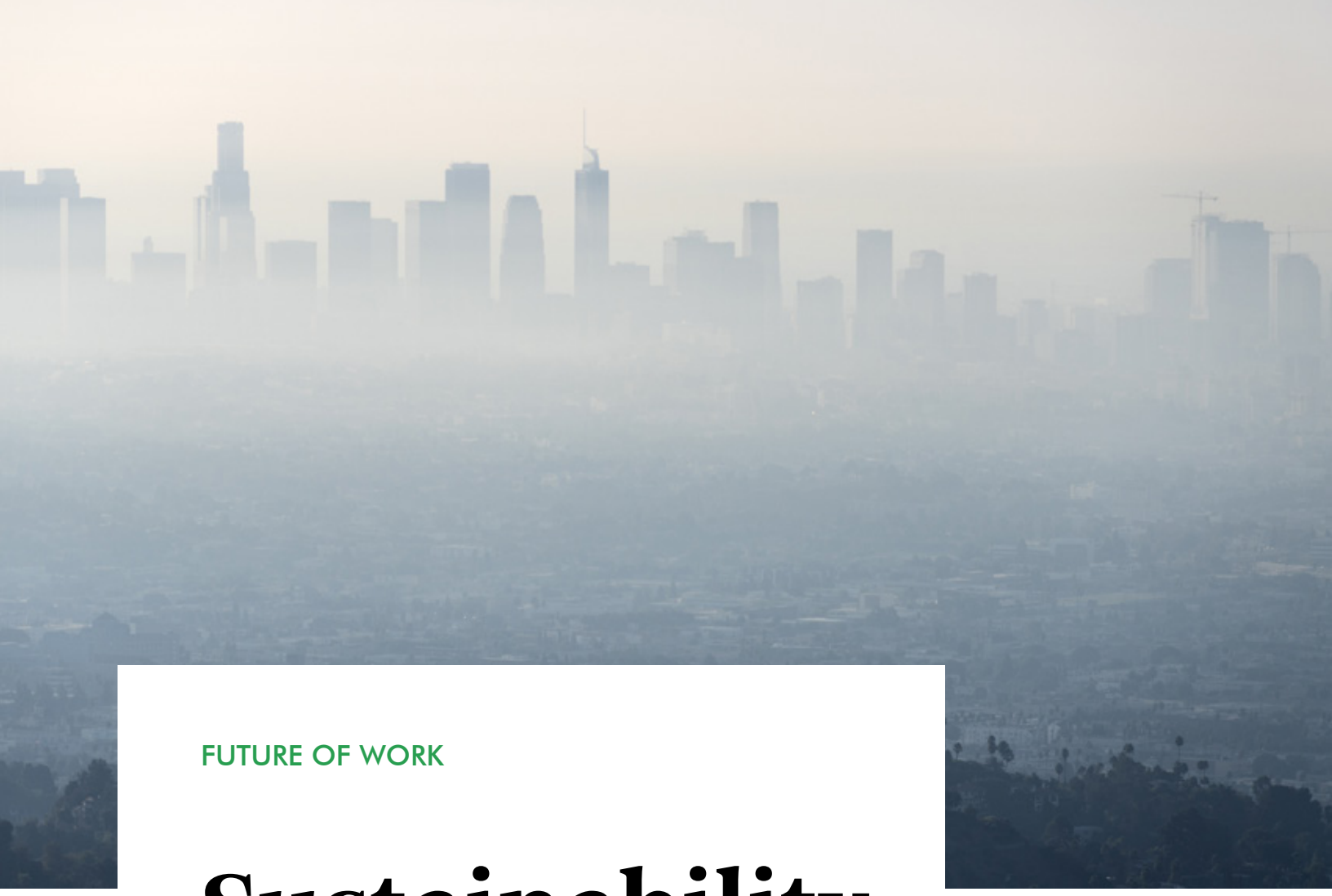

FUTURE OF WORK

Sustainability Starts with Energy Management

By John Hagen

CBRE

In recent years, many companies have worked to cut costs and reduce their environmental footprints. Now, with research showing that the physical risk from climate change will continue to accelerate unless the world achieves net-zero emissions by 2050, no business can afford to hesitate on the path toward this mission-critical ESG goal. Every journey along that path must begin by addressing Scope 1 and 2 emissions, both of which a company can take steps to eliminate through its own direct actions related to energy management.

Scope 1 emissions originate from facilities or equipment that your company owns or controls. Scope 2 emissions consist of indirect emissions from the generation of purchased energy. Given the urgency of the Paris Agreement's international mandate to limit the mean rise in global temperature to less than 2°C above pre-industrial levels, Scope 1 and Scope 2 emissions represent quick-win opportunities for decarbonization through best-in-class energy management. At the same time, Scope 3 emissions—emissions resulting from the full supply chain—must undergo mitigation and eventual elimination via the implementation of a robust, holistic sustainability policy integrated across a company's entire footprint.

To put it simply, a better future must start with energy management.

Everything Begins with Energy

The economy today remains carbon-intensive and must transition rapidly—a transition that takes energy use and generation as its starting point. Commercial real estate leaders understand the risk, given that the built environment accounted for 40% of global energy use and 33% of global energy-related CO_2 emissions in 2019. CBRE's partners understand it as well, with more than a third of our top 75 enterprise occupier clients having announced science-based plans to achieve those targets.

The right approach to energy can differentiate a company from its peers—an approach that must encompass cutting-edge asset management, building systems monitoring and energy procurement. In addition to supporting the energy and sustainability goals of our clients, CBRE values this holistic approach, having announced its own science-based target in 2020, committing to a 79% reduction in occupier emissions by 2035, achieving 100% renewable energy by 2025 and transitioning its vehicle fleet to electric vehicles.

Lessons from the Pandemic: Investment in Energy-Saving Infrastructure Pays Off

Unfortunately, energy reduction efforts of all kinds encountered a major obstacle in 2020, as the COVID-19 pandemic necessitated urgent and not always eco-friendly changes to energy management procedures. Companies had to develop a better understanding of air quality's role as a critical component of employee well-being, productivity and safety. This meant that energy efficiency and savings goals needed to account both for the fresh-air requirements of employees as well as the increased costs imposed by those needs.

Fortunately, advances in energy technology had already enabled companies to curtail energy use prior to the pandemic, thereby cushioning the blow of cost increases resulting from the intake of more fresh air.

Joseph Gomez, CBRE | ESI Smart Buildings Business Leader for the EMEA region, assessed the impact of those cost-saving technological innovations.

"The past few years have seen the emergence of several strong drivers for cost reduction: decarbonization of utilities procured and used, decentralization of local energy needs where off-grid solutions are viable, and improved technology supporting automated fault detection and diagnostics to resolve building services anomalies efficiently,"

Gomez explains, emphasizing that these investments can achieve savings capable of offsetting the impact of other unexpected business disruptions.

The Road to Net Zero

CBRE directly manages

$1.4B

in client utility spend for

55

enterprise accounts via Energy and Sustainability programs that span

8,000+

locations

Together, these innovations point the way toward net-zero carbon emissions. But without a clear plan, piecemeal investments even in the latest innovations may fail to yield optimal results.

"Everything here depends on your methodology, which is why we've spent so much time refining ours," says Patrick Johanning, Senior Managing Director of CBRE's Asset Performance and Energy Excellence Services (APEX) group. "We follow a phased approach to reaching net zero. Although solutions vary by size and scope of the client, this typically has our energy team addressing utility bill payment and procurement in phase one, building management and automation systems as well as central utility plant upgrades in phase two, on-site renewable energy installations and smart building deployments in phase three, and finally continuous improvement and remote command-and-control of all facilities after we've achieved net zero during phase four."

CBRE directly manages $1.4 billion in client utility spend for 55 enterprise accounts via Energy and Sustainability programs that span 8,000-plus locations.[1] This process results in significant emissions reduction and energy savings.

"Since 2017, we've tracked more than $398 million in energy cost savings for 60-plus enterprise accounts in North America[2] specifically and measured 1.5 billion pounds (680k metric tons) of CO2 emission reductions across an average of 660MSF[3]," says John Hagen, CBRE's Global Senior Managing Director for Asset Performance and Energy Excellence Services. "In 2020 alone, we tracked more than $125 million in energy cost savings[4] just for enterprise accounts in North America and measured 368 million pounds (167k metric tons) of CO_2 emission reductions across 531 million square feet[5]."

[1]CBRE Bill Pay Analytics, 2021.
[2,3,4,5]CBRE Asset Performance and Energy Excellence Group, 2021.

Asset Data Collection and Improved Asset Performance

Facilities management costs associated with "controllable" utility outlays and operating expenses tied to repair and maintenance generally constitute only a small portion of actual facilities spend, obscuring typically higher hidden costs such as emergency capital expenditures, variance in energy pricing, excessive reactive maintenance and carbon emissions.

Put simply, methodically addressing asset total cost of ownership (ATCO) creates a future of increased performance and uptime along with decreased emissions and capital spend. An asset performance program like APEX gathers client asset data, which in many cases does not exist in a cohesive format. Then, using the data-driven insights derived from a technology platform like Asset Insight, the APEX team can work with the client to develop an understanding of asset replacement costs and engage in accurate short- and long-term capital forecasting.

The average age of a commercial real estate building in the U.S. is 53 years, with capital sometimes lacking to fund the infrastructure upgrades needed to meet sustainability initiatives. Deferred asset replacements can increase OPEX and CAPEX costs by as much as 400% to 1500%. Assets operating beyond their useful life use 30-50% more energy and emissions than new assets.[6]

"One of the looming challenges in the built environment has to do with an increasing number of building assets, such as HVAC systems, nearing or exceeding the end of their useful lives," says John Hagen. "Replacement deficits accumulate as these assets age, leading to much higher future expenses when the assets fail. All failures of equipment negatively impact operations, and some can halt operations."

After building an accurate asset data set and developing benchmarks appropriate for the program, asset replacement can begin. Making strategic investments at this stage can change the game for clients, providing the impetus to reach net zero.

CBRE's Efficiency-as-a-Service (EaaS) program has funded $117 million representing 559 client projects[7] over the past three years, upgrading or introducing roof-top HVAC unit (RTU) replacements, BMS controls, Smart irrigation systems and more.

[6]CBRE's Capital Planning Partner: R&K Solutions, 2021.
[7]CBRE Redaptive, 2021.

Building Automation Systems and Smart Buildings Put Energy Excellence into Practice

Connecting, metering and monitoring all major systems can achieve immediate reductions in reactive maintenance costs and increases in energy efficiency. CBRE recently collaborated with a major online retailer to integrate sustainable technologies and processes into the retailer's major facilities expansion. Site-by-site measurement and verification showed that the system achieved a **consistent reduction in utility consumption of over 20%**[8]. Using data management and Smart building technology, CBRE helped this retail client reduce utility consumption and improve cost and energy efficiencies, while also fostering sustained improvements in the employee work environment related to lighting and air quality.

Improving energy management can happen beyond the retail space. For a Canadian government agency with a portfolio encompassing 20 million square feet, CBRE developed a building automation systems (BAS) solution that monitors 120,000 analytic data points and 20,000 alarm systems. The BAS solution accomplished millions of dollars in annual energy savings by detecting and repairing "phantom loads" on the agency's energy grid, **while also remotely resolving asset issues more than 40% of the time**[9].

In both instances, CBRE ensured that asset investment decisions led to a single point of continuous improvement: the optimization of energy reduction and cost savings.

We've also forged a partnership with Altus Power, which can help our clients execute solar power and other clean energy solutions as the world transitions to a low-carbon economy. Altus Power will become a public company later this year through a business combination with a Special Purpose Acquisition Company (SPAC) sponsored by CBRE.

[8,9]CBRE ESI, 2021.

Take This with You

Companies recognize that they have an obligation to

invest in a net-zero future

Companies recognize that they have an obligation to invest in a net-zero future. CBRE's energy management programs and technologies deliver client savings across our entire footprint, as we design and build that future for them with a truly integrated, world-class approach.

Addressing Scope 1 and Scope 2 emissions through renewable energy procurement, asset upgrades, building optimizations and even on-site renewable energy generation constitutes a necessary step in the process for all companies striving to achieve net zero.

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All of CBRE's COVID-19 related materials have been developed with information from the World Health Organization, the Centers for Disease Control & Prevention (and similar global organizations), public health experts, industrial hygienists, and global subject matter experts across CBRE and our strategic suppliers. Guidance and requirements from public health and governmental organizations vary by geography and should inform decisions in specific locations. Our materials may not be suitable for application to all facilities or situations.

Ultimately, occupiers and landlords must make and implement their own reopening decisions for their individual stakeholders and facilities. CBRE's guidance is intended to help facilitate those discussions and expedite the implementation of those decisions once made by the client. We make no representations or warranties regarding the accuracy or completeness of these materials. CBRE cannot ensure safety and disclaims all liability arising from use of these materials.