DODGE DATA & ANALYTICS

World Green Building Trends 2018:
Australia

Produced in Partnership With:

Carrier

United Technologies

Premier Partners:

The American Institute of Architects

AUTODESK.

Premier Research Partner:

WORLD GREEN BUILDING COUNCIL

Contributing Partner:

U.S. GREEN BUILDING COUNCIL USGBC

■ **Design and Construction Intelligence**

SmartMarket Report

DODGE
DATA & ANALYTICS

About Dodge Data & Analytics

Dodge Data & Analytics is North America's leading provider of analytics and software-based workflow integration solutions for the construction industry. Building product manufacturers, architects, engineers, contractors and service providers leverage Dodge to identify and pursue unseen growth opportunities and execute on those opportunities for enhanced business performance. Whether it's on a local, regional or national level, we make the hidden obvious, empowering our clients to better understand their markets, uncover key relationships, size growth opportunities and pursue those opportunities with success. Our construction project information is the most comprehensive and verified in the industry. We are leveraging our 100-year-old legacy of continuous innovation to help the industry meet the building challenges of the future.

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Introduction

Carrier, its parent company, United Technologies Corporation, and and Dodge Data & Analytics (then known as McGraw Hill Construction) first began collaborating on this research program in 2008 because both companies believed green building was poised to transform construction on a global scale. This 2018 edition of the research demonstrates that their vision has been fulfilled, more than either could have imagined.

This report compares data from the latest study (2018) to previous ones in the series (2012 and 2015), analyzing the level of green activity, the benefits of building green, the triggers most likely to spur further green market growth and the challenges that may impede it.

One of the most encouraging trends is the increasing percentage of respondents who expect to do the majority of their projects (more than 60%) green in most of the 20 countries/regions included in this study. The global average for this group is expected to increase from 27% to 47% between 2018 and 2021, and in about half of the locations, the percentage who expect they will be doing the majority of their projects green by 2021 is expected to double. This trend analysis clearly demonstrates increasing global commitments to building green.

This year's study also features a deep look into the importance of healthier buildings as an element of green building.

Findings validate its importance globally, with particular strength in diverse markets like China, Colombia, India, Ireland and South Africa, as well as the US. This is an emerging priority that can be expected to gain increasing traction in future studies.

Consistent with previous studies, the top challenges and triggers vary strongly by market, and thus, each market is analyzed in regional/country sections. Some of these sections compare the 2018 responses to those from 2015, providing a unique vantage point into the priorities and drivers in some of the top green markets in the world.

Among the most compelling elements of the data are the strong business benefits reported for both new green buildings and green renovations/retrofits of existing buildings. The findings since 2012 have clearly demonstrated the value of investing in green. For example, there has been a steady growth since 2012 in the number of owners who see a 10% or greater increase in asset value for new green buildings compared with traditional ones.

We would like to thank Carrier for their partnership on this research since 2008. We also thank the other organizations whose support made this SmartMarket Report possible, including the American Institute of Architects, Autodesk and the US Green Building Council, as well as the efforts of the World Green Building Council in advising on the study and promoting participation among its members.

Chris Nelson
President, Commercial HVAC
Carrier

Chris Nelson leads the global commercial HVAC product and service portfolio for Carrier, part of UTC Climate, Controls & Security, a unit of United Technologies. He is responsible for driving continued product innovation with an unwavering focus on sustainability – from energy-efficient solutions that deliver comfortable, healthy and productive environments to green-certified manufacturing facilities, including the world's first LEED-certified HVAC factory.

Donna Laquidara-Carr, Ph.D., LEED AP
Industry Insights
Research Director
Dodge Data & Analytics

Donna Laquidara-Carr currently provides editorial direction, analysis and content to DD&A's *SmartMarket Reports*. Prior to this position, she worked for nearly 20 years with DD&A's Dodge division, where she gained detailed insight into the construction industry.

Executive Summary

Green building activity continues to grow across the globe, with dramatic increases expected in 20 countries across five continents between now and 2021.
The latest in a series of studies, the findings show great consistency in the benefits derived from green with previous studies in 2012 and 2015, but they also demonstrate the increasing influence of social factors like creating a sense of community, encouraging sustainable business practices and especially improving occupant health and well-being.

Green Building Activity Is Increasing, But Is Not Always Certified

For the first time, global respondents were asked two questions about their level of green activity: the percentage of their projects considered green using a definition provided in the survey, and the percentage of their projects that are or will be certified under a recognized green building system. (See the Methodology on page 75 for the definition provided for green building.)

The chart at right reveals the total share of green projects reported by all global participants in the study currently, and the expected share in three years. **It demonstrates that green building activity will increase, and, even more important, it shows that most of the increase comes from a large percentage of respondents (47%) who believe that they will build the majority of their projects (more than 60%) green by 2021.**

The findings also reveal that some respondents who do the majority of their projects green are not certifying all of those projects. **More important, the gap among those doing the majority of their projects green and those who are actually seeking green certification on the majority of their projects is expected to grow between 2018 and 2021.** This indicates that green activity is expected to exceed certification activity and may suggest that those experienced with green are using certification more strategically.

Growth in Green Driven by Ongoing Strong Business Benefits

The table at right shows the significant operating cost savings, short payback periods and asset value increases achieved from investments in new green buildings and green retrofit projects reported by respondents in the current study and the two previous ones in 2012 and 2015. The savings achieved, the payback periods and the increased asset values are strikingly consistent, despite changes in the number of respondents, in geographies and in global economic conditions over those years. These business benefits form the foundation that helps promote the growth of further green building activity.

Level of Green Building Activity
(According to Global Respondents)

Dodge Data & Analytics, 2018

- ■ 1% to 15% Green Projects
- ■ Exploring (No Green Involvement)
- ■ More Than 60% Green Projects
- ■ 31% to 60% Green Projects
- ■ 16% to 30% Green Projects

2018: 10%, 21%, 22%, 20%, 27%

2021: 7%, 10%, 17%, 19%, 47%
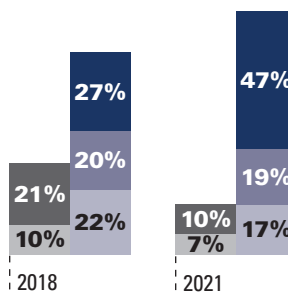
Business Benefits Expected From Green Building Investments
(Medians Reported in 2012, 2015 and 2018)

	New Green Building		
	2012	2015	2018
Decreased 12-Month Operating Costs	8%	9%	8%
Decreased 5-Year Operating Costs	15%	14%	14%
Increased Asset Value (According to Owners)	5%	7%	7%
Payback Time for Green Investments	8 Years	8 Years	7 Years

	Green Retrofit		
	2012	2015	2018
Decreased 12-Month Operating Costs	9%	9%	9%
Decreased 5-Year Operating Costs	13%	13%	13%
Increased Asset Value (According to Owners)	4%	7%	5%
Payback Time for Green Investments	7 Years	6 Years	6 Years

Executive Summary

Client Demands and Environmental Regulations Remain the Top Triggers for Building Green

The current findings, represented in the chart at right, closely echo those of the previous 2015 study. The top triggers demonstrate that the market is pulled by client demand and pushed by environmental regulations globally. However, the importance of these and other triggers vary significantly by country.

Creating Healthier Buildings Is a Priority for Green Building

Creating healthier buildings is also an important trigger for green building globally, especially in Brazil, China, India, South Africa and the US. In addition, improving occupant health ranks first among the social reasons for building green, and the percentage selecting it has jumped 5 points from the 2012 study.

Social Reasons for Building Green Gain in Importance Over Time

Consistent with the 2012 and 2015 studies, respondents in 2018 were asked to rank several social reasons for building green on a one to five scale, from not important to very important. The chart at right shows the percentage who consider several of the reasons provided to be important/very important.

In addition to demonstrating the importance of healthier buildings, the chart shows a general trend of ascribing increased importance to the social reasons for building green over time, especially increasing worker productivity, creating a sense of community and supporting the domestic economy.

Obstacles to Building Green

Respondents citing higher first costs as a top obstacle has dropped from 76% in 2012 to only 49% in 2018. However, despite the drop, it still remains the top barrier in 2018.

Three additional barriers are selected by roughly one third of the respondents: lack of political support or incentives, affordability (green is for high-end projects only) and lack of public awareness. The degree to which each of these barriers is influential varies a great deal by country, suggesting different strategies are needed to promote green globally.
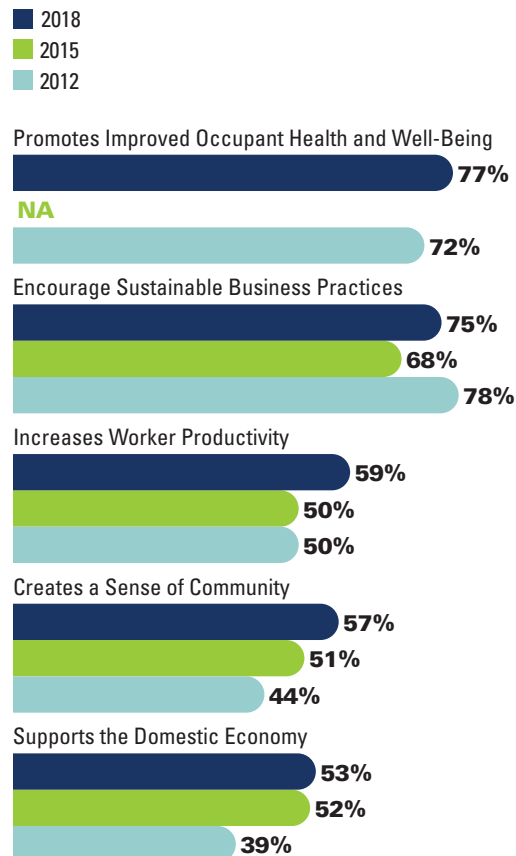
Top Triggers Driving Future Green Building Activity (According to All Global Respondents)

Dodge Data & Analytics, 2018

Client Demands — 34%

Environmental Regulations — 33%

Healthier Buildings — 27%
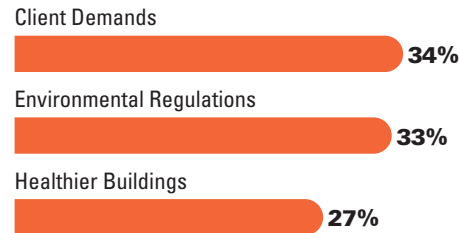
Top Social Reasons for Building Green
(By Percentage of Global Respondents Rating Each Reason as Important)

Dodge Data & Analytics, 2018

- 2018
- 2015
- 2012

Promotes Improved Occupant Health and Well-Being
2018: 77%
2015: NA
2012: 72%

Encourage Sustainable Business Practices
2018: 75%
2015: 68%
2012: 78%

Increases Worker Productivity
2018: 59%
2015: 50%
2012: 50%

Creates a Sense of Community
2018: 57%
2015: 51%
2012: 44%

Supports the Domestic Economy
2018: 53%
2015: 52%
2012: 39%

Green Building Activity and Trends in Australia

Australia currently has one of the most active green building markets in the study, and the level of activity is expected to grow in three years. However, concerns about cost continue to nag this market.

Green Building Market Activity

Australia has a relatively mature green building market currently. Nearly all (94%) of survey respondents do at least some green building projects, and the majority (67%) report at least a moderate level of green activity, with a 30% share or more of their work being green. In fact, nearly half (46%) report that they are doing the majority of their projects (60% or more) green now, the highest of any country included in the survey. This finding may be influenced, however, by the fact that 63% of survey respondents work at companies that are green building council (GBC) members, well above the average for the study.

Respondents are also very enthusiastic about doing even more green projects in the future, with nearly two thirds (64%) who expect by 2021 that they will be doing the majority of their projects green, an 18 percentage point jump from 2018.

Overall, the findings suggest that Australia has a mature, robust and growing market for green buildings.
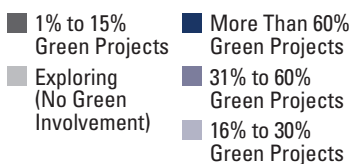
SECTORS WITH EXPECTED GROWTH

Australian responses to the sectors in which they intend to build green projects in the next few years are consistent with the overall global findings, with all categories within a few percentage points of the global averages.

- **The top sector is new commercial buildings, with 54% of respondents.** The percentage of Australians who expect to do green commercial work far exceeds those for any other sector included in the study, and it is double the percentage (27%) who expected to do green commercial projects in 2015.
  - When asked about their overall work, a higher percentage of respondents in 2018 report doing commercial office projects in general in the current study (75%) than in the 2015 one (50%), but this may not entirely account for the increase between 2015 and 2018 of those intending to do green projects in this sector.

Levels of Green Building Activity for Respondents in Australia (2018 and 2021 Expected)

Dodge Data & Analytics, 2018

- ■ 1% to 15% Green Projects
- ■ More Than 60% Green Projects
- ■ Exploring (No Green Involvement)
- ■ 31% to 60% Green Projects
- ■ 16% to 30% Green Projects

	2018	2021
More Than 60%	46%	64%
31% to 60%	21%	11%
16% to 30%	16%	10%
1% to 15%	11%	8%
Exploring	6%	7%

- **Over one third expect to do green institutional projects (39%) and existing building renovations (37%).** Both percentages are higher than those reported in 2015 (30% and 33%, respectively).
- **A lower percentage of respondents in 2018 (25%) report that they will do green low-rise residential projects than in 2015 (39%).** This is despite the fact that the same percentage of respondents in 2015 and 2018 report having done low-rise residential projects in the last three years (57%).
- **One third (33%) of Australian respondents expect to do green high-rise residential projects.** A much higher percentage of the 2018 respondents from Australia (63%) work in this sector than in 2015 (20%), so it is not surprising that this percentage is much higher than the one from 2015 (24%).

Influence Factors for Future Green Building Activity

TRIGGERS

The market has a stronger influence in Australia than other factors, with the top two triggers for future green building being **client and market demands**. Australia is also notably higher than the global average for each of these factors, demonstrating the sway they have on encouraging the green building market in this country.

Australia is slightly lower than the global average for the influence

of **environmental regulation**s, not surprising in a country where market factors are so important. However, it still ranks third in the overall triggers in Australia, demonstrating that regulatory influence still plays a role in helping to drive the market.

The other top triggers, selected by about one quarter, are **doing the right thing** and **healthier buildings**. Both of these are on par with global averages.
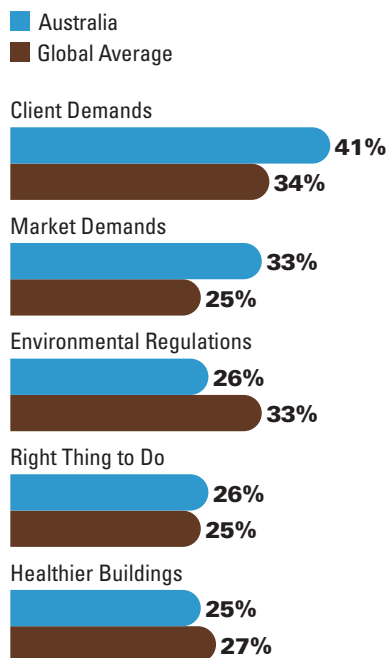
CHALLENGES

Cost concerns continue to be the biggest challenges for building green in Australia.

- **The top challenge, ranked in the top three by 57% of Australian respondents, is higher perceived first costs.** Australia is above the global average in the percentage who rank this a top concern. The persistence of this issue in a country with a mature green market is surprising.
- **Affordability (perception that green is for higher-end projects only) is another top challenge, according to 42% of Australian respondents.** Australia is also the country with the highest level of concern over this issue, as it was in 2015, suggesting that this has been a persistent obstacle to green building for Australians.
- **Other challenges ranked in the top three by one quarter or more Australian respondents are lack of market demand (28%), lack of political support/incentives (28%) and the inability to prove the business case because of the split between capital and operating costs.** All of these align with the overriding concern about the premium cost of building green and the challenge to pay for it.

Top Triggers Driving Future Green Building Activity in Australia

Dodge Data & Analytics, 2018

- ■ Australia
- ■ Global Average

Client Demands
Australia: 41%
Global Average: 34%

Market Demands
Australia: 33%
Global Average: 25%

Environmental Regulations
Australia: 26%
Global Average: 33%

Right Thing to Do
Australia: 26%
Global Average: 25%

Healthier Buildings
Australia: 25%
Global Average: 27%

Social and Environmental Reasons for Building Green

SOCIAL REASONS

Improving occupant health and well-being (75%), **sustainable business practices** (70%), **increasing worker productivity** (59%) and **creating a sense of community** (58%) are all considered important social reasons for building green by over half of Australian respondents.

When asked to select their top reasons, though, the majority select improving occupant health and well-being (79%), and sustainable business practices (59%).

ENVIRONMENTAL REASONS

Lowering green house gas emissions is rated as important by the highest percentage of Australian respondents (75%) among all the environmental reasons for building green. However, when those rating multiple items as important were asked to select their top two, the highest percentage select **reducing energy consumption** (57%), with greenhouse gas reductions a distant second (48%).

Business Benefits

An average of 9% operating cost reductions in the first 12 months for a new green building and 11% for a green retrofit are expected from Australian respondents. The figure for the five-year cost reductions for new green buildings is skewed by the high percentage reporting that they expect more than 15% in that time range. It is notable, though, that the average payback period is lower than in the last study, which may ultimately impact the perception of higher costs.

Expected Business Benefits of Green Building in Australia

	New Green Building		Green Retrofit	
	2015	**2018**	**2015**	**2018**
Decreased Operating Costs Over One Year	**11%**	**9%**	**7%**	**11%**
Decreased Operating Costs Over Five Years	**13%**	**27%**	**13%**	**15%**
Payback Time for Green Investments (Years)	**8**	**7**	**9**	**6**

Methodology:

World Green Building Trends Research

The World Green Building Trends Study was conducted to achieve the following objectives: 1) identify triggers, obstacles and reasons for adopting green building in the domestic marketplace; 2) measure past, current and future levels of activity in green building; 3) identify important construction sectors for growth in green building; 4) measure the impact of green building practices on business operations; 5) profile the use of green building products and/or methods; and 6) uncover trends in the industry through comparison with relevant findings from the 2012 and 2015 Global Trends in Green Building Studies.

The study was conducted between April and June 2018. It was fielded using panel providers, email blasts and association broadcast to members, or by forwarding the link to other groups as follows: 1) multiple Green Building Councils across the world sent email invitations to their members; 2) several associations (AIA, ACE, CIOB, IMEI and USGBC) sent the survey link to members; and 3) the survey was sent to a Dodge Data & Analytics database of industry professionals.

Study Participants

2,078 architects, engineers, contractors, owners, specialists/consultants and investors responded to the survey. All respondents were required to be employed construction professionals and to have non-building projects account for no more than 50% of their office's revenue.

The distribution of respondent is as follows:
- Architect/Design Firm: 25%
- Contractor/Builder: 23%
- Specialist/Consultant: 21%
- Owner/Developer: 18%
- Engineering Firm: 12%
- Investor: 1%

Respondents were located in 86 countries, listed on page 76. Sufficient responses were provided for statistically significant analysis to be conducted for 19 countries, also listed on page 76.

COUNTRIES FEATURED

The percentage of respondents by the countries featured in report are as follows, along with the percentage of respondents from that country who are members of a green building council (GBC)::
- Australia: 5% of total; 63% GBC respondents
- Brazil: 2% of total; 12% GBC
- Canada: 3% of total; 68% GBC
- China Mainland: 2% of total; 14% GBC
- China Hong Kong: 2% of total; 46% GBC
- Colombia: 6% of total; 32% GBC
- Germany: 2% of total; 8% GBC
- India: 19% of total; 51% GBC
- Ireland: 1% of total; 61% GBC
- Mexico: 3% of total; 20% GBC
- Norway: 4% of total; 73% GBC
- Poland: 3% of total; 39% GBC
- Saudi Arabia: 2% of total; 8% GBC
- Singapore: 3% to total; 28% GBC
- South Africa: 4% of total; 52% GBC
- Spain: 1% of total; 65% GBC
- UAE: 2% of total; 48% GBC
- UK: 4% of total; 13% GBC
- US: 16% of total; 53% GBC
- Vietnam: 3% of total; 39% GBC

Benchmark of Accuracy

The total sample size of 2,078 benchmarks at a high degree of accuracy: 95% confidence interval with a margin of error of 2%.

Definition of Green Building

Respondents were asked about their company's level of green activity in two ways: by the share of green certified projects out of their overall work, and by the share of total green projects. For the determination of what qualified as a green building, the following definition was provided:

At a minimum, for a building project to be considered green, it must include the following:
- Efficient use of energy, water and other resources
- Pollution and waste reduction measures, and the enabling of reuse and recycling
- Good indoor environmental air quality
- Consideration of the environment in design, construction and operation

In addition, green building projects include as many of the following as possible:
- Use of renewable energy, such as solar energy
- Use of materials that are non-toxic, ethical and sustainable
- Consideration of the quality of life of occupants in design, construction and operation
- A design that enables adaptation to a changing environment

The results in this report are drawn from survey respondents from the following 86 countries, with statistically significant results on the highlighted 19 countries. See region/country-specific results on pages 46–74.

Afghanistan
Albania
Argentina
Australia
Austria
The Bahamas
Bahrain
Bangladesh
Belgium
Bermuda
Botswana
Brazil
British Indian Ocean
Brunei
Cambodia
Canada
China (Mainland and Hong Kong)
Colombia
Costa Rica
Czech Republic
Democratic People's Republic of Korea

Dominican Republic
El Salvador
Finland
France
Germany
Ghana
Gibraltar
Greece
Guatemala
Guyana
Hungary
India
Indonesia
Iran
Ireland
Israel
Italy
Japan
Jordan
Kenya
Kuwait
Latvia
Lebanon

Lesotho
Malaysia
Malta
Mexico
Moldova
Morocco
Namibia
New Zealand
Nicaragua
Nigeria
Norway
Oman
Palestine
Pakistan
Panama
Peru
Philippines
Poland
Portugal
Puerto Rico
Qatar
Republic of Korea
Romania

Saudi Arabia
Sierra Leone
Singapore
Slovakia
Slovenia
South Africa
Spain
Sri Lanka
Sweden
Switzerland
Trinidad and Tobago
Turkey
Ukraine
United Arab Emirates
United Kingdom
United States
Uruguay
US Virgin Islands
Vietnam
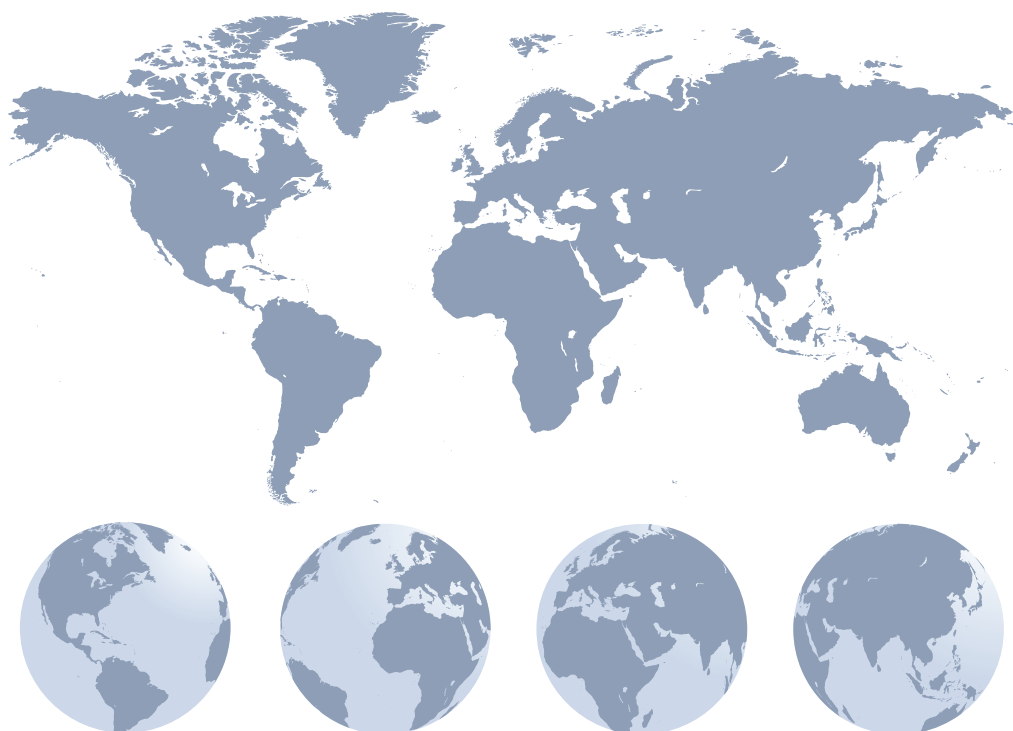
Resources

Organizations and websites that can help you get smarter about global green building trends.

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Dodge Data & Analytics
Main Website: **www.construction.com**
Dodge Global Network:
www.construction.com/products/ dodge-global-network
Research & Analytics:
www.construction.com/products/ dodge-research-analytics
Sweets: **www.construction. com/products/sweets**
SmartMarket Reports:
www.construction.com/ toolkit/reports

Carrier
United Technologies
Carrier
www.carrier.com

The American Institute of Architects
The American Institute of Architects
www.aia.org

AUTODESK.
Autodesk
www.autodesk.com

Contributing Partner

US Green Building Council:
https://new.usgbc.org

Premier Research Partner

World Green Building Council:
www.worldgbc.org

Research Partners

Architects' Council of Europe:
www.ace-cae.eu

The Chartered Institute of Building:
www.ciob.org

La Asociación Mexicana del Edificio Inteligente y Sustentable A.C. (IMEI): **https://imei.org.mx/imei**

Other Resources

Architecture 2030: **https:// architecture2030.org/2030_ challenges/2030-challenge/**

ASHRAE: **www.ashrae.org**

Building Owners and Managers Association International (BOMA): **www.boma.org**

C40 Cities: **www.c40.org**

The Global ESG Benchmark for Real Assets Requirements (GRESB): **https://gresb.com**

International WELL Building Institute: **www.wellcertified.com**

mindful MATERIALS Collabortative: **www.mindfulmaterials.com**

National Institute of Building Sciences: **www.nibs.org**

Organization for Economic Deelopment and Cooperation (OECD): **www.oecd.org**

Resilient Design Institute: **www.resilientdesign.org**

United Nations Framework Convention on Climate Change: **https://unfccc.int**

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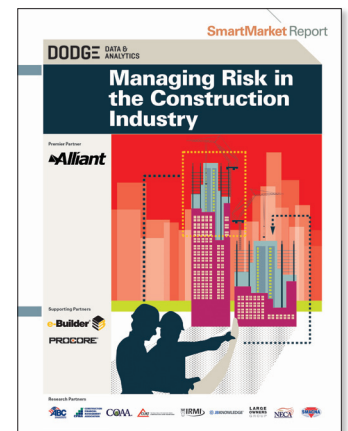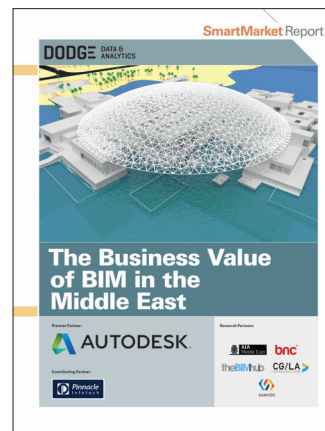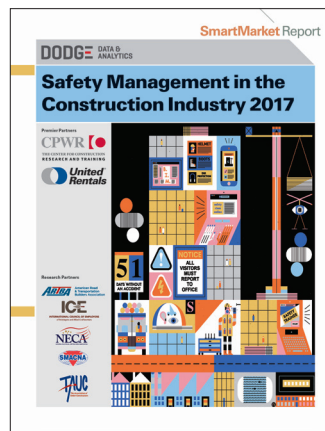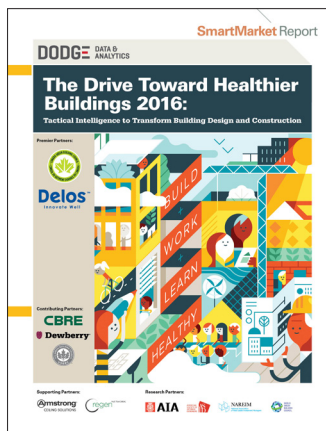
Research Partners:

Participating GBCs:

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