TCW Sustainable Insights

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# A Transition Opportunity – Investment Framework in Action

The transition to a low carbon economy involves complicated economic and geopolitical paradigm shifts. TCW's Sustainable Investment Group has developed a framework for investing in this transformation by parsing through complexities to identify investment opportunities across the transition-related value chain. Although the transition necessitates systems changes that cut across nearly all sectors of the economy, energy generation and consumption sit at the core. As such, this piece focuses on the potential transformations of the energy system and the investment opportunities they present.

## The Energy System and Its Transformation

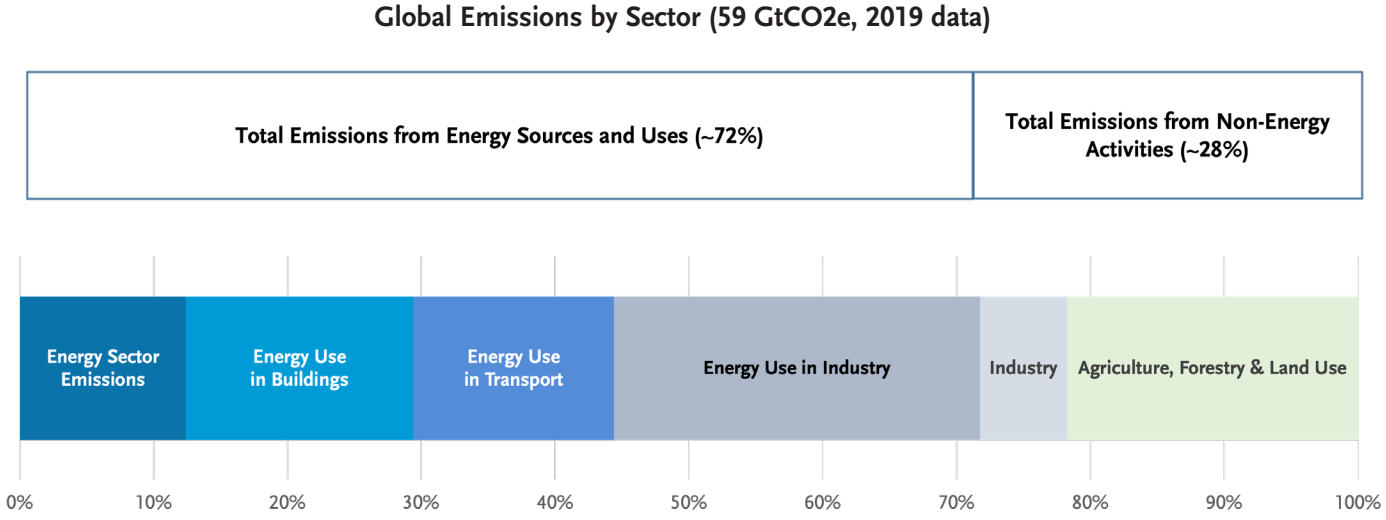
A centerpiece of the transition to a low carbon economy is the transformation of energy production and utilization systems from their reliance on fossil fuels to more sustainable alternatives. The existing system involves a global network of energy infrastructure (e.g., pipelines and storage), transportation (e.g., trains, trucks, and ships), and transformation assets (e.g., refiners) to generate electricity, heat, or power mechanical or chemical processes. Globally, energy systems are responsible for approximately three quarters of greenhouse gas (GHG) emissions.

**Energy systems can be transformed in two ways:**

1. **Electrification:** This approach involves powering all actions through electricity generated from lower-carbon sources such as solar, wind, and nuclear energy. Investment in batteries and storage technology would be required to manage the intermittent nature of renewables and ensure a stable energy supply. This mode of transformation focuses on replacing fossil fuels with cleaner energy sources to reduce greenhouse gas emissions and mitigate climate change.

2. **Decarbonization of Combustion:** This approach retains the combustion nature of energy conversion but replaces hydrocarbons with hydrogen or alternative fuels, reducing CO2 emissions. Additionally, this method offers the option to capture CO2 and store it underground, effectively reversing the extraction of fossil fuels.

While these two approaches compete with each other, the reality is that a mix of existing and new technologies of both types will likely emerge. The key to a successful energy transition lies in understanding the strengths and weaknesses of each approach and harnessing their synergies to create a more sustainable and resilient energy system.




Source: TCW Analysis, data from Intergovernmental Panel on Climate Change AR6 Synthesis Report

**Investment Opportunity**

To capitalize on the wide array of opportunities related to the energy transition, TCW takes a systems-level approach to mapping the transition investment universe. Our process is agnostic to the pathway taken and allows our investment teams to dynamically position portfolios to be robust across multiple transition scenarios. This approach stems from our house view that the energy transition will be a longer, slower, and more technologically competitive process than implied by aspirational climate goals.[1]

In particular, we acknowledge the critical role that legacy players in high-emitting sectors will have in contributing to global decarbonization efforts. In fact, it is because these industries are high emitting and hard to abate that we highlight them in our assessment of opportunities related to the transition, as they will have the longest and most complex pathways to decarbonization. This complexity means there is a spectrum of company responses to the changing economic landscape. Our analysis of companies along this spectrum reveals the best and worst positioned so we can allocate our investments accordingly.

Investing in high emitters that are actively innovating to reduce their climate impacts will also generate the most meaningful real-world results. Though 73% of transition financing flows to energy (44%) and transport (29%), mitigation and investment potential is ripe across other sectors as well.[2] Investments in end use parts of energy systems, such as real assets and industrial processes, are critical to reducing emissions. In many cases, existing technologies and practices can be leveraged to achieve emissions reduction targets and adopters may see tailwinds through public sector support and increased market demand. For example, the transition opportunity for buildings includes using adequate insulation materials and upgrading HVAC systems to increase energy efficiency. In 2022, heat pump sales grew by 11% globally and by 40% in Europe, where climate policy is stronger.[3] Investing across the full array of possible opportunities avoids crowding capital into well-funded segments of the economy and missing opportunities elsewhere.

Regardless of the transition pathway pursued, transformation of the energy system will involve considerable investment in infrastructure for transmitting and transforming energy. Whether the path is electrification or a mix of alternative fuels like hydrogen and biofuels in conjunction with carbon capture and storage, more infrastructure real assets will be needed. Investments in pipelines, storage facilities, transmission lines, and transformation sites are particularly behind. An estimated 75% of infrastructure needed by 2050 has yet to be built, implying a wave of financing that will ripple throughout affected industries.[4] However, the pace of grid modernization hinges on supportive policies such as carbon pricing, subsidies, and efficiency standards. Anticipated capital investments will stimulate demand for parts, control systems, design, and construction, expanding the potential transition investment universe to suppliers of those parts and providers of construction and engineering solutions.

### TCW's Transition Opportunity Assessment Framework

TCW's Sustainable Investment Group poses four high-level questions to ensure we prioritize transition investments that provide sector diversification as well as opportunity for real economy decarbonization. The questions form the basis of our transition universe creation process. They begin at the industry level and narrow to the company level to guide the selection process.

### Transition Universe Qualification Questions

#### Industry-Level

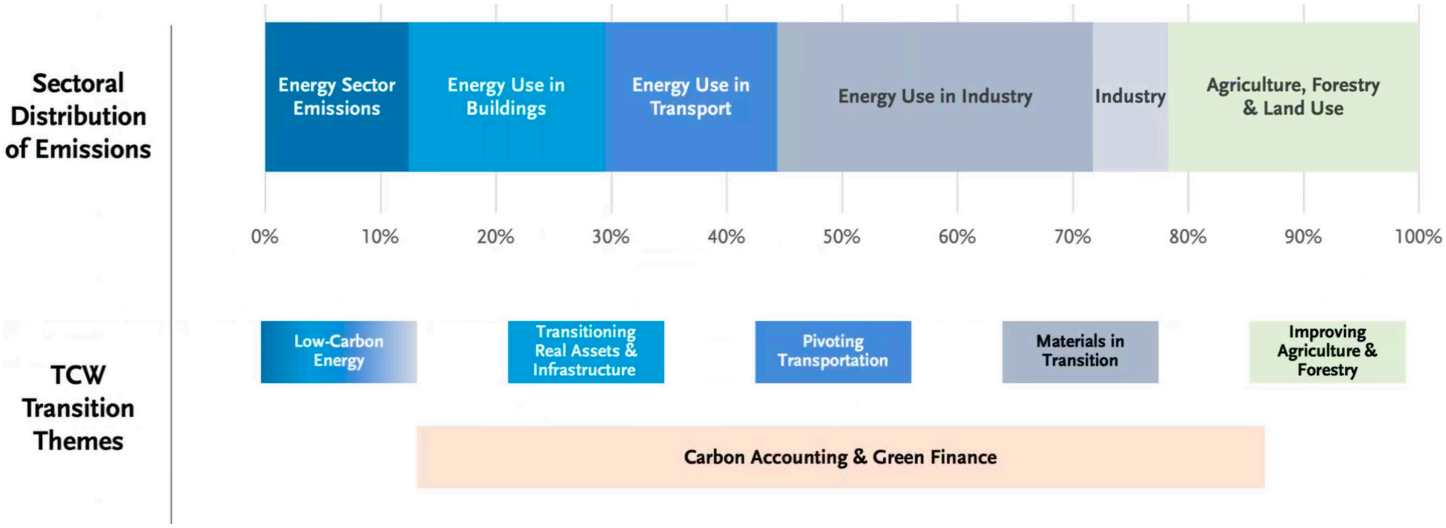
1. Is this industry relevant to the transition?
2. What role does this industry play in the transition?

#### Company-Level

3. Does this company demonstrate contribution to the transition?
4. How is this company contributing to the transition?

We categorize companies whose fundamentals support our transition investment thesis into six proprietary themes. These themes reflect the key sources of global emissions.

**2019 Global Emissions by Sector and TCW Transition Themes**




Source: TCW Analysis, data from Intergovernmental Panel on Climate Change AR6 Synthesis Report

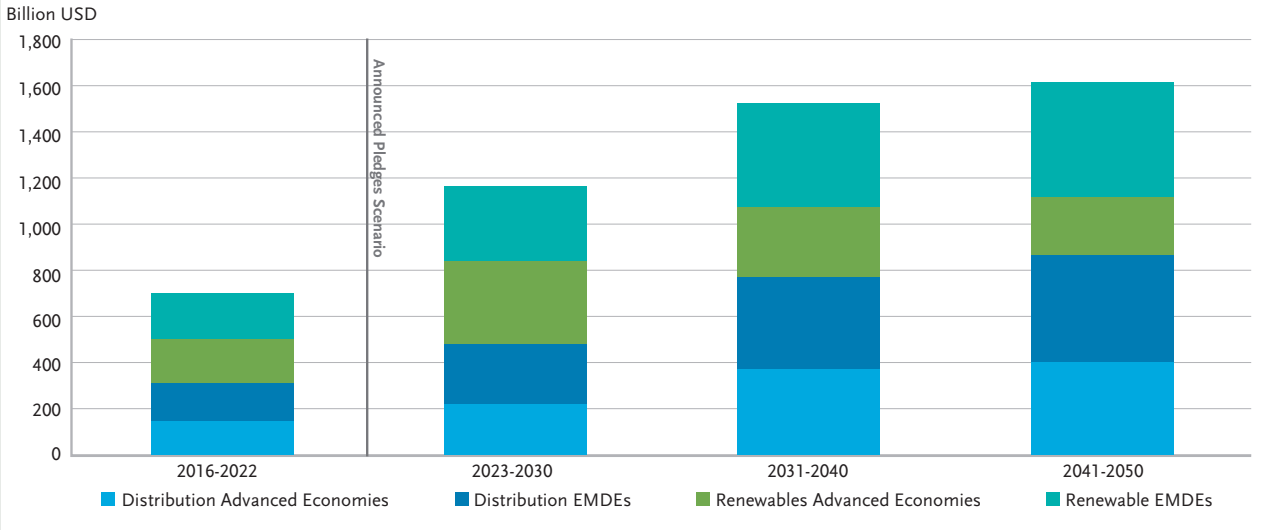
In addition to targeting the primary sources of global GHG emissions, we also consider opportunities presented by supply chains relevant to new technologies needed for decarbonization. We distinguish between businesses that are actively decarbonizing and those that are providing products or services critical to lowering emissions. We define ***improvers*** as companies with business models traditionally tied to carbon emissions that have taken credible steps to decouple their carbon footprints from financial performance and ***enablers*** as companies whose products or services are critical inputs to initiate, accelerate, and/or scale the decarbonization of the economy. Framing the investable universe in this manner helps us to consider the full ecosystem at play.

## Spotlight on Electrification

Industries across the U.S. are turning to electrification to automate processes and become more efficient. At the same time, a resurgence of domestic manufacturing and growing demand for data centers are contributing to the first increase in electricity demand in the U.S. in more than 15 years.[5] This surge in demand is straining America's fragile electric grid, which is also increasingly vulnerable to severe weather events due to its aging and neglected infrastructure.[6] This phenomenon is not unique to the U.S. In 2023, the International Energy Agency (IEA) predicted that 80 million km of grid – an amount equal to the entire global electric grid – would need to be added or refurbished by 2040 to meet national climate targets.[7]

As a result, governments are investing in grid modernization projects at levels unseen in generations. Last year, the U.S. government announced a $3.5 billion investment in the country's electric grid, the largest ever in the grid's history.[8] Globally, countries across developed and emerging economies have pledged billions of dollars in investments into renewable energy and electricity distribution over the next several decades.

**Average Annual Investment in Grids and Renewables by Regional Grouping in the Announced Pledges Scenario, 2011-2050**




Source: IEA

## Spotlight on Electrification cont'd

These conditions highlight a long-term investment thesis related to electrification. Public sector support is growing for energy and utilities companies to improve their resilience and reliability and for the lowering of emissions across all sectors of the economy. Second and third order beneficiaries of this trend include companies producing inputs key to grid modernization – the ***enablers*** of electrification. These include manufacturers of battery storage and electrical equipment, as well as providers of engineering, communication, and monitoring services. Advanced sensor producers and software companies that make smart metering technologies will also see demand for their products increase.

Downstream, users of electricity will likewise play a role in the build out of reliable and clean electricity generation and distribution by taking steps to reduce their aggregate impact on the grid. Large users of electricity, such as data centers and industrial factories that make efforts to improve their energy efficiency, reduce the risk of outages. For as long as demand exceeds the ability for current infrastructure to generate, transmit, and distribute electricity, energy efficiency improvements will be critical to maintain grid reliability. ***Improvers*** that are actively reducing their energy intensity help to mitigate systemic risk from power outages and may see benefits related to decreased electricity costs.

Adopting this ecosystem perspective helps us identify opportunities to capitalize on trends, such as electrification, that will have cross-sector ramifications. The transition involves a full-economy transformation, introducing brand new industries as well as re-imaginations of existing industries. Such transformations require an unprecedented mobilization of capital. Prudent investors, like TCW, are equipped to capitalize on this dynamism to generate returns for their clients while advancing climate-positive solutions. ■

## Footnote References

1. See previous TCW writing on this topic here and here.
2. Climate Policy Initiative. Link.
3. IEA. Link.
4. PWC. Link.
5. New York Times. Link.
6. See here for TCW's views on the state of the U.S. electric grid.
7. IEA (2023), Electricity Grids and Secure Energy Transitions, IEA, Paris. Link.
8. Energy.gov. Link.

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Dr. Đogo is the Head of Quantitative Research at TCW. In this role, he leads the firm's cross-asset quantitative research and investing efforts. At TCW, he has also co-headed TCW's Sustainable Investment Group. Prior to joining TCW, he was an Executive Director at Morgan Stanley, where he delivered quantitative investment solutions to the firm's clients across all asset classes. Earlier in his career he was an economist at the World Bank working in the central economic policy department, on the staff of the global chief economist, and in the environment and natural resources group. He has served on the professional staff of the U.S. Senate Committee on Finance and was a policy analyst at the RAND Corporation. A graduate of the United States Air Force Academy and a former military officer, he also holds master's degrees in applied physics and defense analysis from the Naval Postgraduate School, and a doctorate in policy analysis from the Pardee RAND Graduate School.

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Mr. Horton is a Senior Portfolio Manager of TCW's active equity ETF investments and is a Portfolio Manager of the TCW New America Premier Equities strategy. His investment career has spanned both public and private markets across a variety of sectors. He joined TCW as part of TCW's acquisition of Engine No. 1. Prior to Engine No. 1, Mr. Horton was a Managing Director at Maverick Capital, a long-short investment firm where he invested in industrials and a broad range of industries. Previously, he was a member of the Technology and Retail private equity teams at KKR. He began his career in the Technology, Media & Telecom group within the investment banking division of Goldman Sachs. Mr. Horton received a BS in Accounting and a Master of Accountancy from the Marriott School of Business at Brigham Young University.

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