

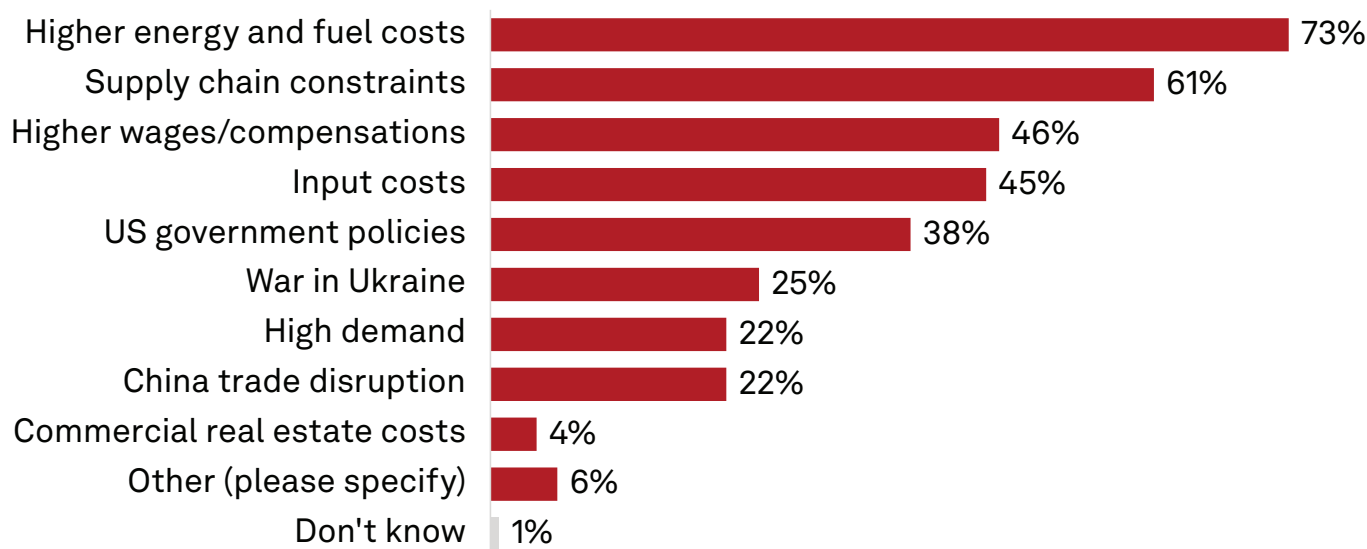
Gaining a Competitive Edge With Digital Solutions for Energy



The 451 Take

Companies today face enormous challenges to reduce energy costs and decarbonize their operations to achieve business resilience and sustainability. The geopolitical risks and volatility of energy markets exacerbate this challenge. According to a recent 451 Research Voice of the Customer: Macroeconomic Outlook survey, high energy and fuel costs have been the number one cause of rising production prices within organizations (see figure). Thus, energy efficiency gains have significant impact on the bottom line at businesses worldwide. To exploit this potential, companies must focus on energy efficiency measures, including analyzing energy consumption patterns, implementing energy management systems, and optimizing their operations and energy usage.

Drivers of rising prices for production and services



Q: Which of the following do you think are the primary causes of rising prices of production and services at your organization? (Check all that apply).

Base: All respondents (n=261).

Source: 451 Research's Voice of the Customer: Macroeconomic Outlook, Business Trends, ESG 2022.

Energy system flexibility is increasingly important to reduce costs and improve sustainability and resilience. The more an organization is able to adapt its electricity consumption to fluctuating renewable generation, the more it is able to benefit from low-price hours, and the higher its share of renewable electricity will be.

These goals can be achieved faster using new digital technologies such as advanced analytics and automation, and improved monitoring and control systems. Investing in these technologies and implementing energy efficiency measures can help companies stay in business today, but also provide a long-term value in terms of meeting sustainability and decarbonization targets and increasing competitiveness. By getting ahead of the competition in terms of energy efficiency, resilience and sustainability, companies can position themselves for success in a post-crisis market.

Business Impact

There are many digital solutions — IoT sensors, cloud analytics, artificial intelligence and machine learning (AI/ML), digital twins, and anything-as-a-service (XaaS) — that support enterprise efforts to drive energy efficiency and business resilience. The main challenge is deciding on the most effective strategies and how to begin. Beyond individual technologies, business leaders require comprehensive solutions to support end-to-end sustainability programs.

These are some of the most effective solutions for energy efficiency, flexibility, sustainability and business resilience:

- **Create transparency.** Building on IoT-enabled sensors and devices, energy management software can help companies track their energy consumption in real-time, providing valuable insights about where energy is wasted. Advanced analytics and machine-learning algorithms can be used to process large volumes of data, such as energy usage data, to identify patterns that may be invisible to the human eye. Additionally, companies can implement automated reporting systems to ensure that energy usage data is accurate and up-to-date, and that it is easily accessible to relevant stakeholders. Aggregated in a virtual model, such as a digital twin, companies can simulate the performance of their systems under different operating conditions.
- **Improve operations.** Maximum transparency enables companies to manage design, operation and maintenance, and ultimately to reduce operational energy costs. A digital twin, for example, can use real-life data from factories or buildings to optimize ongoing operations — e.g., by identifying times of day when energy demand is highest and adjusting usage patterns accordingly. Data-driven asset management can, for example, create up to 30% energy savings in buildings and reduce maintenance by 30% while delivering a 45% reduction in equipment downtime. According to a recent 451 Research study, 32.6% of enterprises aim to implement digital twin technology to support real-time operations and maintenance.
- **Manage energy supply.** Digital solutions such as intelligent on-site energy supply, sustainable electricity generation and storage solutions, energy management and microgrid control, and electric vehicle (EV) charging and virtual power plants can help companies achieve their decarbonization goals. These technologies not only help reduce carbon emissions but also provide cost savings in the long run. Companies can also implement energy management software to improve the efficiency and reliability of their energy systems. Low-carbon blockchain solutions further enable companies to monitor energy consumption and CO2 emissions along their entire supply chain.

Like all transformative efforts, digital transformation to support ambitious energy goals isn't easy. It is a complex process that requires a holistic approach to integrate IT and OT systems, ensure interoperability, and find flexible solutions for specific needs. To simplify and accelerate transformation, enterprises should tap into existing ecosystems and marketplaces, which offer a variety of solutions, partners and services. Building strong partner networks brings many benefits, including access to multiple options, the latest expertise and the development of new business models.

Furthermore, using energy-as-a-service (EaaS) models can provide businesses with access to future-proof technologies without upfront costs for facilities upgrades, while also driving long-term energy and cost savings. This approach can enable speed and scale in the urgent mission for energy efficiency.

Looking Ahead

With energy costs on the rise, the ongoing challenge to decarbonize businesses and the likelihood of the energy crisis persisting beyond the winter of 2023-24, it's becoming increasingly clear that energy will remain a critical concern for businesses for years to come. Yet according to a recent macroeconomic study by 451 Research, only 34% of business leaders have identified energy efficiency as a key performance indicator for 2023. And only 24% of executives plan to implement energy management solutions to reduce emissions and energy consumption over the next two years.

Business leaders taking a proactive approach can differentiate themselves from the competition, with a view to sustainable growth later on. After all, digital solutions will enable long-term sustainable growth by reducing energy costs, drive down carbon emissions and ensure energy resilience — reducing the risk of outages or fluctuations in supply that could be critical to operations and competitiveness.

The emergence of the industrial metaverse — a virtual world in which businesses can collaborate in real-time — will also play a crucial role in helping companies create more sustainable and efficient production, products and services.

SIEMENS

To make your transformation for greater energy efficiency, resilience and sustainability faster and easier, you can leverage [Siemens Xcelerator](#). The open digital business platform offers proven industry-specific solutions, and a curated, modular and interoperable portfolio of hardware and software that is IoT-enabled and designed for seamless integration. Many solutions are offered as-a-service, helping to enhance resilience and predictability as businesses grow. The digital solutions of Siemens Xcelerator can be key to your company's success, because they are easier, faster and more scalable to implement.

