners highlighted the significance of articulating sustainability initiatives at the board level to reinforce executive accountability. Having helped set a course, our partners typically work closely with portfolio company executives to develop action plans, chart out staffing solutions, and establish processes to measure and report key metrics. Penn’s managers described how they are helping portfolio companies implement decarbonization initiatives ranging from greater use of renewable energy and EV fleets to setting internal carbon prices.

REPORTING | As we have discussed in prior updates, calculating the endowment’s carbon footprint requires aggregating emissions data across thousands of underlying companies. The coverage and quality of emissions reporting varies considerably across our buyout portfolio. Last year, the Office joined the ESG Data Convergence Initiative (DCI), an industry effort to standardize the reporting of emissions data and other key sustainability metrics in the private markets. By encouraging our partners to measure and report holdings-level emissions data consistent with industry standards, we hope to unlock a robust data set to measure the endowment’s footprint in coming years. While we are heartened by the strides our buyout managers have made to report emissions in the last year alone, we



expect coverage to expand at a modest but steady pace in the near term.

The Office found these initial framework implementation conversations to be highly productive. Similarly, our partners appreciated our ability to share insights sharpened by conversations with numerous firms across the industry. For example, over the course of our manager discussions we have been able to observe both best practices and common opportunities for growth. We shared these generalized takeaways with each manager in our sample set, along with more targeted feedback. We also curated a list of sustainability-related expert consultants and other service providers recommended by our partners, then introduced them to others in the portfolio. By taking a constructive approach that helps managers with their efforts, in part through accelerating the sharing of best practices, we believe we can both contribute to positive change and serve a valuable role to our partners.

These framework engagements have also given Penn deeper insight into the philosophies, processes, and challenges around our buyout managers' approaches to sustainability. We developed a more nuanced understanding of how our partners approach, underwrite, and manage material sustainability considerations. As we continue to baseline the portfolio and then revisit these assessments through time, we will track how Penn's managers advance. Ultimately, deepening our dialogue around sustainability with our managers will help the Office and our investment partners drive better long-term risk-adjusted return outcomes for Penn.



INVESTMENTS

Funding investments that drive real-world decarbonization remains one of the most impactful ways in which Penn will contribute to the energy transition. Today, we estimate that approximately 2.5% of the endowment is invested across about 200 companies supporting the energy transition. Our 30 largest look-through holdings represent the significant majority of this exposure, with a long tail of early-stage, venture-backed positions accounting for the remainder. We expect the endowment's overall exposure to companies engaged in the energy transition to fluctuate meaningfully over short periods of time, driven by new investments, exits, updated valuations, and other factors. Assuming the opportunity set remains attractive, however, the Office expects this exposure to grow over the long term.

Since our most recent update in May 2023, Penn has funded three new co-investments alongside existing investment partners in companies that are directly or indirectly driving real-world decarbonization.

TRANSFORMERS

The endowment partnered with one of Penn's private equity partners to co-invest in a company that designs, manufactures, and distributes specialty transformers. Transformers adjust voltages up and down at critical junctures on the grid to allow the safe and efficient transmission and distribution of electricity. An undersupply of transformers would hinder the expansion and fortification of the aging US power grid, which is urgently needed to meet the forecasted surge in demand from widespread electrification. This company sells its transformers to customers that develop renewable energy projects and EV charging infrastructure, which are crucial accelerants of real-world decarbonization. The company will use



this infusion of capital to expand its manufacturing capacity and further build its specialized workforce, ultimately increasing the supply of transformers to these end markets.

EV FLEET CHARGING INFRASTRUCTURE

Penn co-invested in a company that develops charging infrastructure solutions for commercial EV fleets. The company acquires and secures power supply at properties near transit hubs to develop a network of charging facilities that meets the increasing demand of enterprise fleets. While electric vehicles and charging companies have encountered near-term headwinds in the passenger market, EV demand for freight purposes—from last-mile package delivery to heavy-duty long-distance trucking—continues to grow. Substituting primarily diesel-fueled engines with hybrid and fully electric alternatives will significantly reduce the freight industry's emissions footprint. To do so, however, requires a reliable network of charging stations along major arteries and, eventually, across the country. This latest capital infusion will extend the company's charging station footprint across the US, ultimately supporting the continued adoption of freight EVs.

EV CHARGING INFRASTRUCTURE MAINTENANCE

Recent concerns about EV charging companies helped create the conditions for the endowment to co-invest alongside one of Penn's buyout partners in a company that designs, installs, and maintains EV charging stations for a diverse set of clients. After performing the upfront construction and installation, the company enters long-term service agreements to support the EV network. This capital infusion will scale the company, both organically and through platform acquisitions, to become the nationwide leader in commercial EV charging installation and maintenance. By facilitating the buildout of EV infrastructure in the US and improving its reliability, the company should play an important role in supporting EV adoption.



Low-carbon power and energy storage solutions continue to garner interest and capital from Penn’s managers. One partner increased its investment in a next-generation geothermal company after the company’s pilot project successfully produced zero-carbon baseload electricity for its anchor corporate customer. Others have invested in short- and long-duration storage solutions needed to stabilize the grid by regulating the growing supply of intermittent wind and solar power. One such manager owns a growth-stage company developing a gravity-based storage system. Another company is pursuing grid-scale battery technology. A handful of Penn’s venture capital managers have funded next-generation nuclear companies advancing small modular fission reactors, in addition to seed-stage companies exploring nascent nuclear fusion solutions. New investments include companies directly and indirectly cultivating the supply of renewable natural gas, hydrogen, and biofuels. In the electric mobility space, our managers are funding manufacturers of next-generation batteries, developers of high-capacity materials for these innovative batteries, and companies whose software solutions improve battery management.

Several Penn managers continue to invest in high-potential companies that decarbonize and minimize waste from industrial processes. One manager owns a company helping decarbonize manufacturing facilities by supplying more efficient steam turbines, as well as systems that recover and reuse waste heat. Multiple portfolio companies use innovative practices to reduce the life-cycle emissions of aluminum and steel products. Others are looking to further circular ecosystems by isolating reusable materials from industrial waste to recycle and repurpose for a variety of uses. One of Penn’s partners invested additional capital to help industrial emitters mitigate their methane emissions and decarbonize their operations.

Finally, one of Penn’s energy transition specialists continues to capitalize companies selling products and services across the preceding end markets. One such portfolio company tests and maintains high-voltage electrical equipment used in renewable power generation and industrial end markets. Others provide engineering, procurement, and construction services to build or repower community solar projects and other utility-scale renewable energy infrastructure.

