

The New Energy FUTURE



Challenges and Opportunities in Corporate Energy Management

AN EDISON ENERGY INSIGHT

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INTRODUCTION

Making sense of a changing energy landscape

The energy world is changing at an unprecedented pace. Not only are oil prices drawing headlines, but the way large organizations acquire, manage and use electricity and natural gas is dramatically different today than it was ten years ago. And ten years from now, it will likely be different still, as technological, regulatory and business model innovations continue to yield new opportunities for energy management. So how will we power the world of tomorrow? What kinds of business models will prevail? It's difficult, if not impossible, to predict the market of the future. Projections about technological adoption are notoriously bad—the explosive growth in the market for solar energy, for instance, far exceeded the projections of both industry analysts and activists¹.

¹ See, for example, Greenpeace 2004 projections of solar energy capacity, which underestimated market growth from 2005-2010 by more than 50%. (Greenpeace Report "The Energy [r]evolution: A Sustainable World Energy Outlook 2012")

INTRODUCTION

At Edison Energy, we wanted to understand how to best serve our customers in the future, so we took a different approach. Rather than looking ahead through the lens of technology and trying to imagine what might be possible, we spent time with the people and organizations that procure, manage and use energy for their operations to understand what would help them achieve their business objectives. We spent more than a year conducting what is perhaps the most comprehensive study ever done on the role of energy in large organizations and the challenges and changes in corporate energy management. Together with our partners from ReD Associates, a strategy consultancy that uses the human sciences to investigate the social underpinnings of changing markets, we met with hundreds of people who have a hand in energy management at large companies and organizations.

We spent time with C-suite executives, energy and facility managers, sustainability professionals, engineers and countless other stakeholders. We walked their facilities and sat in on meetings, all in order to understand the organizations' world-views, practices, challenges and decision-making processes.

How we conducted our research

- » **Met with more than 100 executives and energy managers as part of deep dives with 26 global commercial and industrial companies, ranging from aggressive early adopters to more conservative organizations**
- » **Surveyed executives and energy managers at 542 medium and large US companies from all industries**
- » **Conducted more than 30 expert interviews with a diverse set of vendors, executives, academics, and researchers in the energy industry**
- » **Conducted extensive industry research including a synthesis of more than 50 analyst reports on different energy industry trends**

INTRODUCTION

What we found was a market at a tipping point.

For many organizations, energy represents one of the biggest single line items in their cost base—easily hundreds of millions of dollars, if not billions, for a company in the Fortune 500—and there is an added threat of rising prices and increasing price volatility. Meanwhile, the potential for significant savings on energy is growing rapidly. Emerging technologies like solar, wind, storage, fuel cells, LED lighting systems and building controls, enabled by deeper understandings from new data streams, have become ever more competitive.

Add to that the mounting concerns about sustainability and a constantly changing regulatory landscape, and it's clear why good energy management has become both increasingly important and increasingly complex. Energy is now on the corporate agenda—an emerging headache for C-suite executives who would rather focus on their core business and area of expertise.

Many large organizations have changed how they manage energy, centralizing decision-making and budgets while building internal capabilities. The result is a new generation of empowered energy managers capable of driving company-wide initiatives to improve energy management in ways that would have been impossible to conceive of a decade ago. But while companies are changing in response to this new reality, the industry is lagging behind.



There is little understanding of best practices, limited data on what works, and a lack of transparency regarding the dense network of vendors and service providers that crowd the space.

Most providers lack the capacity to look across geographies and technology areas to identify solutions that make the most sense in a given situation. They take a siloed approach, focusing on what they can provide rather than what customers need, which adds to the already overwhelming complexity facing customers today. As a result, most companies are left with a tremendous unrealized potential for change. A potential which—if unlocked—could usher in a new era of energy management and not only help save money and protect the environment, but also save executives from the energy management headache.

Energy is increasingly an unavoidable concern for top management.

Procuring and managing energy at the world's largest corporations was once pretty simple. In the past, organizations bought energy from a single supplier: the local utility. Energy management was about securing a reliable supply and making energy use more efficient. Despite the often-sizeable cost, it was a relatively low priority on the corporate agenda.

But those days are gone. Among the C-suite executives we met, the consensus is that while it's outside their comfort zone, they can no longer afford to ignore the energy issue. Organizations perceive a significant increase in energy prices and price volatility, and more than half of the companies we surveyed believe those costs will continue to rise. They also

have an increasing awareness of the potential savings and benefits offered by new energy technologies and services. Companies such as Novo Nordisk or Kohl's have shown that proactive investments in renewable energy and energy efficiency can be a source of competitive advantage and significant savings. So while today only about 13% of US commercial and

industrial spending goes toward energy services, distributed generation and other investments outside of utility grid service, the companies surveyed expect that share to more than double—to an average 29% of total energy spend—by 2023.

Eyeing new opportunities

Companies expect that the share of energy coming from distributed generation technologies, off-site renewables and other non-grid technologies will more than double by 2023.

A GROWING HEADACHE

For most large corporations, environmental sustainability is another serious concern. According to the EPA, 469 companies have already moved to 100% renewable energy, and, as a part of the RE100 Initiative, 100 of the world's largest companies have committed to 100% renewable power by 2020. More than 1,000 companies across the globe now put a price on carbon in their internal accounting?² But even as more companies set ambitious sustainability goals, many lack clear plans for meeting them. One energy manager voiced a common issue: "We

Missing the roadmap

"We set this big audacious goal for sustainability and then found ourselves scrambling to find a way to achieve it."

- Energy manager, global financial company

set this big audacious goal for sustainability and then found ourselves scrambling to find a way to achieve it." Even those who initially built sophisticated sustainability strategies are forced to routinely update those plans as the rapid pace of change continues to unlock new opportunities. The sustainability imperative also means that executives from functions traditionally

removed from energy are suddenly paying attention. Success often requires integrating energy strategy with sweeping changes in fields like supply chain, marketing or even corporate culture.

Taking advantage of emerging opportunities is not easy. Many executives and energy managers are understandably wary of unforeseen costs for technologies that have yet to prove themselves in the long term. There are fears that current technologies will grow obsolete before realizing the return on investment. There are even concerns about the impact of new technologies on infrastructure security, reliability and basic safety. As a result, managing and investing in new energy technologies can be a constant source of worry.

² Source: Carbon Disclosure Project

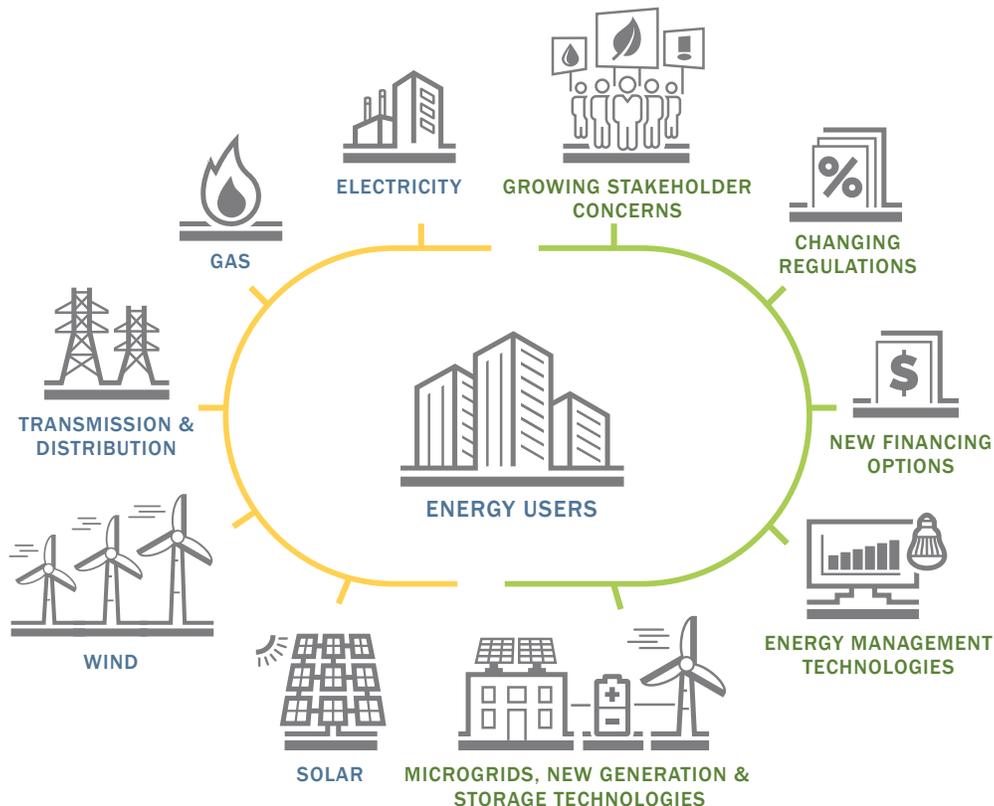
A GROWING HEADACHE

Not only is energy management becoming more important, it is also becoming more complex. Rather than simply plugging into the local utility, today's energy managers must decide if they want to buy energy on the open market or produce it themselves, and if so, how. They must constantly stay abreast of an ever-changing regulatory environment and incentive structure, track greater price and commodity volatility, and analyze increasingly detailed data on their energy consumption and carbon footprint. In 2015 alone, hundreds of new or changed programs and thousands of new or changed tariffs and rate structures were rolled out across US utilities, all of which energy managers in corporations with a national footprint need to track. Big Data, cloud computing, analytics, mobility and the Internet of

Spiraling complexity

In 2015 alone, hundreds of new or changed programs and thousands of new or changed tariffs and rate structures were rolled out across US utilities, all of which an energy manager in a corporation with a national footprint would need to track.

Things have all exploded onto the scene, promising new avenues for savings but adding to the complex array of legacy energy, building, billing and demand management software systems. As prices for technologies like solar and storage continue to drop, energy managers must constantly reevaluate when and where these solutions make sense. They have to deploy more energy-efficient equipment, work with employees to change behaviors, address new compliance issues, compete for capital, and navigate the market of vendors.



A GROWING HEADACHE

Top executives and energy managers alike described the immense learning curve they are facing, and the difficulties of identifying potential pitfalls and “unknown unknowns” as they invest in emerging energy technologies. They often have to consider the specific needs of hundreds of different sites, each with unique utility rates, regulatory setups, weather conditions, business needs and employee behavior, so what works in one location may not work in the next. There’s a lot to do to stay competitive.

The rising complexity of energy management has two important implications. First of all, it leads to mistakes and missed opportunities, because it is nearly impossible for energy managers to stay abreast of all the latest changes and technologies, not to mention a changing vendor

landscape with innovative, if unproven, business models.

The growing complexity also makes it harder for top executives without a

background in engineering or

energy to effectively lead change in the area. A full 45% of companies we surveyed cited a lack of executive interest or understanding as a major barrier to investments in energy. At many companies, energy was described as “invisible”—a cost less tangible and thus less apparent than facilities themselves or other physical assets.

In addition, the engineering-heavy language surrounding the field often results in a communication gap between energy professionals and the executives who ultimately approve the budget. Perhaps most importantly, most top management executives see energy as a distraction from their core business. The emerging opportunities for energy savings and the growing sustainability imperative has put energy on the executive agenda, an unnatural place for what used to be back-office work. Loath to spend their limited time on energy issues, almost every single executive we met made a point of reminding us that they were “not in the business of energy management.” While it might be a mission critical component for many businesses, dealing with the intricacies of the energy world is simply a headache most top-level executives would rather live without.

“We’re not an energy company”

45% of companies cited a lack of executive interest or understanding as a major barrier to investments in energy.

INFOGRAPHIC

Key facts about the state of energy management

New opportunities

EVER IMPROVING TECHNOLOGIES

The price of **commercial solar systems** alone dropped

↓ **40%**

between

2010 and **2014**, according to **GTM research**.

POTENTIAL FOR CHANGE

Only

6%

of **companies we surveyed** believe "they have **exhausted all opportunities** for **energy savings**."

NEW AVENUES

Companies expect that by **2023** they will get an average of

29%

of their **energy** from sources **other than the utility or retail energy provider** more than doubling today's share.

Increasing complexity for customers

REGULATORY OVERLOAD

Hundreds of new or changed programs and **thousands**

of new or changed tariffs and rate structures are rolled out across US utilities every year.

UNKNOWN ENERGY SPEND

At least

24%

of companies surveyed thought their company **did not have** an "**accurate overview of how much energy it consumes and why**." Our qualitative research suggests this pattern is even more frequent.

EXECUTIVE ALIENATION

A full

41%

of companies surveyed cited **lack of executive interest** as a major barrier to new energy investments.

Companies have changed

EVER IMPROVING TECHNOLOGIES

A full

78%

of companies with revenues above \$1bn have centralized their energy management function—most within the past 10 years.

The industry is lagging behind

LACK OF CREDIBILITY

A full

41%

of companies surveyed cited **lack of a credible partner** as a major barrier to investing in energy.

INSUFFICIENT THOUGHT LEADERSHIP

Most energy managers rely primarily on their peers for information—**less than half see third parties** as an **important source of knowledge**.

A lack of data, standards and common practices within and across companies leads to missed opportunities.

The majority of companies still have massive untapped savings opportunities when it comes to energy. Only 6% of companies surveyed believe they have exhausted all significant savings opportunities. Leading companies we spoke to routinely achieved

returns of more than 20% on investments in

low-hanging fruits such as lighting retrofits, improved procurement strategies or by taking advantage of tax credits for renewable energy generation. Still, 38% of companies with +\$1bn revenue claim they have yet to implement a significant retrofit project.

Companies have changed

78% of companies surveyed with +\$1bn revenue have centralized their energy management function—most within the past 10 years.

Meanwhile, the real savings often lie in opportunities that companies are unaware of. According to our findings, 24% of companies with +\$1bn revenue claim they don't have an accurate understanding of how much money they spend on energy or what exactly they spend it on. The true number is probably even higher, considering that more than 50% of companies report they have no way of consolidating utility bill payments across their different sites, and most energy managers we spoke to had their own definition of what to include when totaling the energy spend. Many, for instance, know only the approximate electricity spend, without having a clear sense of associated investments in equipment or maintenance.

Unknown energy spend

At least 24% of companies surveyed with +\$1bn revenue do not have an accurate understanding of how much money they spend on energy or what exactly they spend it on.

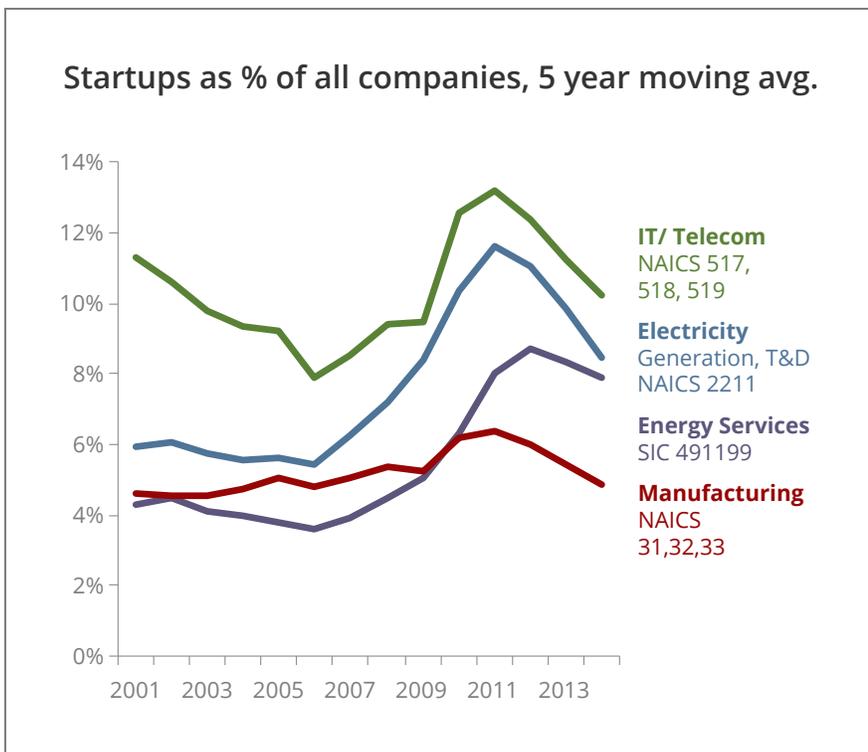
NEED FOR INTEGRATION

Just as importantly, in most companies, investment decisions on new energy projects are often made in a vacuum. For example, a company might be exploring the merits of a potential solar project, comparing different vendors and locations, but rarely would anyone check to see if a fuel cell would be a better investment of time and money. And rarer still would be an attempt to combine different technologies and solutions within a single project to see if the whole would be greater than the sum of the parts, as can be the case when solar, storage and demand response solutions are paired correctly. As such, there could be tremendous potential in exploring solutions that cut across technology platforms.

It's likely that effective and creative solution integration will increasingly be *the* key capability for the world's most advanced energy managers.

A lack of reliable data is another reason why organizations are missing savings opportunities. This is particularly clear when it comes to selecting providers of energy services and solutions. Countless startups have entered the energy services space over the past few years, to the point where the rate of new entries is beginning to resemble the startup scene in the IT world (*see graph below*). Yet across most sub-industries the market lacks transparency, with little information available to ascertain the track

record of vendors. Many energy executives noted how the high variability in performance left them to overwhelmingly rely on personal relationships even when these partners might lack presence or experience in the needed locations.



THE INDUSTRY HAS NOT CAUGHT UP

A lack of credible partners means organizations are left to their own devices.

Even as companies have centralized power in energy groups and built out their capabilities, it seems that the industry hasn't caught up and won't be able to keep up in the future. Most energy managers believe that the vendors and providers in the current energy services space aren't capable of providing guidance on the full

spectrum of challenges and solutions relevant to large organizations. A full 41% of companies surveyed cited the lack of a credible partner as a major barrier to new investments in energy.

The market lacks an integrator

"Someone could drop off all the parts to build a Ferrari in my driveway and I would never have a working Ferrari ... I would build a go-kart."

– Executive, national real-estate trust

Executives described how most partners—even those who tout their strategic abilities—tend to

come off as product and service specialists, ill-equipped to create, or even consider, the scope of a comprehensive energy strategy. Many providers only have one product to sell, while those with a broader portfolio of solutions tend to operate in a vacuum, ignoring the synergistic effects of working across categories.

When it comes to figuring out how the pieces fit together, customers are left on their own, yet lack the capabilities and organizational focus necessary to succeed. As one executive remarked: "Someone could drop off all the parts to build a Ferrari in my driveway and I would never have a working Ferrari... I would build a go-kart." Both executives and energy managers noted a lack of thought leadership within the industry, instead relying on peers in other organizations for advice and new ideas.

A NEW MODEL FOR ENERGY MANAGEMENT

The changes in the energy market are pointing to a need for a new kind of service provider.

Something has to change. The explosion of opportunities for better energy management has led to overwhelming complexity and has created a headache for executives. Many organizations have been building out their internal capabilities within energy management, but the lack of a universal language of energy—understood by engineers and executives alike, and facilitating fact-based comparisons—prevents them from taking advantage of the opportunities in front of them. Meanwhile, the industry at large is lagging behind, caught in a siloed, technology-centric hype cycle. This state of affairs is not sustainable.

We believe that better insight and integration across data, technologies, and strategic goals will unlock the next wave of innovation in energy. In the future, a new breed of service provider will make energy more accessible to senior management by combining engineering expertise, strategic thought leadership and a willingness to take on the risk of energy management. In time, energy will not be sold as a commodity but instead delivered as a comprehensive service, in which companies get access to reliable, sustainable and affordable energy and energy management programs, delivered by professionals who are fluent in the details of engineering and the practicalities of business.



INSIGHT



INTEGRATE



SIMPLIFY

At **Edison Energy**, we want to help by creating a market for what one might call Energy-as-a-Service. We have the teams, tools and practices necessary to help companies take full advantage of the emerging opportunities in energy management—with less hassle and less risk. It will not be easy, and there is still a lot to do. What we do know is this—it is time to **make energy simple again.**



EDISON
ENERGYSM

An *EDISON INTERNATIONAL*® Company

Edison Energy is an independent advisory and services company with the capabilities to develop and integrate an array of energy solutions across supply and demand for the largest energy users nationwide.

We work at the intersection of technology, policy, engineering, business and environmental objectives to **enable clients to take full advantage of the value available to them in the energy marketplace today**—and in the future.

Our heritage, resources, experience and entrepreneurial business model enable us to deliver the insights, integration and Energy-as-a-Service approach to help **make energy simple** again.

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