

# 2013 ENERGY EFFICIENCY INDICATOR SURVEY



## Global Summary



*Seventh annual survey of global building decisions-makers shows a correlation between energy goal-setting and key energy efficiency behaviors and investments*

## INTRODUCTION AND OVERVIEW

The 2013 Energy Efficiency Indicator (EEI) study, conducted by the Johnson Controls Institute for Building Efficiency, analyzes the energy efficiency technologies, practices and investments made by over 3000 executive decision-makers around the world. (Figure 1) Conducted annually since 2006, this year's respondents come from ten countries and a variety of commercial, industrial and institutional facilities (such as hospitals, schools, and government buildings) (Figure 2).

In 2013, we present a special analysis of this year's survey results taking a deep dive into the characteristics of organizations who are leading in energy efficiency investment and action. Then we review key trends regarding the importance of energy efficiency and energy management, the drivers for efficiency action, the barriers and funding issues faced in the market and the technology mix deploying around the world.

In 2013, over 3000 global executives with decision-making authority over their company or organization's energy investments and activities completed the survey, which was conducted anonymously through a third party provider. The Energy Efficiency Indicator also relies on the International Facility Management Association and the Urban Land Institute as our global partners and over a dozen strategic regional partners. *(Information on the survey can be found in the Appendix).*

*Figure 1: 2013 EEI Survey Scope*

**The 2013 Energy Efficiency Indicator survey drew over 3,000 respondents from 10 countries**

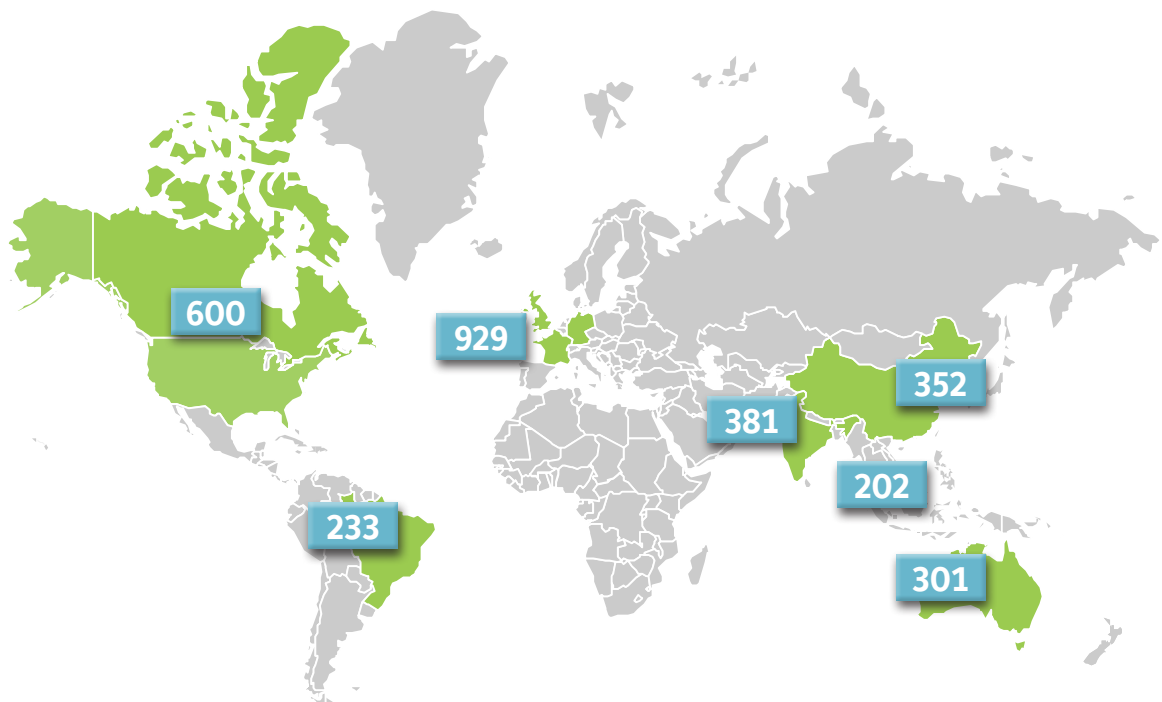


Figure 2: Global Respondent Profile

Respondents represented a diverse mix of global decision makers



### CRITERIA

1. Must have budget responsibility for their organization's facilities.
2. Job responsibilities must include reviewing or monitoring energy usage, and/or proposing or approving initiatives to make organization's facilities more efficient.

## 2013 Findings

Organizations that lead in investment, technology deployment, and pursuit of benefits beyond energy cost savings also have in place carbon or energy reduction goals. In summary we find that organizations with publicly stated energy reduction goals:

- Implemented 50% more efficiency and renewable energy measures than organizations without goals.
- Are 2.7 times more likely to increase investments next year than other organizations.
- Adopted more energy management practices (such as frequently collecting and analyzing energy usage data).
- Indicated they see brand value, property value and other co-benefits as drivers for efficiency and renewable energy beyond the energy costs savings.
- Two-thirds of organizations with public or internal energy reduction goals reported planning to pursue green certification or net zero buildings in the future.

In addition to the deep dive analysis and review of top efficiency performance characteristics, this year we focus on 5 key trends from the 2013 Energy Efficiency Indicator survey:

- Energy Management - there has been a global increase of 10% year over year in companies that are paying "a lot more attention" to energy efficiency.
- Motivations and Policy Priorities: Cost savings remain the number one driver for the sixth year of the EEI survey, but regional markets recognize other key drivers such as energy security,

increased building asset value, and enhanced brand or public image. Policies that improve the economics of energy efficiency are sought by all, but beyond incentives, regions see different policy opportunities in their unique markets.

- Lack of funding to pay for improvements remained the greatest barrier to pursuing more energy efficiency, but barriers differ by market and technical capacity to evaluate performance remains a significant barrier.
- Among government energy efficiency policies, building decision-makers were most attracted to those aiming to reduce financial barriers to efficiency investments, but markets also saw building codes and appraisal standards as priority policies that could increase investment.
- Green tenant spaces and net zero energy buildings are emerging trends in building energy performance.

The appendix to this summary outlines the EEI survey scope, methodology, and respondent profile, and lists the IBE global and in-country partners who assisted with the survey.

## ORGANIZATIONS WITH ENERGY REDUCTION GOALS ARE LEADING IN INVESTMENT AND ACTION

In 2013, we examined the connection between organizations that lead in energy efficiency investments, technology measures deployed, management practices and other leading indicators. There was a strong relationship between those who have goals and have other leadership characteristics. We review the findings below:

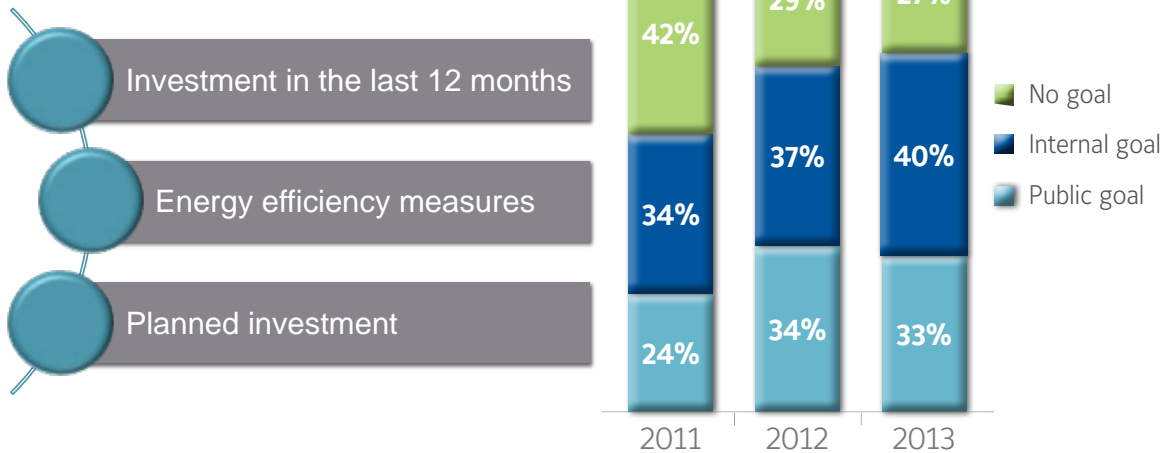
### **Energy or carbon reduction goals correlate strongly with more action on energy efficiency.**

The Energy Efficiency Indicator survey tracks the percentage of organizations in the commercial, industrial and institutional sectors that set goals for energy and carbon reduction, whether for internal purposes or announced publicly (Figure 3). Globally, 64% of organizations reported they had carbon reduction goals in 2013 and 73% had energy reduction goals.

Figure 3: Respondents by type of energy reduction goal

We confirmed that there is a relationship between companies with energy reduction goals and their actions:

These three populations showed differing:



Which of the following best describes your company's energy reduction goal?

We reviewed three organizational goal categories to see if there was a connection between their goals and their actions – and indeed, each group approached energy efficiency in strikingly different ways. The groups can be succinctly described as:

- **Organizations with no goal:** Those in this group had not increased efficiency investments significantly and took the fewest improvement measures on average.
- **Organizations with an internal goal:** Those in this group made significantly more efficiency investments and had implemented more efficiency measures than those that did not set goals.
- **Organizations with a public goal:** Those in this group surpassed the other two, showing multifaceted commitment to management strategies and actions that improve efficiency.

We reviewed these three populations with regards to three key indicators of energy efficiency and renewable energy leadership (Figure 4). Organizations that set goals, whether internal or public:

- **Invested more in energy efficiency or renewable energy:** 95% of organizations with public goals invested in energy efficiency or renewable energy in the past 12 months compared to 55% of organizations with no goals.
- **Adopted significantly more energy efficiency measures** in the past 12 months.
- **Planned to increase investments:** 72% of organizations planned to increase investments in energy efficiency or renewable energy in next 12 months compared to 26% of organizations with no goals.
- **Have stronger energy management practices** across a variety of practices including benchmarking energy performance and establishing an action plan to implement energy projects.

Figure 4: Correlation between goal-setting and key energy efficiency actions

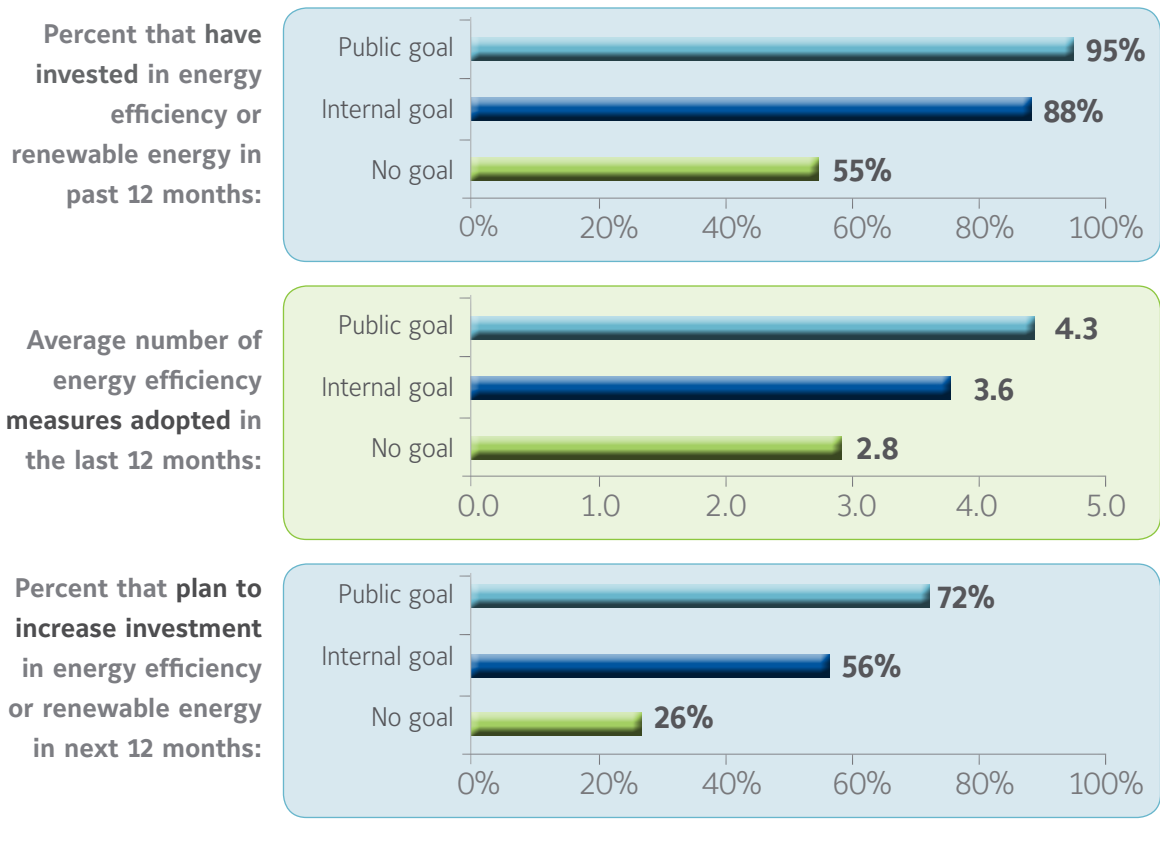


Figure 5: Energy goal segment analysis by energy management practice

Organizations with goals also have strong energy management practices

Energy management practice	No Goal	Goal
Tracked and analyzed energy use data at least monthly	52%	70%
Measured and verified energy project savings	42%	68%
Created an action plan to implement energy improvement projects	35%	67%
Benchmarked facility energy performance	37%	67%
Defined and communicated an energy policy and goals	36%	67%
Performed an energy audit of facilities or equipment	41%	66%
Dedicated a capital budget for energy improvements	31%	64%
Staffed an energy management team	18%	59%

To what extent have the following energy management practices been implemented or plan to be implemented in your facilities?

With the exception lighting improvements, organizations with goals were more likely to adopt a series of specific energy efficiency measures (Figure 6).

*Figure 6: Organizations with goals were more likely to implement efficiency measures beyond lighting retrofit projects.*

**Significant differences between organizations with goals are also seen in energy efficiency measures, except lighting improvements**

Energy efficiency measure	No Goal	Goal
Lighting improvements	66%	66%
HVAC and/or controls improvements	53%	60%
Water efficiency improvements	40%	55%
Energy focused behavioral or educational programs	33%	47%
Building envelope improvements	18%	37%
On-site renewable energy	12%	35%
Smart grid or smart building technology	10%	35%
Retro commissioning–system tune-ups	15%	31%
Non-renewable distributed energy or demand management practices	6%	21%

Payback requirements approximately 3½ years for all organizations

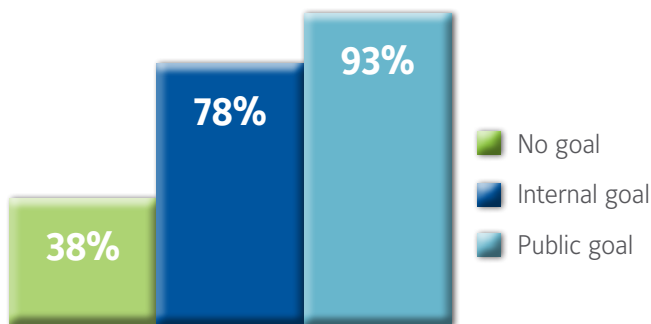
Trends are consistent globally and across small and large organizations

**Which of the following energy efficiency measures has your company adopted in the last 12 months?**

Organizations with goals were far more likely than those without goals to have plans to achieve voluntary green building status for new construction and existing buildings, and nearly zero, net zero, or positive energy status for one or more facilities (Figure 7).

*Figure 7: Organizations with goals planning to pursue green building certification or net zero energy status*

**Double the number of respondents that have public goals intend to achieve voluntary green building certification or net zero facilities**



**73%**  
of organizations intend to achieve nearly zero, net zero, or positive energy status for at least one new facility

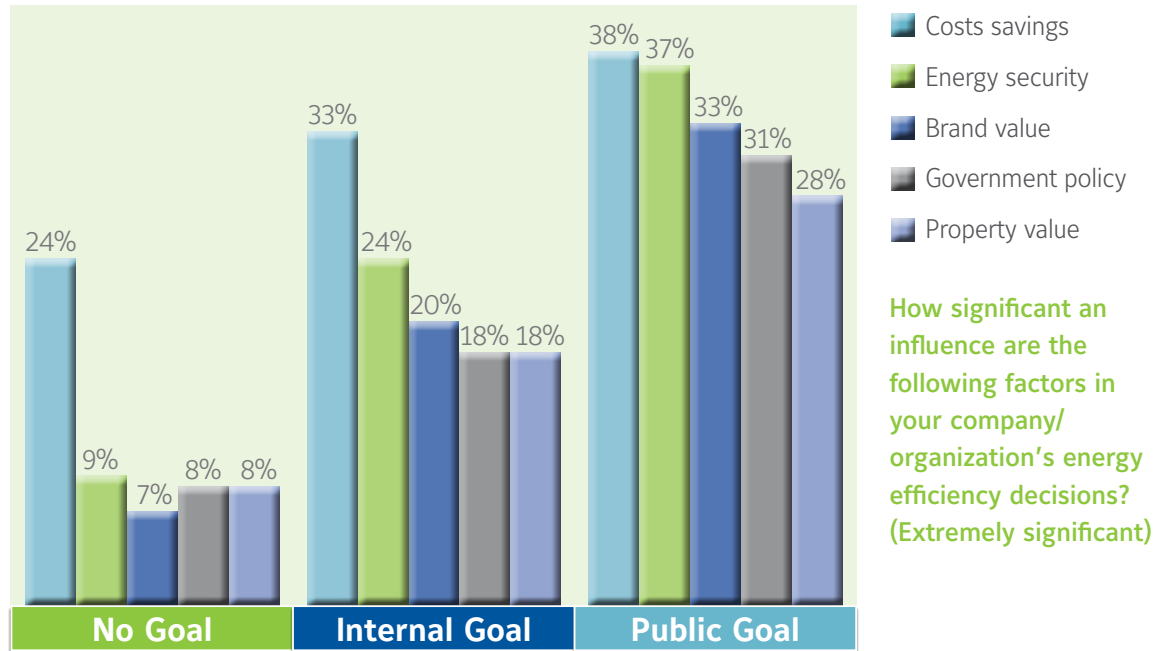
**Do you intend to achieve voluntary green building certification at any facility?**

**Do you intend to achieve nearly zero, net zero, or positive energy at any facility?**

Organizations with goals were also far more likely than those without goals to consider benefits beyond pure cost savings (such as greater property value, greater brand value, and energy security) when making efficiency investments (Figure 8).

*Figure 8: Correlation between organizational goals and recognition of a diversity of drivers for pursuing efficiency*

**Organizations with public goals report a variety of drivers for pursuing energy efficiency – beyond cost savings**

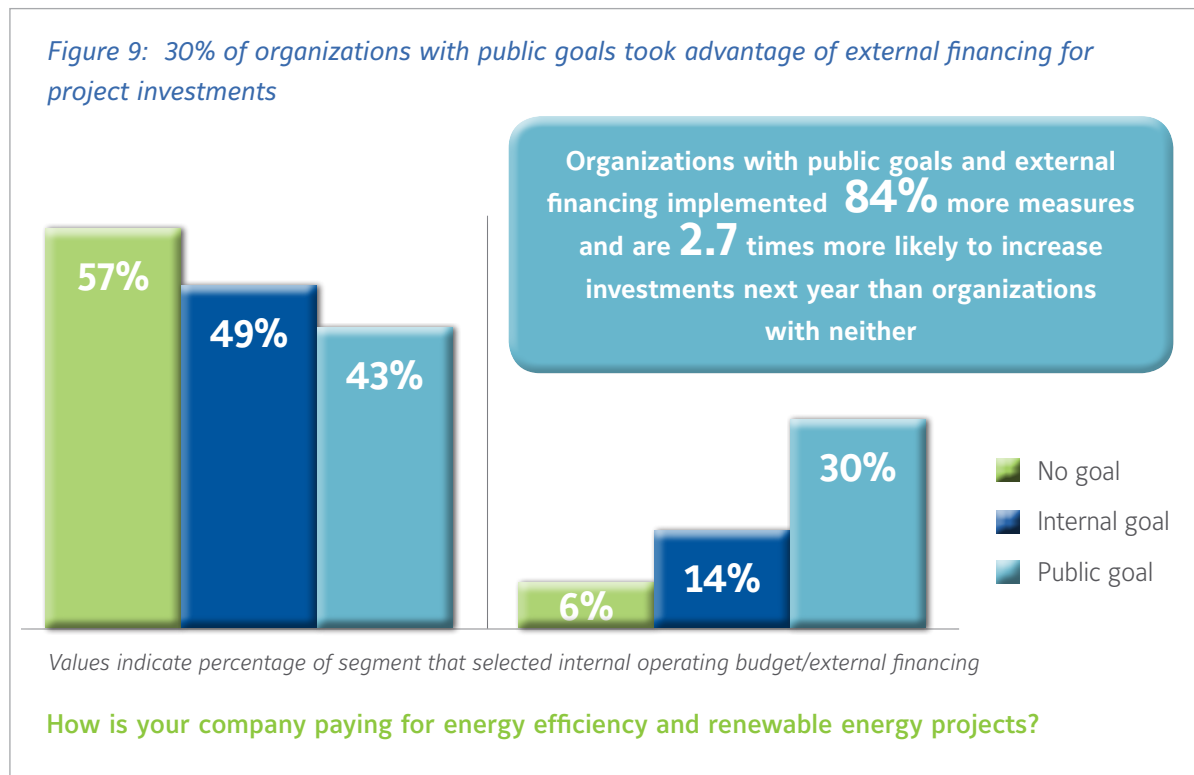


**Note:** The motivations listed in Figure 8 are clusters created from 12 potential efficiency drivers.

- Cost savings = energy cost savings and government/utility incentives/rebates.
- Government policy = existing and anticipated policies.
- Brand value = enhanced brand or public image, customer attraction/retention, investor reporting demands, and employee attraction and retention.
- Property value = tenant attraction and rent premiums and increasing the building asset value.
- Energy security stands by itself.



Finally, organizations that had set goals were far more likely than those without goals to utilize external financing for energy efficiency projects. Those with public goals who utilized external financing implemented 84% more measures and were 2.7 times more likely to increase investments next year than organizations with neither (Figure 9).

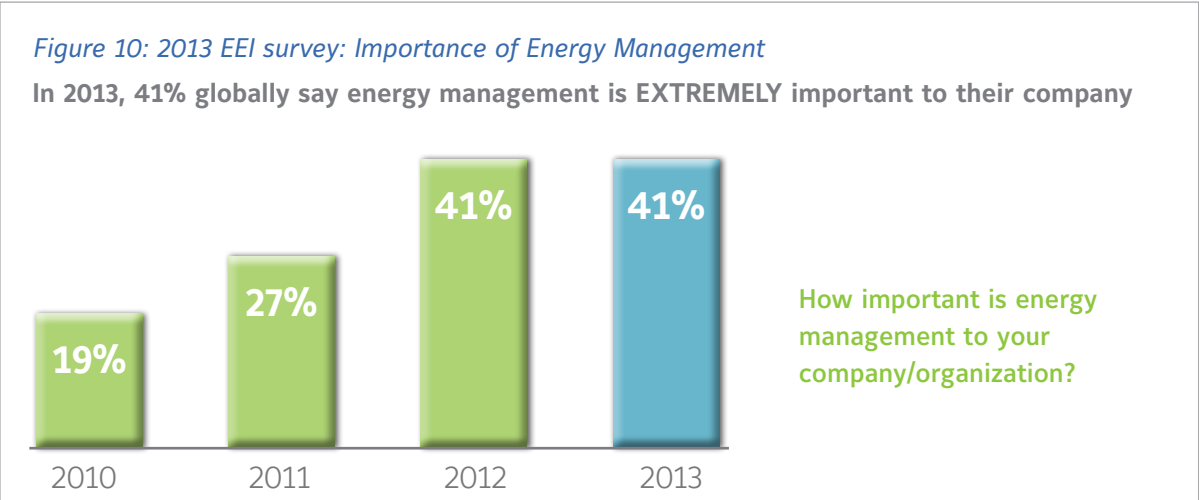


# GLOBAL TREND ANALYSIS

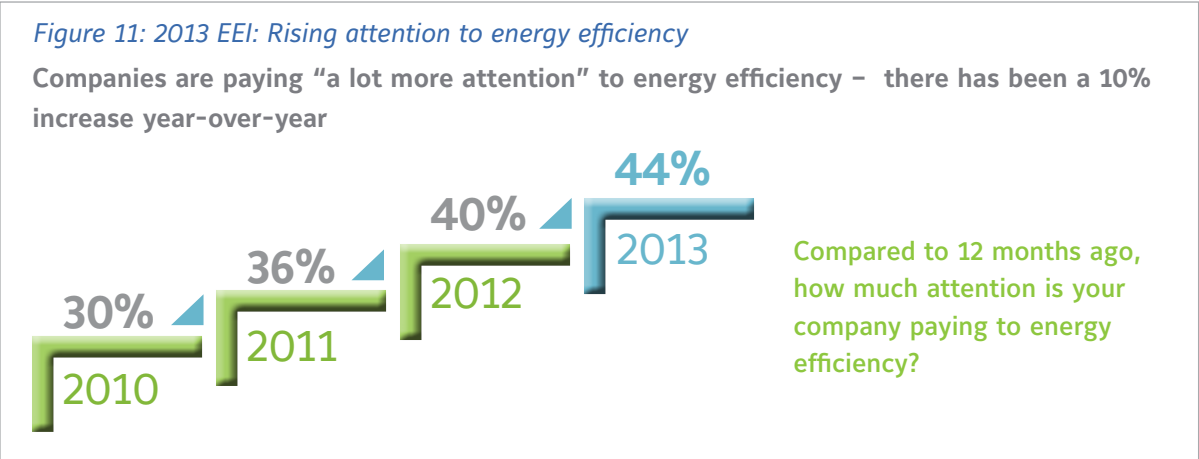
The EEI survey annually tracks a variety of building decision-makers' attitudes and actions, follows trends and compares results year-to-year. This year we focus on five trends: 1) the importance of energy efficiency, 2) market motivations and policy drivers, 3) barriers to investment, 4) building management and practices, and 5) technologies and measures.

## 1. ENERGY EFFICIENCY AND ENERGY MANAGEMENT REMAINS IMPORTANT TO BUILDING EXECUTIVES.

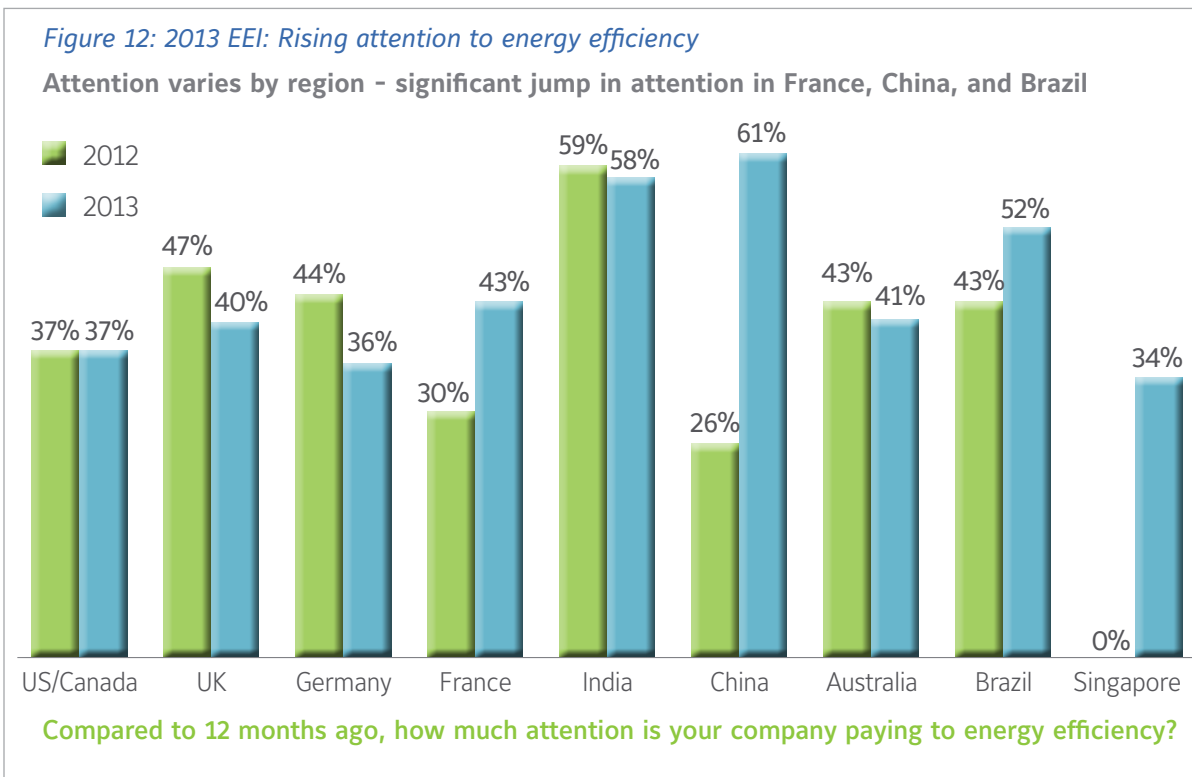
Large majorities of decision-makers in every country surveyed – from 71% in Australia to 93% in China and India – considered energy management very or extremely important to their organizations. Globally, 41% rated energy efficiency as extremely important, the same as in 2012 but up significantly from 19% in 2011 (Figure 10).



The survey also found organizations paying "a lot more attention" to energy efficiency – by 10% – versus 2012. In fact, rising attention to efficiency has been a clear trend for the past four years (Figure 11).



This increase in global attention to energy efficiency is true in nearly every market surveyed in 2013 when compared to 2012 (Figure 12). Interestingly, the UK and Germany saw decreases among those who were paying “a lot more attention” to energy efficiency this year than in prior years, while France saw a significant increase from 30% to 43% in those who said they were paying a lot more attention to energy this year. China saw the single greatest leap in those who said they were paying “a lot more attention” to energy efficiency this year.



## 2. DRIVERS OF INVESTMENT IN ENERGY EFFICIENCY AND PREFERRED GOVERNMENT POLICIES.

Each year we look at the motivations of executives around the world. We ask them how significant various drivers are to their organizations’ energy efficiency decisions. And we ask them which government policies they believe would have the greatest impact on improving the energy efficiency in buildings. Over the six years of the survey, we have found that the drivers and policies prioritized by respondents have focused around one of the central value propositions of energy efficiency: finding ways to ensure that their organizations can save money on energy. As we saw earlier in the report, there is a more nuanced picture behind the singular focus on energy cost savings – organizations actually do value different things. And as the charts below show, different countries also prioritize different drivers and policies.

## Cost savings continue to be the leading driver of energy efficiency.

Figure 13 (focusing on the Americas and Europe) and Figure 14 (focusing on countries in Asia) provide a country-by-country review of the top 5 drivers of energy efficiency. Respondents from Asia ranked energy security, brand value, government policy, and property value much higher than did those in the U.S./Canada and in Europe. In 2012, and again in 2013, greenhouse gas reductions as a driver of energy efficiency dropped out of the top 5 drivers in nearly each country surveyed except in the UK and Brazil. And existing government policy is only in the top 5 for China, which has been significantly strengthening its policies on energy efficiency. Newer drivers in the past several years include energy security and increased building value.

*Figure 13: Energy efficiency drivers by country: Americas and Europe*

**Improved economics, asset value and energy security drive investment in EU and Americas**

Drivers of Efficiencies	US/Can	UK	Germany	France	Brazil
Energy cost savings	1	1	1	1	1
Government & utility incentives/ rebates	2	2	4	2	
Increased asset value	3	5		3	
Energy security	5	3	2	5	2
Customer attraction & retention			5		3
Existing government policy					
Enhanced brand or public image	4		3	4	5
GHG footprint reduction		4			4

**How significant are the following in your organization's energy efficiency decisions?  
(extremely significant shown and ranked)**

Figure 14: Energy efficiency drivers by country: Asia

Asian markets motivated by security, economics and policy

Drivers of Efficiencies	India	China	Australia	Singapore
Energy cost savings	1	1	1	1
Government & utility incentives/rebates			2	2
Increased asset value			3	
Energy security	2	2		
Customer attraction & retention	3	5	4	
Existing government policy		3	4	3
Enhanced brand or public image	5	4		5
GHG footprint reduction				
Attracting, retaining employees	4			4

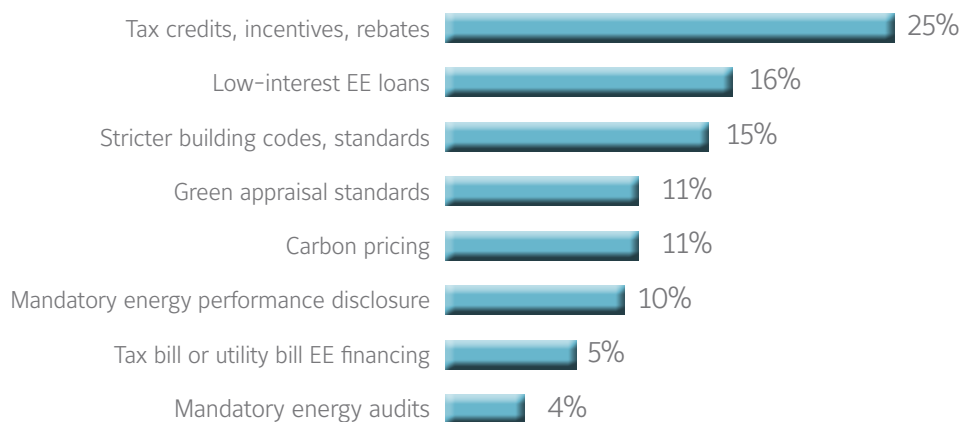
How significant are the following in your organization's energy efficiency decisions?  
(extremely significant shown and ranked)

## Among government policies, respondents continued to hold the strongest preference for those that improve the economics of energy efficiency projects.

The two policies cited as having the greatest potential to increase energy efficiency in buildings were tax credits and incentives or rebates for taking efficiency measures, and low-interest financing for energy upgrades (Figure 15).

*Figure 15: Policy priorities that would improve efficiency*

**Policies that improve project economics remain at the top of the list – complimentary policies are also important**



**Which of the following energy policies would have the greatest impact on improving energy efficiency in buildings?**

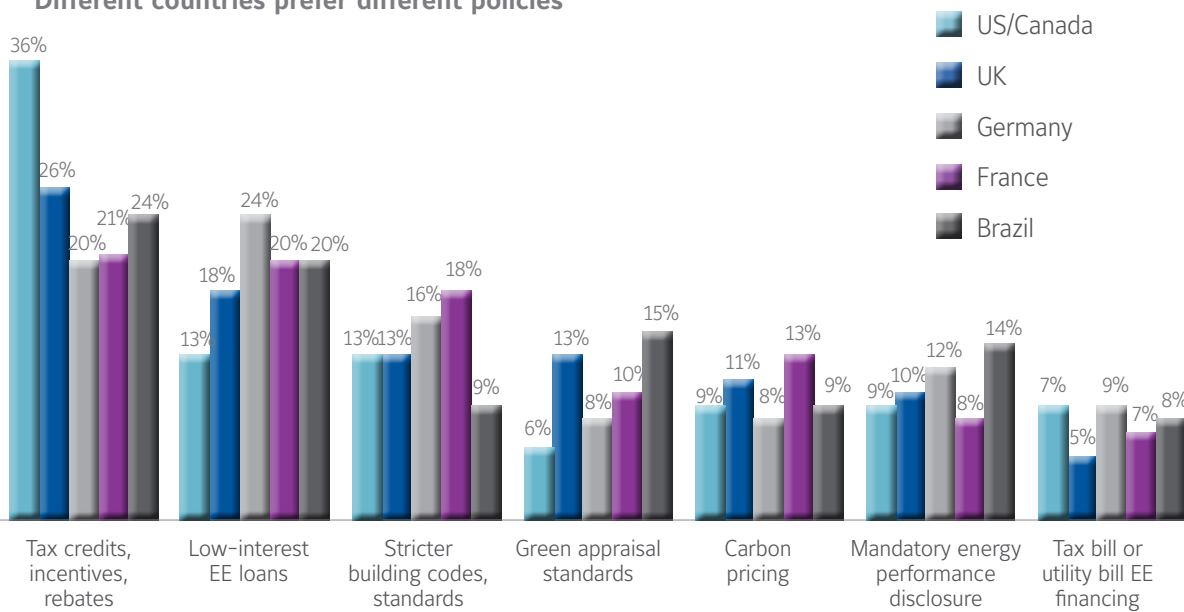
## National differences in policy priorities

Just as there are differing drivers depending on differing national circumstances of countries around the world, the policy priorities cited by respondents varied. Preference for tax credits and incentives were by far the strongest in the U.S./Canada at 36%, Australia at 30% and Singapore at 26%. Germany, France and Brazil valued low-interest loans. China, France and Australia had the highest percent of respondents who stated stricter building codes would have the greatest impact on efficiency in buildings. Interestingly, China led the world in those respondents who stated that green appraisal standards would improve efficiency in buildings – 19% – followed by India and Brazil at 16% and 15% respectively.

Separately, U.S. respondents were asked if budgetary uncertainty had impacted their investments: 41% of respondents indicated they had at least somewhat reduced investments in energy efficiency or renewable energy because they were uncertain about future federal government actions on budgeting and tax reform.

Figure 16: Prioritization of government policies that could improve energy efficiency: Americas and Europe

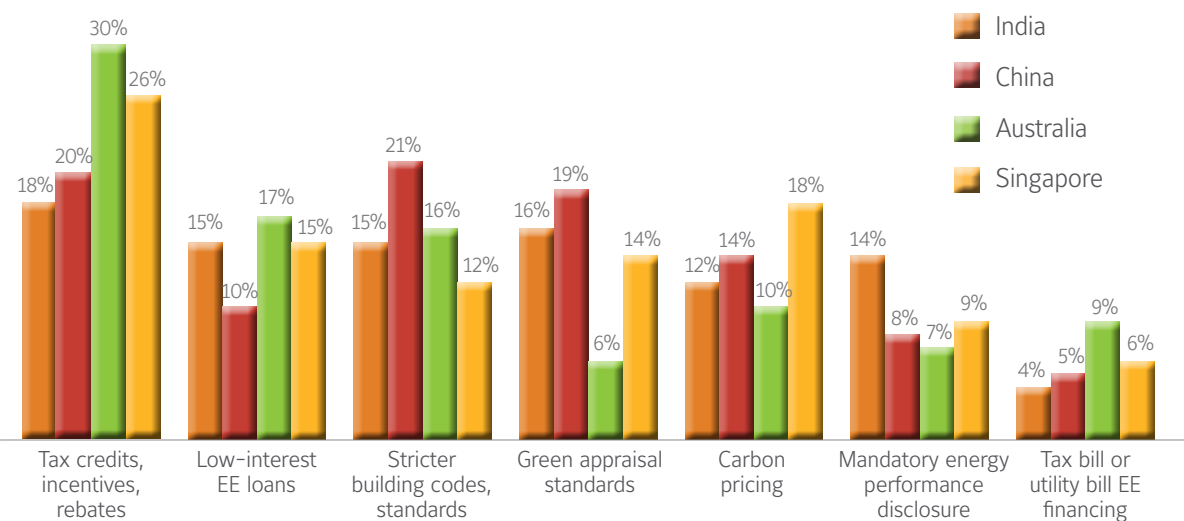
Different countries prefer different policies



Which of the following energy policies would have the greatest impact on improving energy efficiency in buildings?

Figure 17: Prioritization of government policies that could improve energy efficiency in: Asia

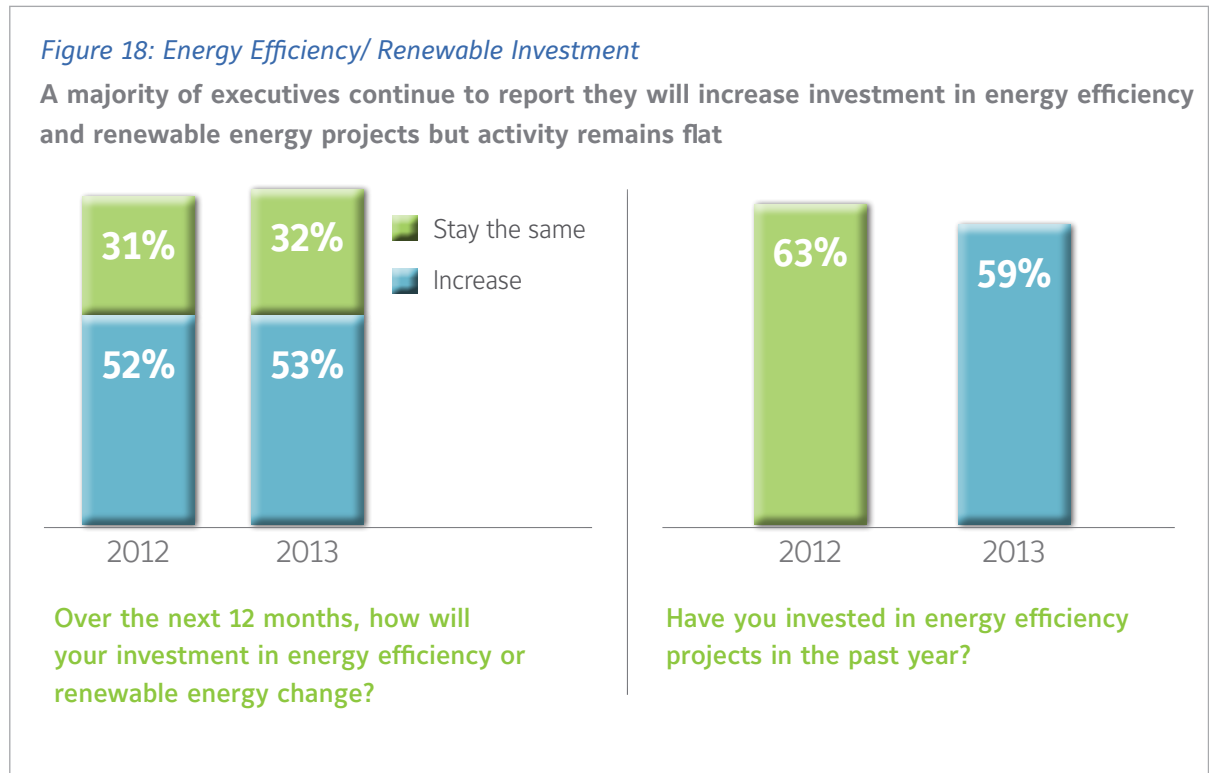
Different countries prefer different policies



Which of the following energy policies would have the greatest impact on improving energy efficiency in buildings?

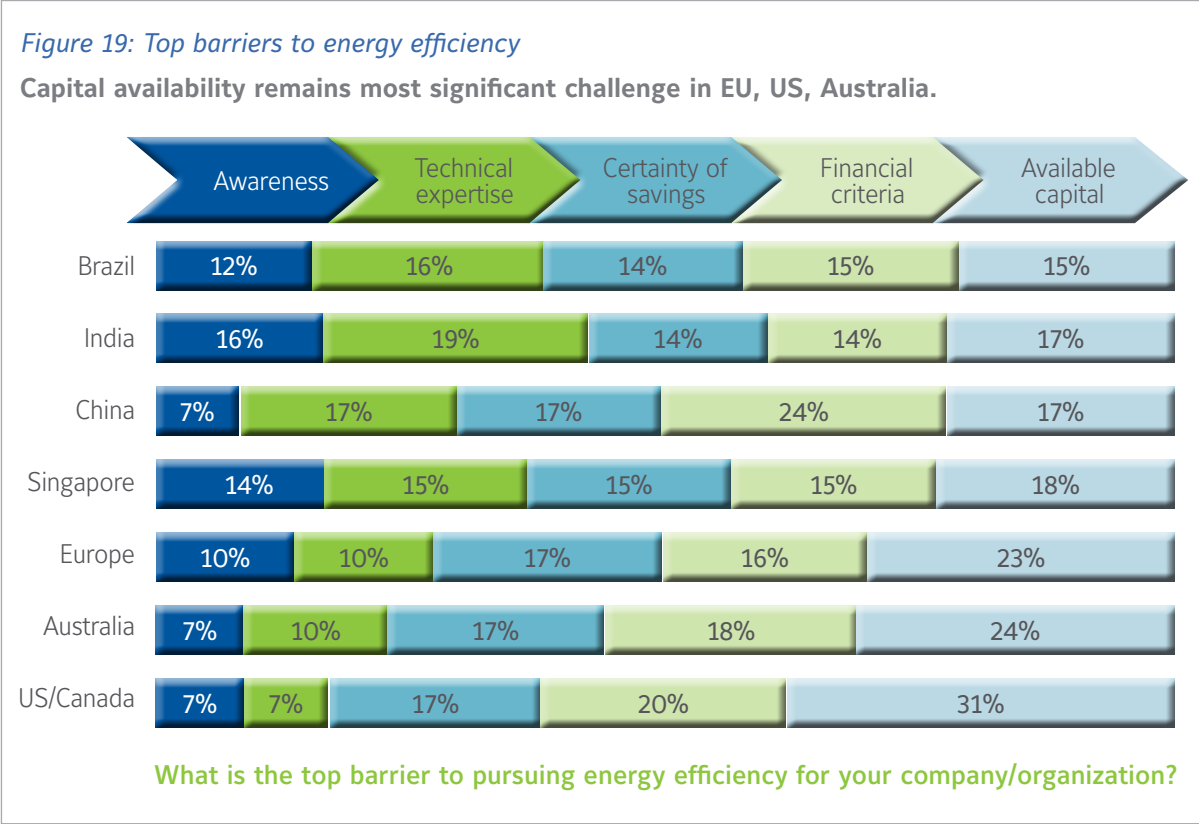
### 3. INVESTMENT LEVELS AND BARRIERS TO ENERGY EFFICIENCY

On energy efficiency investments, the survey results indicated a split between decision-makers' intentions and their organizations' actions. As in 2012, a small majority of respondents said they planned to increase investments in efficiency and renewables in the next 12 months. However, the proportion who said they actually had made investments in energy efficiency showed a small, yet statistically significant drop, to 59% in 2013 from 63% in 2012. (Figure 18)





In part, this may be due to constraints they had not anticipated, or competition for capital among facility projects. Each year we ask about the barriers considered to be the most significant constraints on their efforts. (Figure 19)



**Lack of funding remains as the top barrier to investing in energy efficiency**

As in past EEI surveys, respondents cited lack of funding and internal financial criteria as the most important barrier to energy efficiency investments.

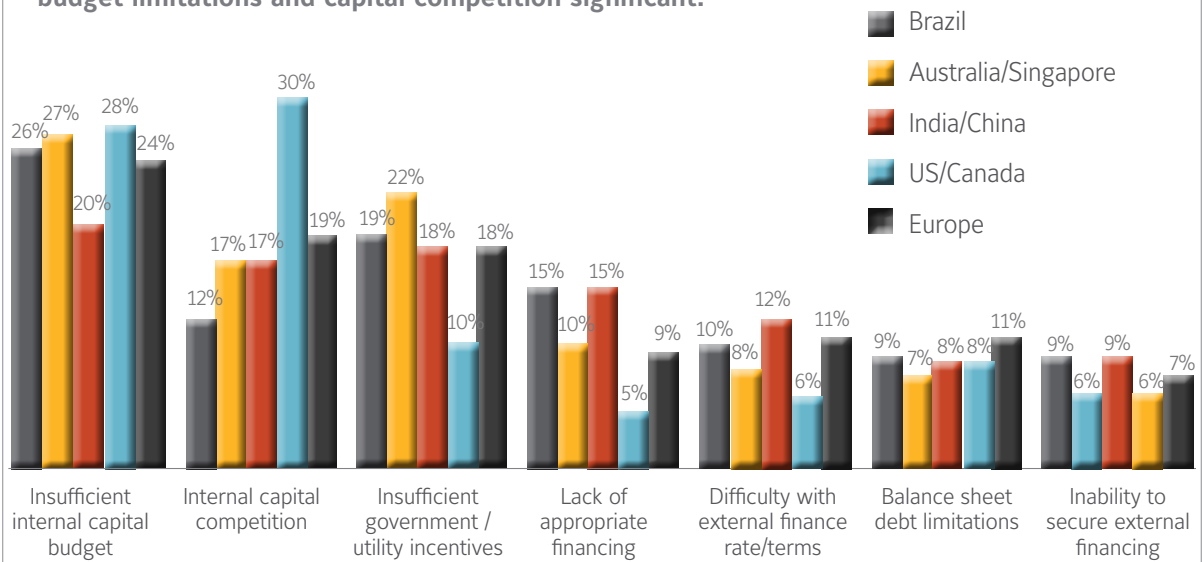
Significantly more respondents in the U.S./Canada (31%) cited capital availability as their top barrier than those in Europe (23%) or other countries. Lack of technical expertise was cited substantially more often in India and China than in Europe (10%) and the U.S./Canada (7%) or Australia.

Recognizing that financial constraints have traditionally been the primary barrier, we ask for further details on what financial barriers in particular impact their investments in energy efficiency (Figure 20). These are: insufficient internal capital budgets, competition for capital against other priorities, and insufficient government or utility incentives. The first two of these were by far the most pronounced in the U.S./Canada with 30% of U.S. executives citing competition for capital as their top financial barrier.

In fact, the dominant financial barriers appeared to remain in the internal funding arena. Yet interestingly, those organizations that had set energy reduction goals and were implementing the most energy efficiency measures were also those who reported utilizing external financing in far greater numbers than other organizations.

Figure 20: Top financial barriers to efficiency investments

Across regions organizations rely on internal funding – budget limitations and capital competition significant.



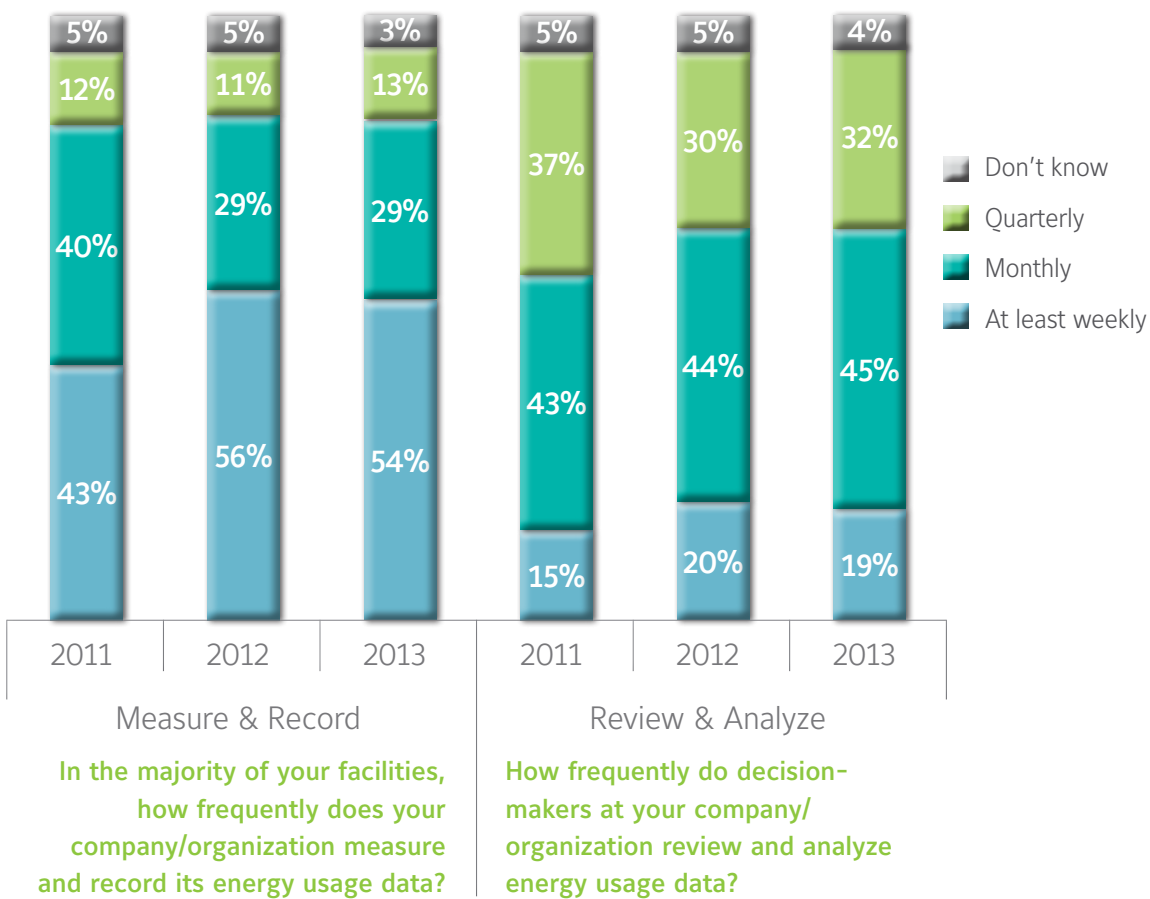
What is the top financial barrier to pursuing energy efficiency for your company/organization?

## 4. BUILDING MANAGEMENT AND PRACTICES

The past decade has brought significant changes in the type, detail and volume of data on energy consumption at the individual device level all the way to the energy performance of building systems. This new “convergence” of information technology and the analysis of “big data” from buildings is one of a number of important trends in energy management. In 2007, when the EEI survey began, we began tracking how frequently energy data was being collected at respondents’ facilities. That year, 88% indicated monthly, with only 9% recording data weekly. In 2010, the frequency began to tick upward with 73% indicated that they record data monthly and 21% said at least weekly. But interestingly, we have not seen a similar rate of growth in those organizations who report analyzing their data more than monthly (this question was added in 2011), and nearly one third of organizations report decision-makers continue to analyze the data on a quarterly basis or less frequently. Energy analysis as a practice may lag behind other management priorities.

Figure 21: Energy data collection and analysis

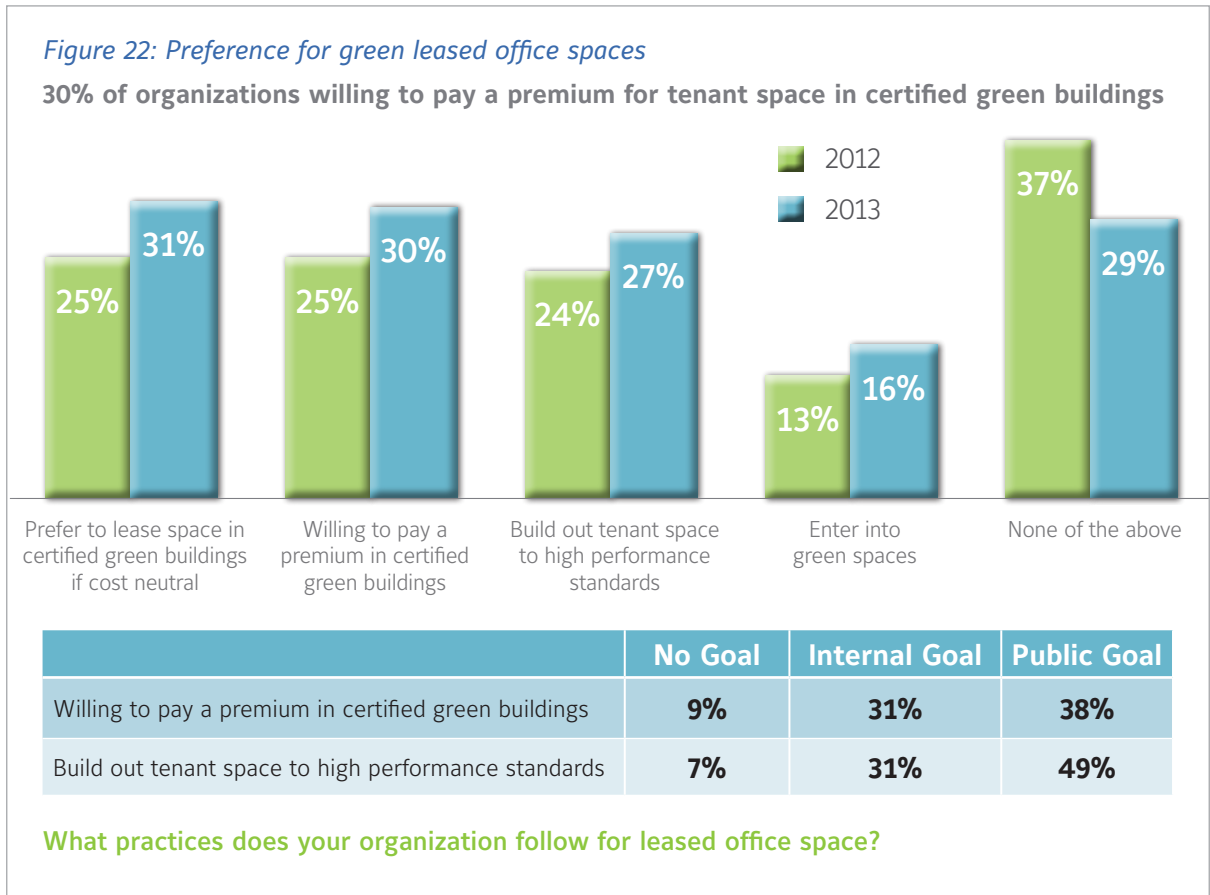
Globally data management practices not showing significant change.



Other aspects of management practice, however, are emerging. Since the survey began, we have asked participants about their green building practices. For the second year, we reviewed how executives viewed their practices in leasing new space.

## Green leased space practices and net zero energy buildings emerging trends.

In 2013, interest in green tenant space practices increased across the board over 2012. More organizations favored leasing space in a certified green building if cost-neutral, paying a premium to lease green building space, building out tenant spaces to high-performance standards, and entering green leases (Figure 22). Furthermore, 73% of respondents said they intended to achieve nearly zero, net zero, or positive energy status for at least one facility in the future.

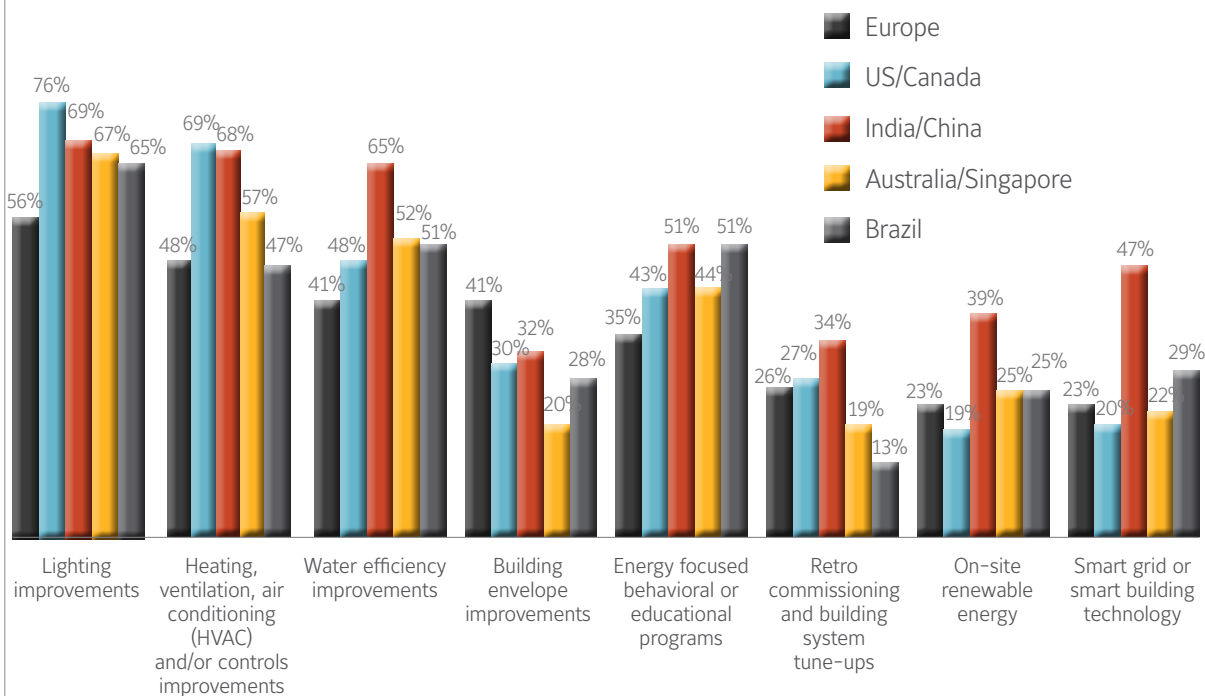


## 5. TECHNOLOGIES AND MEASURES

Lighting and HVAC improvements again ranked as the top two energy efficiency measures being implemented globally. Water efficiency, included in the EEI survey for the first time in 2012, again ranked third this year, and interest was significantly stronger in India and China than elsewhere. India and China also reported significantly higher interest in renewable energy and smart building technologies compared with other countries. Behavioral and educational programs for building occupants focusing on energy were also among the top actions (Figure 23). Europe led the way with deeper building envelope improvements, such as windows and insulation.

**Among energy efficiency measures enacted, water efficiency and behavioral/education programs ranked high.**

*Figure 23: Efficiency and renewable energy measures adopted in last 12 months around the world*  
**Technology measure adopted vary by region – water, HVAC, lighting remain most popular.**

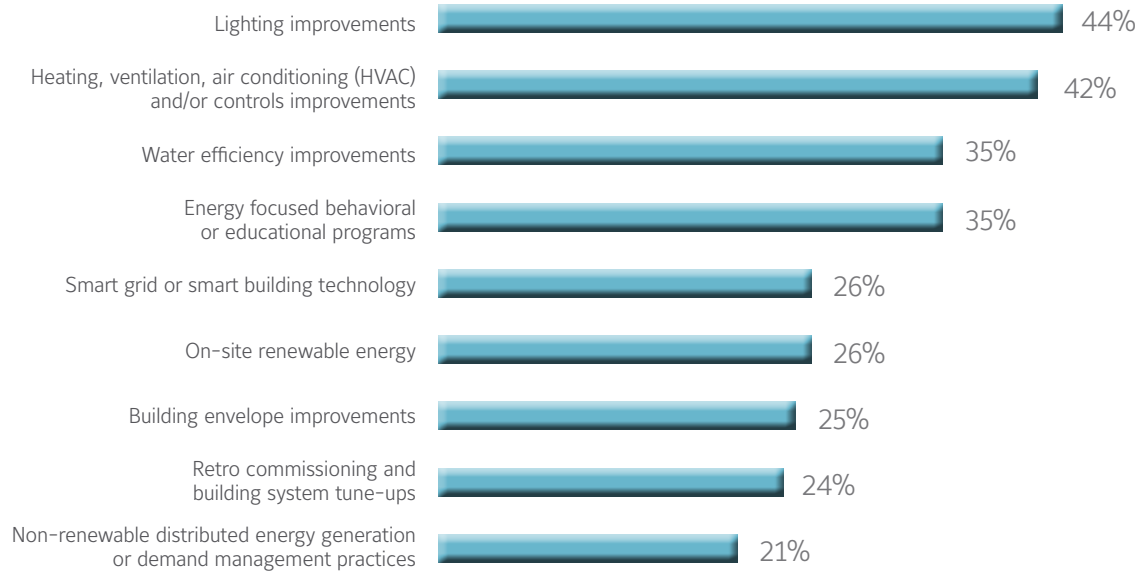


**Which of the following energy efficiency measures has your company/organization adopted in the last 12 months?**

In the next twelve months, investment will continue to focus on these same technologies with the same relative level of importance globally (Figure 24).

*Figure 24: High priority investments*

**High priority investments include water efficiency and behavior programs.**



**What is the relative priority for investment of the following measures over the next 12 months?**

However, respondents from different countries had different perspectives on the energy technologies likely to see increased market adoption over the next decade (Figure 25). Advanced cooling technologies, electric and plug-in vehicles and on-site renewables round out the list of future energy efficiency and renewable energy technologies expected to be adopted around the world. Interestingly, in France, geothermal technology was the second most cited technology for adoption in the next decade – considered more important than lighting and smart building technology. Brazil had the most significant and diverse technology shifts expected – many technologies not widely deployed today received over 20% of respondents indicating they saw new technologies penetrating their market in the next decade.

*Figure 25: Anticipated global technology adoption in the next decade, by market.*

**Markets recognize the need to transition to smarter technology and improved building structures.**

	US/Can	UK	Germany	France	India	China	Australia	Brazil	Singapore
Lighting technologies	54%	40%	33%	22%	23%	36%	36%	35%	46%
Smart building technologies	34%	24%	27%	22%	32%	37%	31%	26%	35%
Advanced building materials	31%	25%	23%	29%	23%	32%	37%	24%	25%
Solar photovoltaics (PV)	22%	21%	32%	26%	28%	35%	25%	26%	26%
Solar thermal		22%	24%	26%	29%	36%	19%	34%	23%
Electric and plug-electric vehicles	23%		25%			26%		22%	19%
Advanced cooling technologies	20%		15%		21%			19%	19%
Small wind generators					19%			21%	
Geothermal / ground source heat pumps				27%					

**Which of the following on-site technologies do you expect to have the greatest increase in market adoption over the next ten years?**

# CONCLUSIONS AND IMPLICATIONS

EI analysis in 2013 shows a variety of promising signs, even while investment has not accelerated as quickly as interest in energy efficiency has grown.

*Figure 26: Summary*

The 2013 survey results **highlight five key findings** based on the input from energy and facility management executives around the world.



In general, these trends were the most pronounced in organizations that have set public energy or carbon reduction goals, as well as those who set internal goals. Those that set goals were also more likely to be motivated by energy efficiency benefits beyond cost savings, and to see value in government policies, which go beyond pure financial incentives.

The proportion of respondents who said their organizations have set energy reduction goals continued to increase, though modestly, in 2013. This trend, if it continues, bodes well for increased investments to improve the energy efficiency and green characteristics of the world's building stock.



# APPENDIX

## 2013 Energy Efficiency Indicator Survey Scope, methodology and respondent profile

The annual Energy Efficiency Indicator is conducted on-line, during five weeks in March and April 2013. Respondents remain anonymous.

To qualify, survey respondents must:

- Have budget responsibility for their organizations' facilities.
- Have duties that include reviewing or monitoring energy usage, and/or proposing or approving initiatives to make those facilities more efficient.

## Geographic distribution

The 2013 survey drew 3,035 responses from facilities executives in these locations:

Location	Share of respondents
U.S./Canada	600
Brazil	233
Europe	929
India	381
China	362
Singapore	202
Australia	301

## Job roles

The survey respondents came from a variety of job titles and functions, but more than half were owners or held vice president or C-level titles.

Title/function	Share of respondents
Owner	20%
C-level	16%
Vice president	20%
Facility manager	19%
Other	25%

## Market sectors

Nearly two-thirds of respondents (65%) represented the commercial building sector, a share 10 percentage points larger than in 2012. The balance were from the industrial (19%) and institutional (16%) sectors.

## Facility size

Respondents had responsibility for a wide range of total facility sizes, but the largest share (42%) had charge of spaces 500,000 square feet/50,000 square meters or larger.

Total space responsibility	Share of respondents
500,000 ft <sup>2</sup> /50,000 m <sup>2</sup> or larger	42%
50,000-499,999 ft <sup>2</sup> / 5,000-49,999 m <sup>2</sup>	38%
Less than 50,000 ft <sup>2</sup> /5,000 m <sup>2</sup>	20%

## EEI SURVEY PARTNERS

The 2013 EEI survey was sponsored by the Institute for Building Efficiency in partnership with the International Facility Management Association, the Urban Land Institute, and our in-country strategic partners.

## THANK YOU TO OUR GLOBAL PARTNERS



## AND OUR IN-COUNTRY STRATEGIC PARTNERS





International Facility Management Association (IFMA) is the world's largest and most widely recognized international association for professional facility managers, supporting more than 19,000 members in 78 countries. For more information, visit the IFMA press room or [www.ifma.org](http://www.ifma.org).

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Urban Land Institute (ULI) is a research and education organization with members in 95 countries, representing the entire spectrum of land use and real estate development disciplines working in private enterprise and public service. For more information, visit [www.ULI.org](http://www.ULI.org).

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The Institute for Building Efficiency is an initiative of Johnson Controls providing information and analysis of technologies, policies, and practices for efficient, high performance buildings and smart energy systems around the world. The Institute leverages the company's 125 years of global experience providing energy efficient solutions for buildings to support and complement the efforts of nonprofit organizations and industry associations. The Institute focuses on practical solutions that are innovative, cost-effective and scalable.



If you are interested in contacting the authors, or engaging with the Institute for Building Efficiency, please email us at: [InstituteforBE@jci.com](mailto:InstituteforBE@jci.com).