

DIAMOND HILL

INVESTED IN THE LONG RUN

An Unlikely Foot Soldier in the Climate Change Battle

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Combating climate change, in many ways, is compelling humanity to develop environmentally friendly and sustainable ways to meet our needs. We have made slow but steady progress in lowering greenhouse gas emissions, but a lot more needs to be done. In the future, existing and yet unknown technologies could work in tandem to wean humanity from environmentally hazardous substances and processes.

When considering investments in sustainable technology businesses, we evaluate cost of ownership relative to existing “dirty” technologies, potential for mass adoption and how economic benefits are shared between consumers and shareholders. In some cases, economic and environmental benefits accrue in large measure to customers and society with scant value creation for shareholders. In other cases, most of the economic value gets allocated away from equipment makers to other areas within the value chain.

One equipment maker that checks all the right boxes from our perspective is Energy Recovery, a manufacturer of pressure exchanger (PX) devices used to increase energy efficiency in industrial processes involving high-pressure pumping of fluids or gases. Today, the company’s PX devices hold a 90%+ market share in large scale desalination projects, and the device is more efficient and lasts longer than its competition, which results in a lower total cost of ownership in our view. These devices operate at near physical limits of efficiency (98%), are cost effective (typically under 2% of overall project budgets), exhibit almost no wear and tear after more than a decade of use, are mission critical and have a long-established solid reputation in the industry, so there is little or no incentive for customers to purchase a competitor’s product. Today, the company’s gross margin is almost 70% and partly reflects some pricing power created by its attractive product characteristics.



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In addition, the company’s pressure devices are on the cusp of playing an important, if not dominant, role in substituting hydrofluorocarbons (HFCs) with carbon dioxide (CO₂) as refrigerants, which could reduce the global warming potential (GWP) of heating, ventilation, air conditioning and refrigeration (HVACR) equipment by 2,000 to 4,000 times. We believe that even if the company faces stronger competition in the future, especially in the HVACR market, the end markets are large enough to comfortably accommodate multiple participants.

Desalination

To understand Energy Recovery’s earnings potential over the long run, it’s essential to understand desalination, HVACR and industrial wastewater end-markets.

According to the United Nations, nearly half the global population (around 4 billion people) live in areas that face water scarcity at least one month per year, a number that could increase to 4.8–5.7 billion people by 2050. Moreover, about 96% of liquid freshwater globally consists of groundwater, but withdrawals for drinking water, agriculture and increased aridity due to climate change have significantly distressed 13 of the 37 largest aquifers globally.¹ NASA further estimates that it takes 10,000–20,000 years to fully recharge groundwater, so we believe it should be considered a non-renewable resource for practical

purposes. Regions don't need to face perennial water shortages to deploy desalination-based solutions, in our view, and we might be approaching an inflection point in adoption rates.

Seawater desalination using reverse osmosis (SWRO) is the most cost-effective way to produce freshwater, a process where Energy Recovery occupies a dominant position. About 50% of the global population lives within 60 miles of saltwater, and SWRO could play an important role in addressing freshwater shortages long term.

Today, we believe the desalination market is still subscale, and yet costs are competitive with alternative solutions such as rainwater harvesting and river linking projects. As desalination increases, fresh water's wallet share should remain manageable over the long term in our estimate. We believe conservation alone will not be nearly sufficient to sustain the world's freshwater reserves, so we anticipate robust revenue growth rates for Energy Recovery's desalination products for the foreseeable future, albeit punctuated by inherent variability in desalination construction projects.

Refrigeration and HVAC

Refrigeration and HVAC equipment mainly use HFCs as refrigerants and have a GWP of 2,000–4,000 depending upon the type of refrigerant used and its application. CO₂ has a GWP of 1 but requires much higher operating pressures to be effective in cooling applications which requires greater energy consumption, especially when ambient temperature is high. As such, use of CO₂ has been restricted to regions that have low ambient temperatures and where regulations are more stringent i.e., Northern Europe. About 125 countries have accepted an agreement to phase out use of HFCs over the coming years, and the Environmental Protection Agency in the US has developed rules to phase out the production and import of HFCs. Replacing HFCs with low GWP refrigerants is imperative for the environment and is backed by regulation, but broad adoption of CO₂ as a refrigerant has proven to be uneconomic thus far, especially in warmer climates.

Energy Recovery's PX device — both in theory and lab tests — significantly lowers energy consumption when using CO₂ as a refrigerant and produces even greater efficiency under higher ambient temperatures. An independent scientific research paper sponsored by the US Department of Energy examining Energy Recovery's PX technology suggests that the company might have the highest efficiency solution on the market. We believe the company has a significant opportunity to gain a meaningful market share and possibly dominate the CO₂ based refrigeration and HVACR markets over the long term.

From a revenue perspective, HVACR end-markets are a positive for Energy Recovery — they carry several billion dollars of annual revenue potential for PX devices, and the market is mature, with 70%–80% of demand coming from replacement needs, which could improve the mix of recurring revenues.

Industrial wastewater

Wastewater treatment and drinkable water are inherently linked. It's essential that we do not pollute our shrinking freshwater supplies, and to that end, we expect a concerted effort by governments and corporations to enforce treatment of industrial wastewater discharges. For example, batteries used in electric vehicles are very water intensive and could be a growth area for Energy Recovery in treating water discharge. The company's PX devices significantly lower energy costs when contaminated water is treated through reverse osmosis membranes, meaning industrial wastewater treatment could be a significant growth market for Energy Recovery.

Conclusion

There can often be a conflict between what is good for investors and what is good for the planet. We believe that Energy Recovery will excel in both areas, and we were pleased to be able to add the stock to our portfolios at an attractive price.

¹Source: NASA.

As of 30 June 2022, Diamond Hill owned shares of Energy Recovery, Inc.

The views expressed are those of the author as of July 2022 and are subject to change without notice. These opinions are not intended to be a forecast of future events, a guarantee of future results or investment advice. Investing involves risk, including the possible loss of principal. Past performance is not a guarantee of future results.