

# Next Generation Energy Management:

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A Roadmap to the Next Level of Performance  
Phase One Report



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## Introduction

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CoreNet Global and Rocky Mountain Institute (RMI) have established a new research and engagement collaboration to help corporations develop and execute next generation energy management plans to drive corporate energy performance to the highest possible level; transforming corporate real estate energy use away from fossil fuels through increased investment in efficiency and renewable energy. Our approach to achieving this goal is to enable corporations to profitably leverage important emerging and fast-changing drivers of energy efficiency and renewables investment in their own businesses.

Corporations have made progress in energy management and performance since 2007, when Rocky Mountain Institute and CoreNet Global published “The Energy Challenge: A New Agenda for Corporate Real Estate.”<sup>1</sup> Our recently conducted review of corporate sustainability and energy management literature shows that most companies have begun implementing some level of sustainability and energy management. Most have established goals (though not necessarily time bound or appropriately ambitious) to reduce energy use and greenhouse gas emissions, and many have made some progress toward meeting those goals.<sup>2</sup> Over two-thirds of corporations now have a sustainability agenda and staff as well as energy management plans, and nearly half have dedicated energy managers, a position that was only just emerging in 2007.<sup>3</sup>

However, in recent years, many corporate executives also believe that sustainability efforts have reached a plateau, with efforts creating incremental impact and little change to sustainability metrics.<sup>4</sup> Moreover, it has become clear that resources dedicated to framing quality projects are limited and employees often under-trained for the task, and that in evaluating those projects most energy efficiency decisions are based on simple payback of energy costs over short time frames, limiting investment and impact.<sup>5</sup>

Fortunately, the opportunity to develop and achieve more ambitious energy management and performance goals is supported by the dramatic changes in the

drivers of energy efficiency and renewables since 2007. These changes make it possible for corporations to financially benefit from more ambitious goals while making significant contributions to improving people’s health, happiness, and security.

Acknowledging the need and opportunity to strive for higher goals, CoreNet Global’s February 2013 Net Zero Energy in Buildings advocacy statement encourages corporations to strive for net-zero buildings as a top indicator of long term energy management success, and lists several solutions to make execution possible.

During the next year, CoreNet Global and Rocky Mountain Institute will engage with the corporate real estate community to further investigate the key drivers of energy efficiency and renewable energy investment. In addition, we will develop a roadmap to assist corporations in achieving the highest goals practical for building energy performance, even when finding investment dollars proves challenging.

This phase one document presents our initial assessment of key drivers that support and necessitate the successful execution of next generation energy management and performance. It also presents the CoreNet Global Energy Solutions list from 2013, which will serve as a starting point to be updated over the next year.



## Key Drivers Enabling Next Generation Energy Management



An overarching theme of the change in drivers since 2007 is that energy and sustainability have become significantly more integrated, measured, and public. Most senior corporate executives think that environmental, social, and governance (ESG) issues include energy management, rather than isolating energy in its own silo. Sustainability has become firmly established on the corporate agenda, with 83 percent of corporations viewing sustainability as consistent with their profit mission, up from 58 percent in 2006.<sup>6</sup> Further, a little more than half of companies now make their environmental and social goals public.<sup>7</sup>

The increased integration and prominence of sustainability presents the opportunity for significant increase in the value contribution that can be attributed to energy efficiency and renewable energy. It becomes incumbent upon the corporate real estate executive, and particularly the energy and facility managers and their service providers, to understand how energy efficiency and renewable investment fits within each broader corporate policy context in order to do next generation energy management.

Our initial framing of nine key drivers enabling and necessitating next generation energy management and performance are presented below.

### Energy Cost Savings

Energy cost savings continues to rank as a primary driver of corporate sustainability overall and the most important driver for sustainable real estate.<sup>8</sup> Between 2009 and 2012, over 90 percent of corporate leaders continued to cite energy cost savings as important for corporate sustainability, and over 40 percent cite it as the most important driver.<sup>9</sup> However, recent findings not focused on sustainability also suggest that cutting energy costs is viewed as less essential to company competitiveness and a less significant motivation to corporate energy management indicating it may be losing ground to other drivers such as sufficiency, reliability, and profitability.<sup>10</sup>

While energy cost savings as a driver has not changed significantly, companies that use a lot of natural gas are, under many contract terms applied to buildings use, subject to its fluctuating price including a sharp rise from its unbelievably low price in early 2012. Reducing exposure to natural gas price variation through alternative heating approaches like heat pumps, efficiency, biofuels, or even solar hot water and other approaches makes sense despite the generally low prices currently available.

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## Sustainability Measurement

The ability to quantify and even monetize the demand by stakeholders and more effectively manage energy efficiency and renewables investment has dramatically improved since 2007 as a result of more effective methods to measure sustainability at both the company—and property—levels. Measurement and verification systems at all levels continue to emerge and evolve to drive greater energy performance and monetization of values beyond energy cost savings.

Measures and indicators at the company level include the Carbon Disclosure Project, the Global Reporting Initiative, the Dow Jones Sustainability Index, and custom measures included in sustainability reports. Assessments and audits of company sustainability reports are also being used to verify claims, although most observers note there is still a long way to go.<sup>11</sup> Most notably, in 2007 the International Auditing and Assurance Standards Board launched a project to create a new standard for assurance engagements on greenhouse gas, which was formally approved in 2012.<sup>12</sup> New ways to measure sustainability continue to emerge, including efforts by The Economics of Ecosystems and Biodiversity (TEEB).<sup>13</sup>

Property level measures include the U.S. Energy Star rating as well as LEED, BREEAM, GreenStar, CASBEE, Green Globes, and other international green building rating systems. As new versions of these systems have emerged, they have routinely increased thresholds for energy efficiency and sustainability performance, partly driven by the ongoing Sustainable Building Challenge<sup>14</sup> and more recent emergence of net-zero energy (NZE) buildings,<sup>15</sup> deep energy retrofits (popularized by RMI among others), and related movements to drive performance higher.

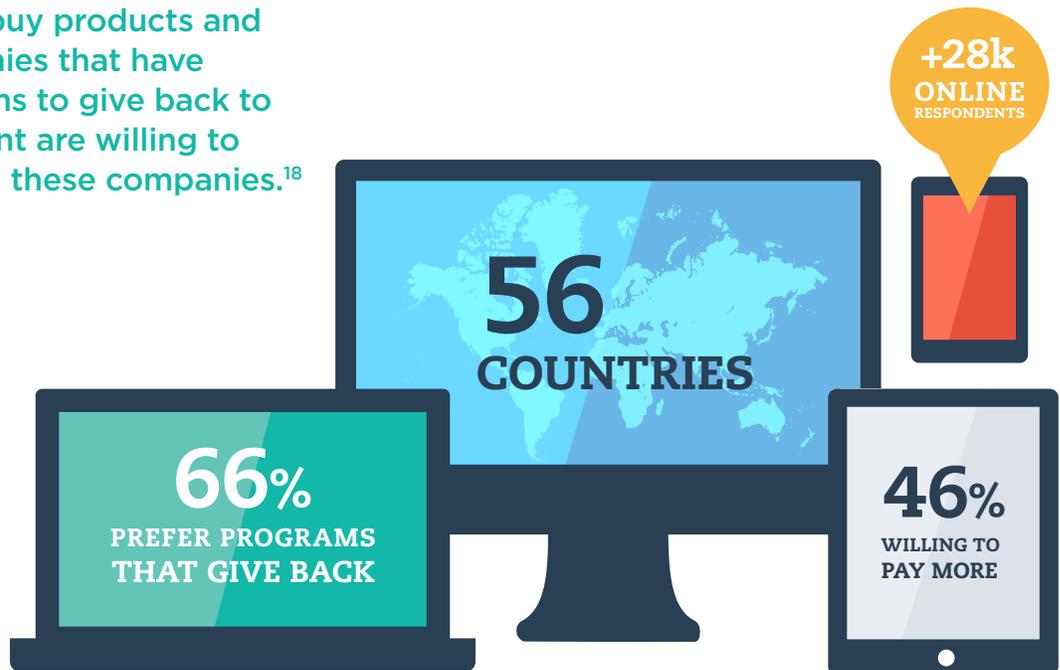
**Measurement and verification systems at all levels continue to emerge and evolve to drive greater energy performance and monetization of values beyond energy cost savings.**

## Stakeholder Demand for Sustainability

Perhaps the most important change since 2007 is the growing demand for sustainability by corporate stakeholders including customers, employees, shareholders, institutional investors, governments, and others. In a 2012 survey, 83 percent of corporate respondents said they are either working directly with their suppliers or are discussing with them how to measure sustainability impacts.<sup>16</sup> Walmart will buy 70 percent of the goods it sells in U.S. stores from suppliers who use its Sustainability Index.<sup>17</sup> A 2012 Nielsen survey that polled more than 28,000 online respondents from 56 countries found that 66 percent of consumers prefer to buy products and services from companies that have implemented programs to give back to society, and 46 percent are willing to pay more to buy from these companies.<sup>18</sup> This is a dramatic change from 2007, when the comparable numbers were generally in the 10–20 percent range in most regions. Governments at all levels continue to press for higher levels of building performance, and employees, due to the increasing number and visibility of sustainability measurements, are taking notice. Social and environmental issues now account for 40 percent of shareholder proposals, and shareholder inquiries seeking to reduce company energy consumption top the list of all inquiries.<sup>19</sup>

Increased stakeholder demand makes sustainability investment more visible and valuable. Buildings energy efficiency and renewables investment is a significant part, often the dominant part, of most corporations' sustainability footprints, and accordingly its value has increased significantly since 2007. This indicates the need for (and value of) much deeper energy investment as part of an energy transformation strategy.

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## Capital Availability

**Energy efficiency and renewables investments are beginning to compete for corporate equity on a more even playing field relative to other investment opportunities, potentially opening up vast pools of capital.**

The new approaches to providing low cost capital for energy efficiency and sustainability developed since 2007 are beginning to reshape the execution landscape for energy transformation. And far more are in the pipeline as innovators swarm into the game. Already debt finance for energy efficiency, renewables, and even water-related investment at the property level is greatly enhanced, for instance with property assessed clean energy (PACE) financing programs providing low-cost long-term financing paid off through property tax bills at lower cost and better terms than previously available (now legal in 37 states). The largest PACE deals to date have been executed by corporate entities, and commercial PACE tests are underway across the country. Related on-bill finance and pay loan programs and other state and federal loan subsidy programs have also significantly advanced from 2007. Green bonds and other special instruments have been created and successfully launched. Rebates, tax incentives, and other government and utility subsidies continue to be important sources of capital.

Financial innovations in solar energy and energy efficiency have also unlocked an emerging supply of new, low-cost capital.<sup>20</sup> Energy performance contracts (EPCs), energy service agreements (ESAs), and solar and wind power purchase agreements (PPAs) that offer 100 percent financing and limit corporate execution risk have also advanced significantly in the last few years with new models and structures being developed to enable broader application to corporations (historically over 90 percent have been used by governments and quasi-governmental institutions) as well as being able to fund deeper energy efficiency projects.

Perhaps most importantly, as a result of other drivers—including increased demand by stakeholders, better sustainability measurement, and improved data and methods to value non-energy cost benefits<sup>21</sup>—energy efficiency and renewables investments are beginning to compete for corporate equity on a more even playing field relative to other investment opportunities, potentially opening up vast pools of capital.

## Risk Mitigation and Management

Improved risk mitigation and management since 2007 is significantly reducing barriers to energy efficiency and renewables investment. Many obstacles to sustainability investment were once due to the belief that the benefits (returns) to investing were not worth the risk of execution. This is no longer true—many are now realizing that the key barriers are information, understanding, and execution processes.

As many of the drivers suggest, the upside potential with customers, employees, and cost reduction has significantly improved since 2007. Fortunately, the risks of execution are also down significantly as the level of experience of internal sustainability/energy professionals and external service providers has improved. Similarly, energy audits, energy modeling, product performance, measurement and verification, commissioning, cost estimating, and other key execution processes have made significant advances. Specialized third-party insurance products have also evolved as have specialized due diligence for sustainability/energy efficiency related contracts, leases, and warranties. Lastly, improved understanding of the potential positive risk benefits of energy efficiency and sustainability investment is also on the rise.



## Workplace Transformation

Corporate workplaces are transforming across the globe. Two-thirds of workplaces are either in the process of implementing or planning a workplace transformation program.<sup>22</sup> Workplace transformations include many changes ranging from introducing an open office layout to more sophisticated communications technology and more flexible work hours.<sup>23</sup>

Workplace transformations can also reduce the amount of space required per employee, which can reduce energy use and improve overall company sustainability. While predictions of space reductions vary greatly by region and type of company, potential space reductions of 10 percent to 30 percent or more are possible and are now anticipated for many companies. This trend is enhanced by the “return to the urban center” and more compact footprints, exemplified for instance by the wholesale move of the best new firms in Silicon Valley to San Francisco. Moreover, the process of changing the office design creates the opportunity to integrate sustainability and energy efficiency improvements.<sup>24</sup>

Corporations have had to, or still need to, implement more sophisticated space management systems—often called “integrated workplace management systems”—to adequately address workplace transformations and corporate requirements for space flexibility due to shorter product cycles and more rapid business change. These new and forthcoming systems create the opportunity for energy management systems to integrate with and support these other corporate imperatives to achieve best possible energy performance.

## Smart Building Technology

New technologies and technological innovations—particularly those pertaining to low cost sensors and data gathering and communications, better materials and installation processes, and “big data” and machine-to-machine technologies—are making it much easier for corporations to plan, track, and manage energy use and other sustainability efforts.<sup>25</sup> These technologies are now widespread, with 93 percent of corporate leaders using technological tools to measure energy consumption in 2012.<sup>26</sup> Changes in technology are one of the most important drivers of corporate sustainability as cited by 79 percent of corporate leaders in 2009 and 81 percent in 2012.<sup>27</sup> As trends in “big” and “not-so-big” data help companies better manage their operations, corporations are expected to increase their use of sophisticated data management software to the point in which new sustainability IT applications become commonplace.<sup>28</sup>

As with the workplace transformation systems, these broader smart building and enterprise technologies integrate with energy management systems, helping to align with company strategy. Moreover, the “enterprise” level systems also offer the opportunity of more efficient data sharing, enabling building decision-makers access to important human resource, marketing, and customer data needed by building owners to properly assess the value contributions of their energy and sustainability investments.



## Healthy Buildings

More evidence exists now than ever before confirming that sustainable buildings improve the health of occupants and users. These positive health outcomes create value through reduced absenteeism, lower health costs, reduced litigation, and lower future regulatory risk.<sup>29</sup> Other benefits include increased productivity from those happier, healthier people.

The evidence has reached a critical mass causing healthy buildings to be as strong a driver of building related sustainability investment as that of energy cost savings. For example, 83 percent of building owners cited occupant health and wellbeing and improved indoor environment/air quality as the most important factors motivating investments to increase building performance. Lower operating costs ranked third at 77 percent.<sup>30</sup>

The value contributions of planning healthy building investments together with energy efficiency can also dramatically exceed the value of regarding them separately.

## Electricity Grid Evolution

Technology, regulation, and market dynamics since 2007 have enabled greater distribution of energy production and greater customer choice than ever before. Since 2007, on-site generation has become popular for companies where the electric grid is not stable (e.g. India) or where renewables such as biomass are readily available (e.g. Brazil).<sup>31</sup> However, with the costs of solar PV dropping 75 percent in the past six years, investment in on-site generation is growing globally.

These dynamics along with advances in energy storage have made it possible to create a “utility in a box”—combining distributed energy with energy storage. While already common practice for backing up data centers (typically a diesel generator-plus-battery), it is now economical to invest in a solar-plus-battery combination in Hawaii, and it could become economical elsewhere in the U.S. within a decade.<sup>32</sup>

In addition to beating the utility in the cost of delivered electricity, such microgrids at the building or corporate campus level can provide many company benefits including increased reliability, system resiliency, and peak load shaving. Moreover, net metering (where available) allows microgrid operators to sell excess generation back to the larger grid. Another potential revenue stream can flow from the creation of real-time markets for ancillary services and demand response programs that support grid operation.

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## Preliminary Solutions for Next Generation Energy Performance

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The preliminary set of solutions for next generation energy management and performance presented here is taken directly from CoreNet Global's February 2013 Net Zero Energy statement. We will test and refine this set over the next year through industry engagement and focused research:

- ✓ Energy efficient design and construction for new and retrofitted facilities
- ✓ Integrated supply and product development chains that reduce energy consumption
- ✓ Green leasing and development practices encouraging energy savings, cost reduction, and lower carbon footprints
- ✓ Mobility and other flexible workplace practices with proven ability to reduce energy use from the building, production, employees, commuting, and more
- ✓ Employee training to educate, build awareness, and constructively align personal behaviors with company culture and sustainability practices
- ✓ Use and reuse of natural resources starting with sunlight, air, and water
- ✓ Use and reuse of building materials like weather sealing, insulation, and windows; as well as energy-efficient boiler and cooler systems
- ✓ Incorporation of alternative energy resources such as solar, wind, hydro, and biofuels from either primary or secondary suppliers
- ✓ Integration of carbon tax credits in triple bottom line accounting models
- ✓ Regionalization or localization of supply chains where feasible
- ✓ Creation of microgrids among energy self-generating facilities at or approaching net-zero status that are able to sell surplus energy to the commercial grids
- ✓ Application of fundamental scientific breakthroughs and other technological innovations to alternative energy systems including energy storage and transmission
- ✓ Emphasizing unique forms of cogeneration like biomass, frigid water supplies, and closed loops like district energy systems

## Developing the Next Generation Energy Management Roadmap

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Changes in the key drivers of building energy efficiency and renewables investment between 2007 and 2014 suggest an escalation of the interest in, and ability of, corporations to profitably transform away from fossil fuels. However, the actual adoption of corporate building energy efficiency and sustainability remains low and in many companies has stagnated. The corporate real estate industry is therefore missing out on a substantial opportunity to increase profits, reduce risks, and make even stronger contributions to society.

To assist corporations in capturing this opportunity, CoreNet Global, through the CoreNet Global Sustainability Community, and Rocky Mountain Institute will work with the corporate real estate industry during the next year to develop a Next Generation Energy Management Roadmap. This Roadmap will be based on further investigation and research of key drivers of energy efficiency and renewable energy investment, clarification of obstacles to market change, and development of a refined and expanded set of solutions, and will serve as a guide for development of further tools, data, and knowledge to help the industry transform its use of energy.

Those who are interested in getting involved can contact **Craig Van Pelt** ([cvanpelt@corenetglobal.org](mailto:cvanpelt@corenetglobal.org)) and **Mike Bendewald** ([mbendewald@rmi.org](mailto:mbendewald@rmi.org)).

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## End Notes

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- 1 For the full version of the 2007 Rocky Mountain Institute and Corenet Global report, go to [http://www.rmi.org/Knowledge-Center/Library/2007-14\\_CorenetEnergyChallenge](http://www.rmi.org/Knowledge-Center/Library/2007-14_CorenetEnergyChallenge)
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- 20 For more on the issue related to small building finance, see the RMI Blog: [http://blog.rmi.org/blog\\_2014\\_03\\_05\\_getting\\_big\\_investment\\_to\\_retrofit\\_small\\_buildings](http://blog.rmi.org/blog_2014_03_05_getting_big_investment_to_retrofit_small_buildings)
- 21 See Rocky Mountain Institute's: How to Calculate and Present Deep Retrofit Value for Owner Occupants for a detailed practice guide on how to integrate risk and value into corporate retrofit decision-making.
- 22 Workplace Transformation Survey: "A Global View of Workplace Change," Cushman & Wakefield, 2013/2014.
- 23 Corporate Real Estate 2020 Final Report: Workplace
- 24 AT&T and RMI: Unlocking Funding for Deep Energy Savings, *The Leader*, November/December 2013.
- 25 State of Green Business 2014, Green Biz Group & Trucost
- 26 Greening of Corporate America, Siemens & McGraw-Hill, 2012.
- 27 Ibid.
- 28 Top Corporate Sustainability Trends to Watch in 2012, <http://www.fastcompany.com/1803277/top-corporate-sustainability-trends-watch-2012>
- 29 For full documentation of evidence for health value, see "How to Calculate and Present Deep Retrofit Value for Owner-Occupants" by Rocky Mountain Institute (2014)
- 30 A Path to Achieving Higher Building Performance through Retrofits and Ongoing Operational Improvements, McGraw Hill and Siemens, 2012. P. 35
- 31 Global Corporate Renewable Energy Index 2012, Bloomberg New Energy Finance
- 32 The Economics of Grid Defection, Rocky Mountain Institute, 2014.

## About CoreNet Global

CoreNet Global is the world's leading professional association for corporate real estate (CRE) and workplace executives, service providers and economic developers. CoreNet Global's 8,900 members, who include 70% of the top 100 U.S. companies and nearly half of the Global 2000, meet locally, globally and virtually to develop networks, share knowledge, learn and thrive professionally. This research is being led by the CoreNet Global Sustainability Community and the efforts of the Sustainability Community Knowledge Advisory Panel. For more information, please visit [corenetglobal.org](http://corenetglobal.org) and [corenetglobal.org/sustainability](http://corenetglobal.org/sustainability).



## About Rocky Mountain Institute

Since 1982, Rocky Mountain Institute has advanced market-based solutions that transform global energy use to create a clean, prosperous and secure future. An independent, nonprofit think-and-do tank, RMI engages with businesses, communities and institutions to accelerate and scale replicable solutions that drive the cost-effective shift from fossil fuels to efficiency and renewables. Please visit <http://www.rmi.org> for more information.

