

Technology investment in the built environment and the path to net zero



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The transition to net zero will almost certainly be one of the most significant capital outlays in history. A 2022 report from Goldman Sachs noted that Electrification ‘is poised to revolutionise European Economies and our everyday lives’ and that this effort would ‘need to mobilise €3.7 trillion of capital, most into green energy infrastructure, to develop renewables, upgrade power grids, refurbish buildings and to support the switch to electricity for mobility real estate and manufacturing.’ A report from BNY Melon and Fathom consulting called this ‘the largest redeployment of capital in history’, and we believe that this is particularly true for the real estate market, which will have one of the most difficult challenges in transforming almost every aspect of how it builds, maintains and operates its assets.

For some, this transition will be a cost that brings down margins and returns. For others, however, this represents a transformational opportunity as the transition will come on the back of new technologies and business models. Venture capital investing in the built environment is squarely in the second camp – backing the next generation of companies that will enable the trillions of dollars in capital that will be deployed in the next decade. And the companies that develop these new technologies to heat / cool buildings, electrify transportation, generate and store energy and manage and control operations will emerge as the next generation of market leaders in the same way that Google and Microsoft emerged as dominant players in the information age.

Sustainable Future Ventures (SFV) is a venture capital fund focused on precisely this segment - investing in technology solutions that positively impact the built environment. SFV focuses on investing in high-growth companies with commercial revenues and validated product-market fit that are looking to scale. While the fund is independent

and focused on generating returns, its strategic relationship with PATRIZIA gives us unique insights and perspective on this opportunity.

One such insight has been the massive challenge around retrofitting our existing stock of buildings in order to achieve a lower carbon footprint. The reality is that retrofitting a building can cost more money than the energy savings can justify or that investors and tenants are prepared to pay. There are some old buildings that we can’t entirely retrofit. Moreover, the carbon emissions associated with new buildings aren’t going anywhere soon. In other words, as things stand, real estate companies will struggle to reach their carbon goals this decade.

At SFV, we found two opportunities to address this problem with transformative technologies:

Gradient – Window Heat Pump

Heating and cooling are responsible for as many as 5 GT of CO₂e emissions. As bad as this sounds, the more significant issue is that it is getting worse as rising temps, populations, and income levels will lead to many more air conditioners - and another 1GT in CO₂e emissions by 2050. Fossil-fuel heating systems continue to be installed faster than heat pumps. This is increasing global heating emissions and expanding the pool of buildings that will eventually need to be retrofitted. A big reason that heating and cooling emissions are trending in the wrong direction is that there is a lack of climate-friendly and easy-to-deploy solutions on the market.

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Enter Gradient, which has created a heat pump that is as easy to install as a window AC unit. The company has taken the two parts of a heat pump – the outdoor condenser and indoor evaporator – and combined them into a single piece of equipment that sits in a window without blocking views. The system removes the need for a professional installer or the cost and hassle of making holes in walls or installing the outdoor condenser. The solution is especially well designed for the multi-family residential space, particularly in older buildings in cities like New York, Seattle or London, which often lack an easy path for retrofitting. This challenge is notably acute for social housing, which often lacks air conditioning but are frequently seeing temperatures in excess of 90°F / 32° C. The New York City Housing Authority is keen to address this problem and recently awarded a \$24M initial purchase order for Gradient’s units. Several

other US cities are watching this deployment closely. SFV invested in Gradient in 2022 to help fund the company as it scales up to meet the demand of what we expect to be a large and fast-growing market.

Carbonfuture – Carbon Removal Credits

While real estate companies are focused on removing as much CO₂e from their operations as possible, we aren’t likely to achieve a 100% reduction or even the 50% reduction that PATRIZIA targets by 2030 with operational improvements alone. This is particularly true if you include embodied carbon from construction or retrofit processes that require concrete, steel or other building materials. So what are the options for real estate companies that are still keen to achieve their goals? We believe that Carbon Removal Credits are a key piece of the puzzle.

Carbon Removal Credits are tied to processes that actually pull carbon dioxide from the atmosphere (note this differs from Carbon Offsets, which are tied to reducing harmful practices like burning fossil fuels or cutting down trees – these reduce CO₂ emissions but do not actually remove existing CO₂). Microsoft, Alphabet and Swiss Re are among the big-name companies committed to using carbon removal credits. Still, we expect the list to grow quickly, particularly as more and more companies focus on removing carbon as opposed to offsetting carbon. Right now the price per ton of removed carbon is \$100 - \$150 (with much higher prices for technologies like direct air capture). If carbon removal technologies achieve a removal capacity of 500Mt by 2030 that implies a market size of \$50B - \$75B.

Carbonfuture, based in Freiburg, Germany, is an end-to-end platform for companies who want to participate in removing carbon from the atmosphere – and it is gaining increasing attention from the industry. The company’s platform monitors carbon removal processes, and reports their impact using its own tracking platform with third-party certifications. Carbonfuture’s marketplace solution then allows those companies to sell their offsets to corporate buyers. SFV invested in Carbonfuture in 2022 as it sees its technology as being a key enabler of this massive emerging market.

Under growing regulatory and social pressure, real estate calls for innovations that will make targeting net zero a realistic, financially viable ambition. For investors willing to take a risk and identify transformative technologies, the rewards will be undeniable – for their returns, the built environment and the planet.

