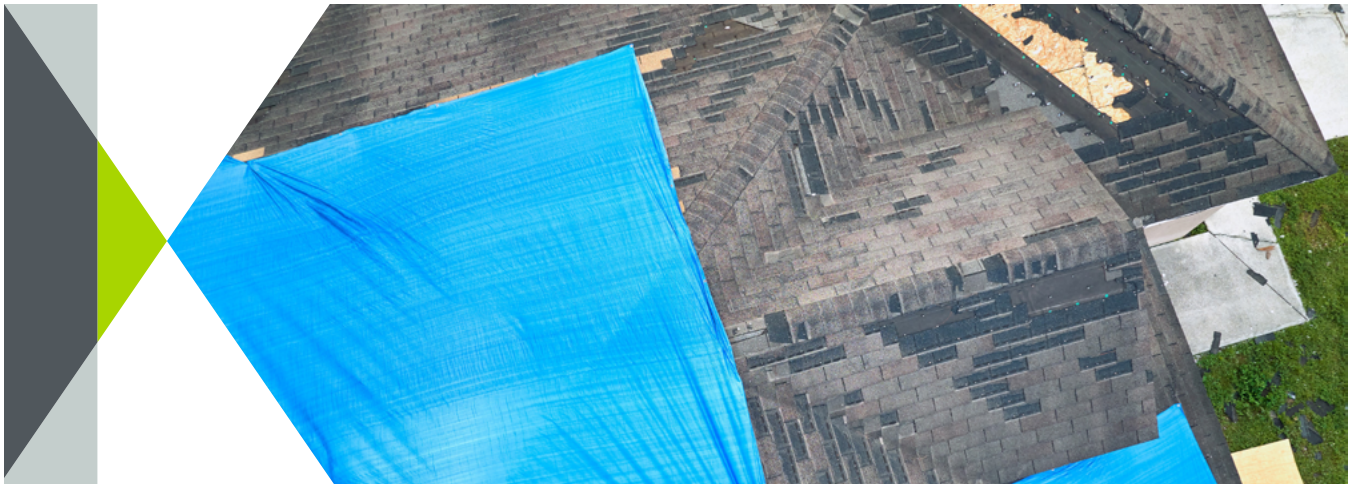


EXECUTIVE INSIGHTS

A WISE Approach to Weather-Related Services Demand

While the number of severe weather events in the U.S. has remained fairly consistent over the past 20 years at around 32,000 events annually, there can be significant variability[1] (e.g., there were around 38,000 events in 2023), and the average cost of each event has risen.

It's why providers of residential services along with building and construction companies, and their respective investors, need a way to better understand weather demand in the context of other demand drivers such as the macroeconomy and construction activity.

To that end, L.E.K. Consulting has developed the Weather Index for Service Essentials, or WISE, which comprises indices of heat/cold days and of extreme weather events that we've used to develop insights into building services categories, specifically heating, ventilation and air conditioning (HVAC) and roofing. WISE is an effective tool that allows us to forecast future demand.

The impacts of extreme weather

Extreme weather impacts a number of building products and residential services, each in unique ways.

HVAC

- Extreme temperatures negatively impact how HVAC systems operate, increasing system strain
- During periods of increased heat or cold, the number of HVAC repair calls rises

Roofing

- Hail and high winds can cause severe damage to roofs
- Extreme temperatures weaken adhesives and loosen roofing
- The number of roofing service calls increases immediately after major storms, as does the number of trade-ups and requests for hurricane-proof offerings

Flooring

- Flooding can cause flooring to warp or buckle, though the impact may vary by flooring material
- Flooring repair requests spike immediately after major flooding, and complete reinstallation is sometimes required

Electrical

- High winds, tornadoes and hurricanes can cause public infrastructure damage (e.g., downed power lines, energy surges) resulting in both volatile access to power and residential damage
- Electrical services requests are often made during storms, with requests for major repairs continuing on in the months following

Plumbing

- Flooding and extreme cold may cause pipes to shift or burst
- Building owners/homeowners are more likely to place plumbing repair calls immediately following storms
- Burst pipes can highlight additional plumbing repair needs that would otherwise remain invisible

Siding

- Siding on building exteriors can be negatively impacted by high winds and debris from extreme storms (e.g., hurricanes, tornadoes, cyclones)
- Like roofing, siding is a critical element of external infrastructure; depending on the severity of damage, repairs may start in the months immediately following a storm

Fencing

- Fencing can be damaged by falling trees and flying debris that are the result of extreme storms and high winds
- Repair and replacement services for fencing may be viewed as less critical than for other components, so might not take place for weeks or months following a storm

WISE overview

While demand for residential services such as HVAC and roofing is driven by a variety of factors, looking at the historical data clarifies to what extent changes in weather have impacted broader weather trends — and by extension, that demand — over time.

With our WISE index, "degree days" (measures of how warm or cold a particular location is) are calculated by measuring the difference between the daily mean temperature and 65°F (the typical baseline for no heating or cooling needed).

Cooling days are recorded when temperatures surpass 65°F; if the daily mean temperature reaches 80°F, for example, that equates to 15 cooling degree days. Heating days, on the other hand, occur when the temperature is below 65°F; if the temperature mean is 50°F on a given day, the result is 15 heating degree days.

The WISE index also examines the change in the number of extreme weather events that can influence demand for roofing, among other categories.

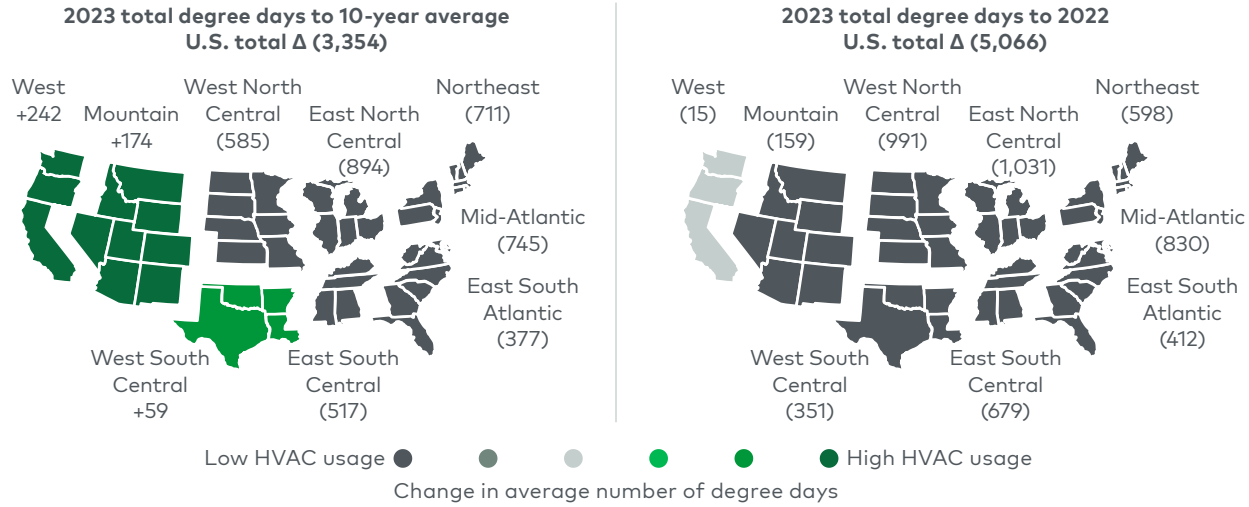
What the WISE index reveals

From the third quarter of 2022 to the third quarter of 2023, there was a notable increase in the number of times roofing-focused public companies referenced severe weather on their earnings calls. But whereas the roofing industry enjoyed higher shipments overall as a result of weather during that time frame, HVAC shipments fell in 2023.

Indeed, in 2023, the U.S. experienced fewer cooling and heating days compared with both the prior year (9%) and the 10-year average (6%), which was attributed to a cooler summer and a milder winter. Compared with the long-term average, the East Coast and the Midwest had fewer heating/cooling days, which implies relatively low HVAC usage. Conversely, there were relatively more heating/cooling days than the long-term average in the U.S. West and Southwest, leading to increased HVAC usage.

Meanwhile, compared with 2022, all regions of the U.S. experienced fewer heating/cooling days, which was attributed to a cooler summer and a milder winter and which led to a decrease in degree days and in HVAC usage (see Figure 1).

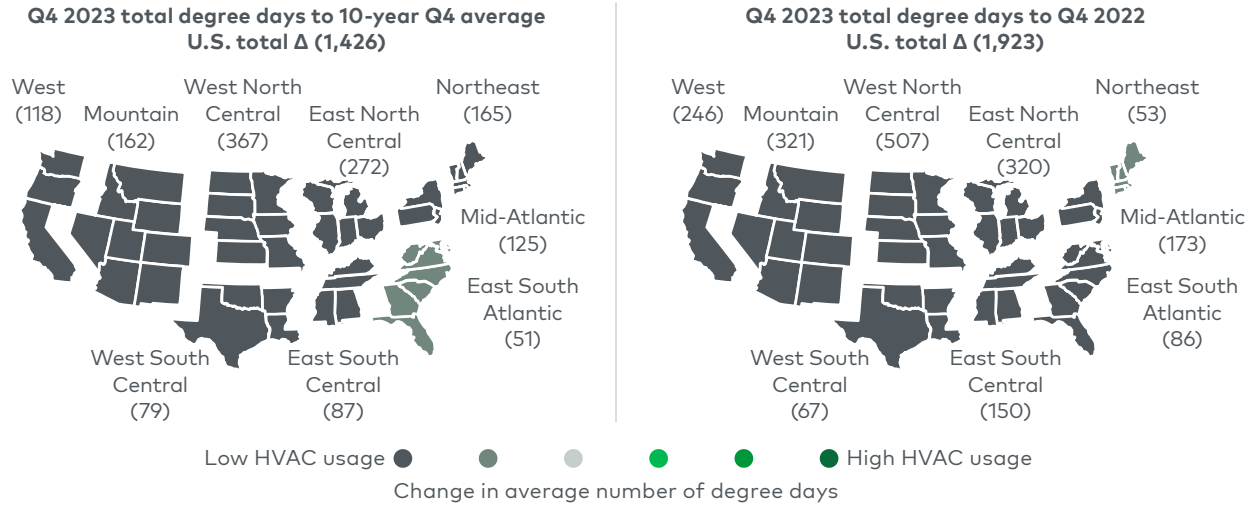
Figure 1
Regional comparison of total degree days (2023)



Note: HVAC=heating, ventilation and air conditioning
Source: U.S. Energy Information Administration; L.E.K. research and analysis

In the fourth quarter of 2023, overall HVAC usage was lower compared with the 10-year average (9%), as the warmer-than-average winter led to a lower-than-average number of heating days and a decrease in HVAC usage. The milder winter compared with the fourth quarter of 2022 (12%) resulted in significantly fewer heating days, which drove a decrease in HVAC usage quarter over quarter (see Figure 2).

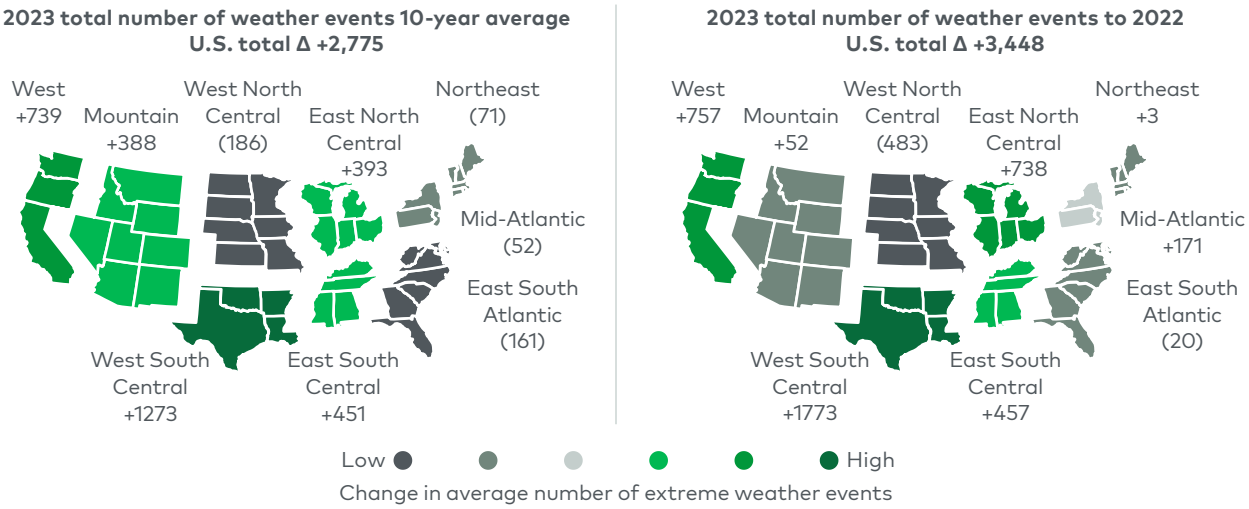
Figure 2
Regional comparison of total degree days (Q4 2023)



Note: HVAC=heating, ventilation and air conditioning
Source: U.S. Energy Information Administration; L.E.K. research and analysis

When it comes to roofing, in 2023 the number of extreme weather events (e.g., blizzards, floods, high winds, hurricanes/typhoons, strong winds, tornadoes, tsunamis) was higher than the prior 10-year average in the West, East North Central and West South Central regions, which drove higher demand. The East experienced a similar amount of extreme weather events compared with 2022, whereas the South and the West experienced a higher number of such events. Across the U.S., the number of significant weather events surged 20% between 2022 and 2023 (see Figure 3).

Figure 3
Regional comparison of total number of weather events (2023)



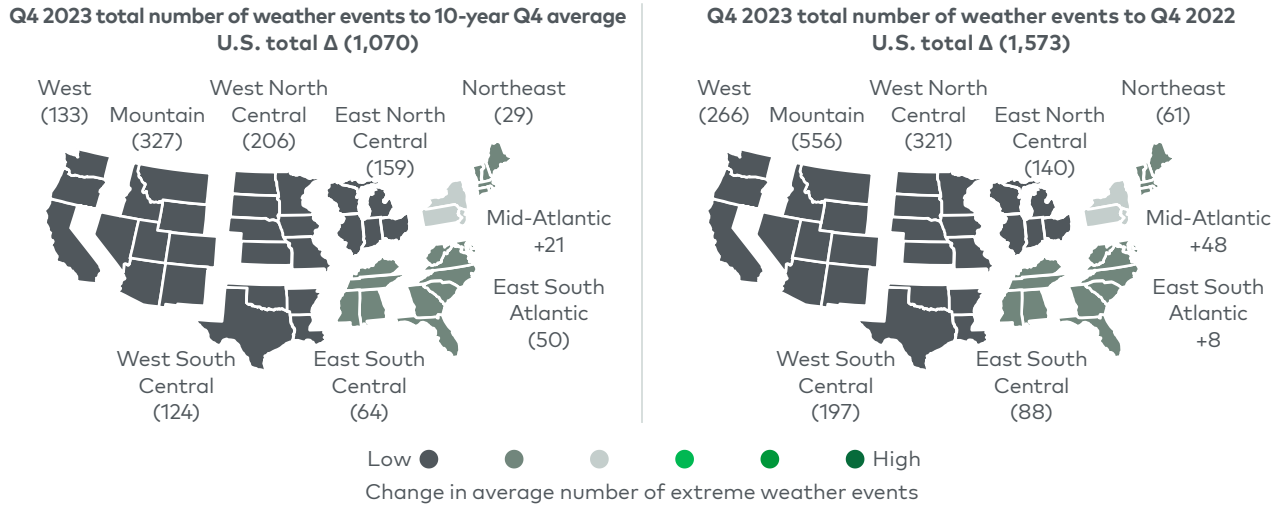
Source: U.S. Energy Information Administration; L.E.K. research and analysis

That was not, however, the case in the fourth quarter of 2023.

The East experienced a number of extreme weather events that was more comparable to 2022, resulting in a roofing purchase pattern similar to that of previous quarters. For the U.S. as a whole, the number of extreme weather events was lower compared with both the previous year (49%) and the 10-year average (39%), driven by milder weather in the Midwest and the West (see Figure 4).

Figure 4

Regional comparison of total number of weather events (Q4 2023)



Source: U.S. Energy Information Administration; L.E.K. research and analysis

Extreme weather has a positive short-term impact on roofing, but there are some indications this demand has a negative impact two quarters later.

L.E.K.'s regression analysis on the impact of the number of weather events on roofing demand was statistically significant. It indicates that the number of weather events in a given quarter is expected to lead to an increase in the number of roofing shipments in the same quarter, but expected to lead to a decline of larger magnitude in the number of roofing shipments two quarters later.

L.E.K.'s regression analysis on the impact of the number of degree days on HVAC shipments was likewise statistically significant. It indicates that the number of degree days in a given quarter is expected to lead to an increase in the number of HVAC shipments in the following quarter.

A WISE approach

As the instances of extreme weather events — and their cost — continue to increase each year, the ability to predict demand is among the most crucial tools that providers of HVAC and roofing services, and their investors, can have in their respective toolboxes. With the WISE index, they can better understand building product performance and the potential directional impact of weather on demand.

Thank you to Saif Nuzral for contributing to this edition of *Executive Insights*.

For more information, please contact strategy@lek.com.

Endnote

[1]NOAA.gov, "Annual 2023 Global Climate Report." https://www.ncei.noaa.gov/access/monitoring/monthly-report/global/202313

About the Authors

Paul Bromfield
Paul Bromfield is a Managing Director and Partner in L.E.K. Consulting's New York office and is focused on the building & construction and industrial distribution sectors within the firm's Industrials practice. Paul has more than 20 years of experience, with a strong record of helping companies across the value chain accelerate growth, including service innovation, multichannel strategy and M&A. He brings particular expertise in commercial sectors, exterior products, organizational implementation and how companies can adapt to sustainability.

Gavin McGrath
Gavin McGrath is a Managing Director and Partner based in L.E.K. Consulting's Boston office and a leader in the firm's Industrials and Digital practices in the Americas region. Gavin's experience includes digital products and business models, digital customer experience and ecommerce, the Internet of Things and Industry 4.0, digital ways of working, and digital readiness. He has a particular focus on building products, residential and commercial construction, and the built environment ecosystem.

Corey Highfield
Corey Highfield is a Managing Director and Partner in L.E.K. Consulting's Boston office and a member of the firm's Industrials practice as well as a collaborator with the firm's Digital practice. With a focus on the building and construction industry, Corey supports corporate and private equity clients across projects focused on growth strategy, market assessments, M&A and digital strategy.

Ryan Moore
Ryan Moore is an Engagement Manager in L.E.K. Consulting's Boston office and is a member of the firm's Digital and Industrials practices. Ryan has experience in digital strategy across various areas, including digital commerce, customer engagement and disruptive new business models. He has a particular focus on building products and residential and commercial services.

About L.E.K. Consulting
We're L.E.K. Consulting, a global strategy consultancy working with business leaders to seize competitive advantage and amplify growth. Our insights are catalysts that reshape the trajectory of our clients' businesses, uncovering opportunities and empowering them to master their moments of truth. Since 1983, our worldwide practice — spanning the Americas, Asia-Pacific and Europe — has guided leaders across all industries, from global corporations to emerging entrepreneurial businesses and private equity investors. Looking for more? Visit **www.lek.com**.