



# THE IMPORTANCE OF RESILIENCE

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IN A CHANGING  
ENVIRONMENT



WE WILL START PROMPTLY AT 12:00PM

U.S. DEPARTMENT OF  
**ENERGY**



**Presented by**



**Los Angeles  
Department of  
Water & Power**



# Housekeeping

- You'll get slides and recording by Friday
- Attendee lines will be muted
- Submit questions during session via the chat box
- Q&A session at the end of webinar
- Tell us how we did

# Our Speakers



MODERATOR

**David Hodgins**  
*Executive Director*  
LA Better Buildings  
Challenge



SPEAKER

**Dan Winters**  
*Head of Americas*  
GRESB



SPEAKER

**Daniele Horton**  
*Founder & President*  
Verdani Partners



# CONTEXT

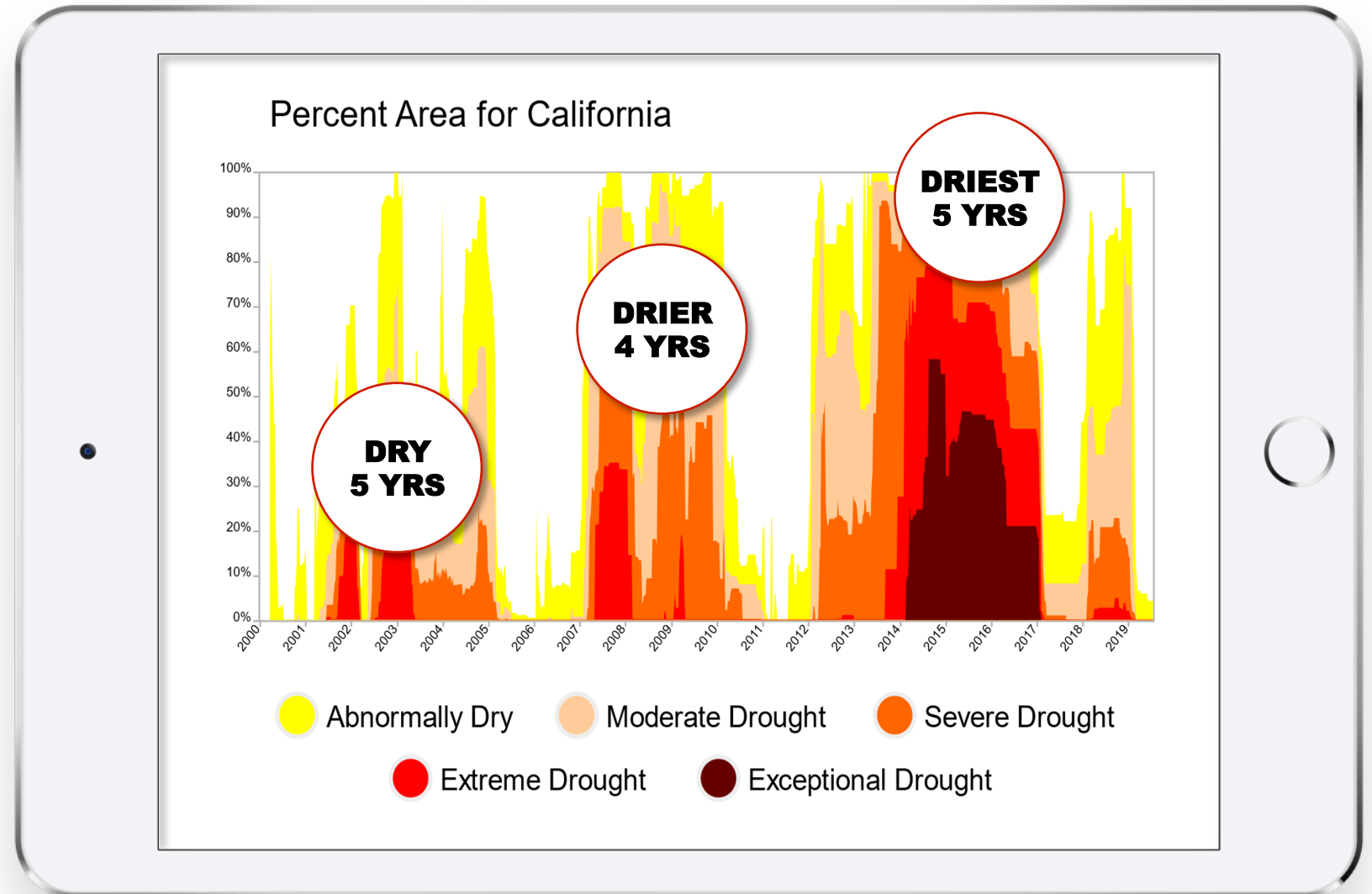
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“Climate change creates new risks and exacerbates existing vulnerabilities in communities across the United States, presenting growing challenges to human health and safety, quality of life, and the rate of economic growth.”

— National Climate Assessment 2018

# California Droughts

- Droughts are cyclical and gaining intensity
- 2015-2019 was the hottest 5-year period on record
- Heat and drought lead to water shortages and wildfires



Source: Drought.gov



# California Fires

**Scorching heat and record droughts have made wildfires more frequent, destructive & costly**

- 2018 wildfire season most destructive & deadliest on record with **8,527 fires** burning **1.9M acres**
- This year, PG&E is conducting voluntary power shut-offs as preventative measure after grid was blamed for starting 13 fires in 2018
  - The first large-scale blackouts affected over 738,000 customers for 48hrs and could cost **\$2.5billion**
- **4.5M** U.S. homes, **2M** in California are identified at high or extreme risk of wildfire





# A City at Risk

As more severe heat waves, droughts, fires, and natural disasters threaten aging power grids and critical infrastructure in Los Angeles, resilience strategies are key to surviving & thriving in the changing environment.







G R E S B<sup>®</sup>

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# LA Better Buildings Challenge

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Webinar :: Resilience

October 2019

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**Assess** and **benchmark** ESG performance of real asset portfolios, providing **standardized** and **validated** data to capital markets.

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# An interactive ESG Data platform



**Institutional  
Investors**

INVESTOR  
PERSPECTIVE

ESG ANALYTICS



**GRESB  
Assessments**

ESG ANALYTICS

ESG PERFORMANCE  
DATA

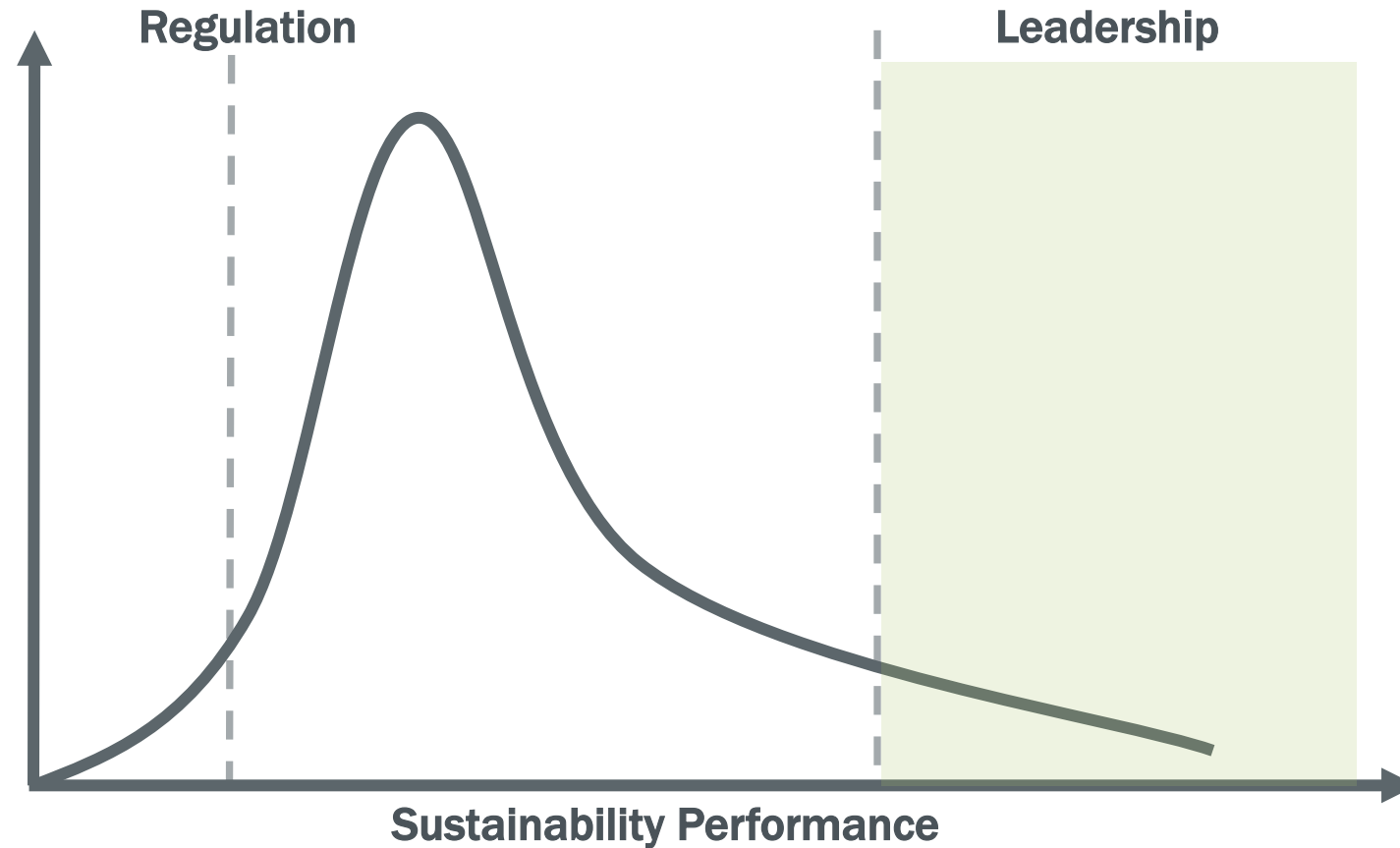


**Fund managers  
Listed companies**



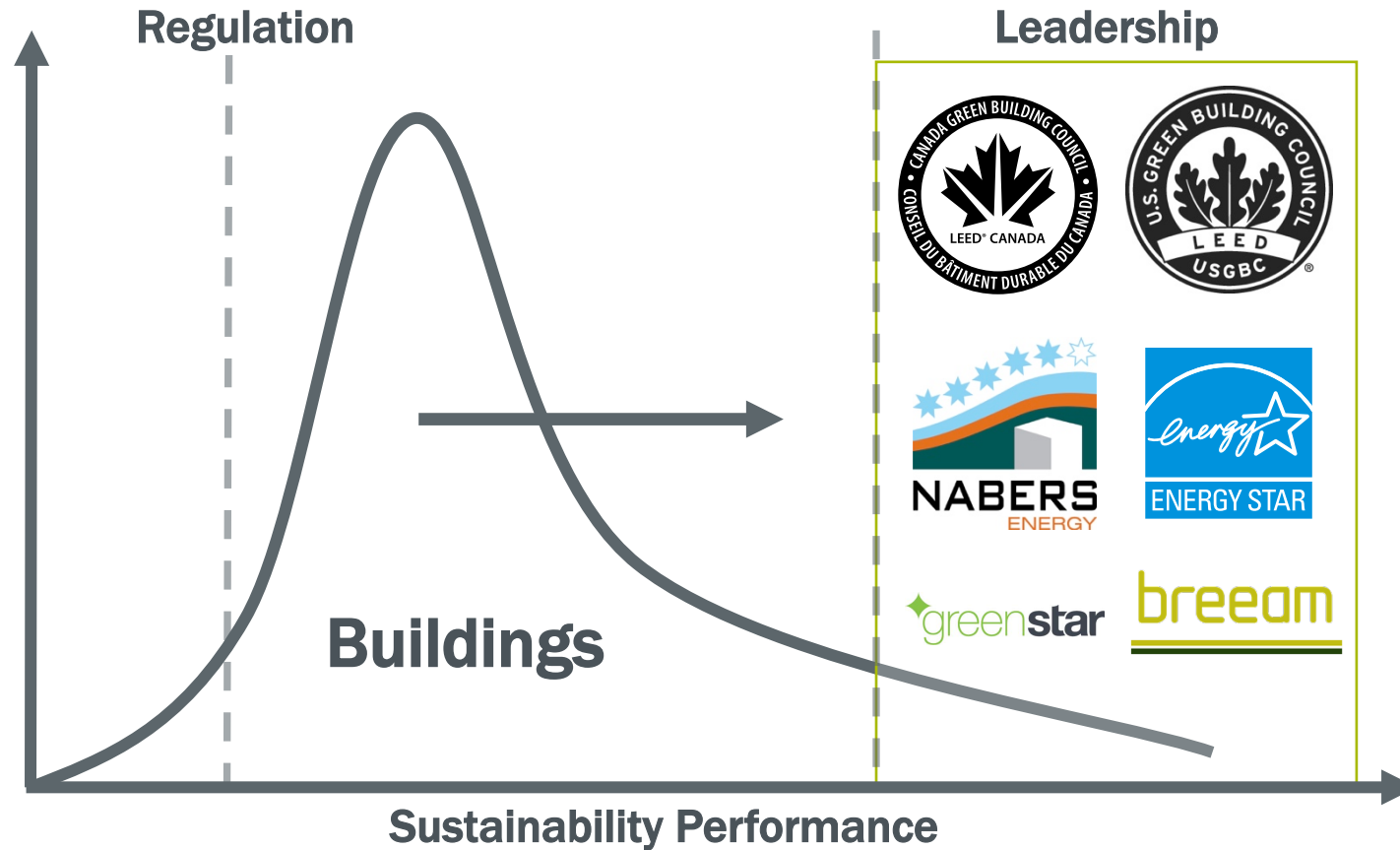
# Market Behavior

Distribution of activity | All economic sectors



# Real Asset Market

Economic signaling





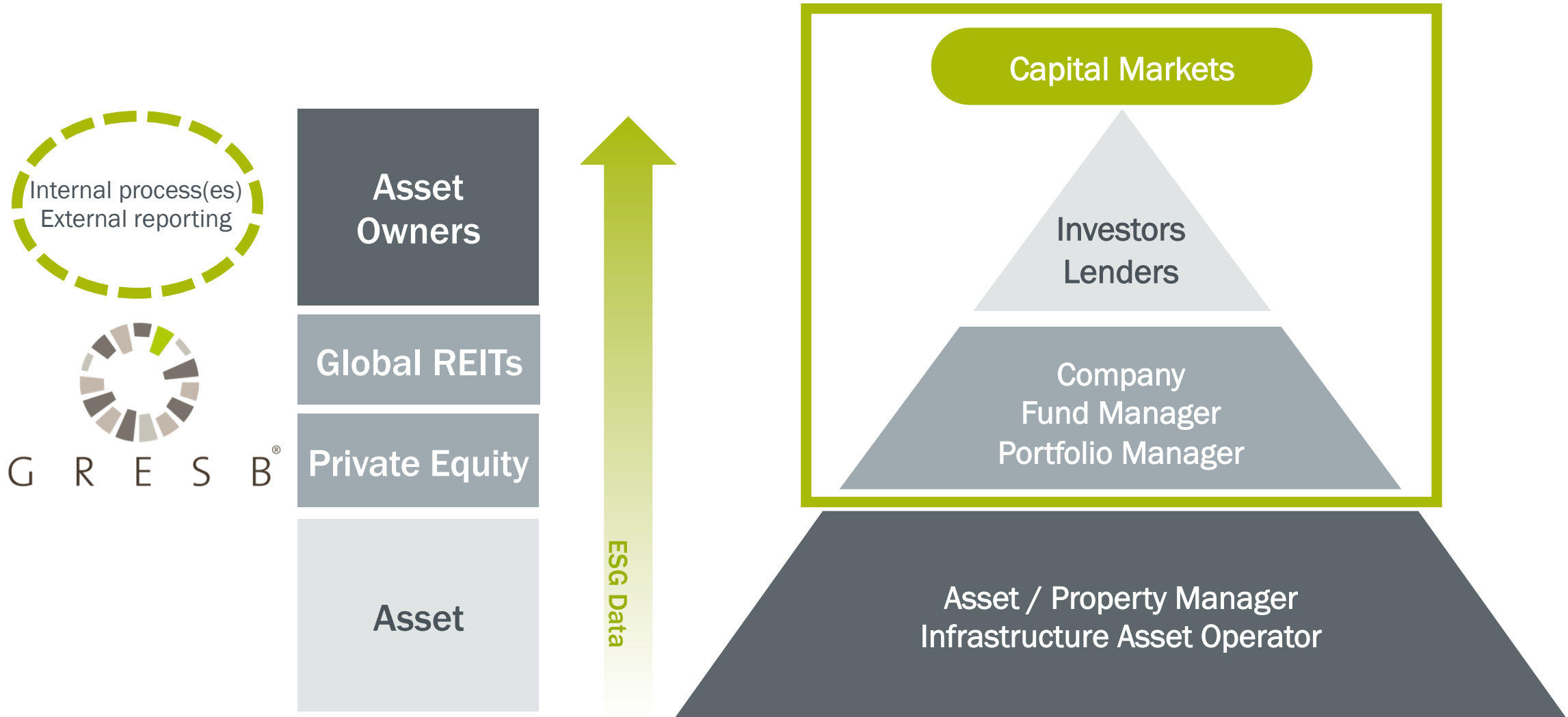
# ESG Information :: Institutional Investors

GRESB Investor Members :: integrate ESG data | utilize GRESB analytic tools



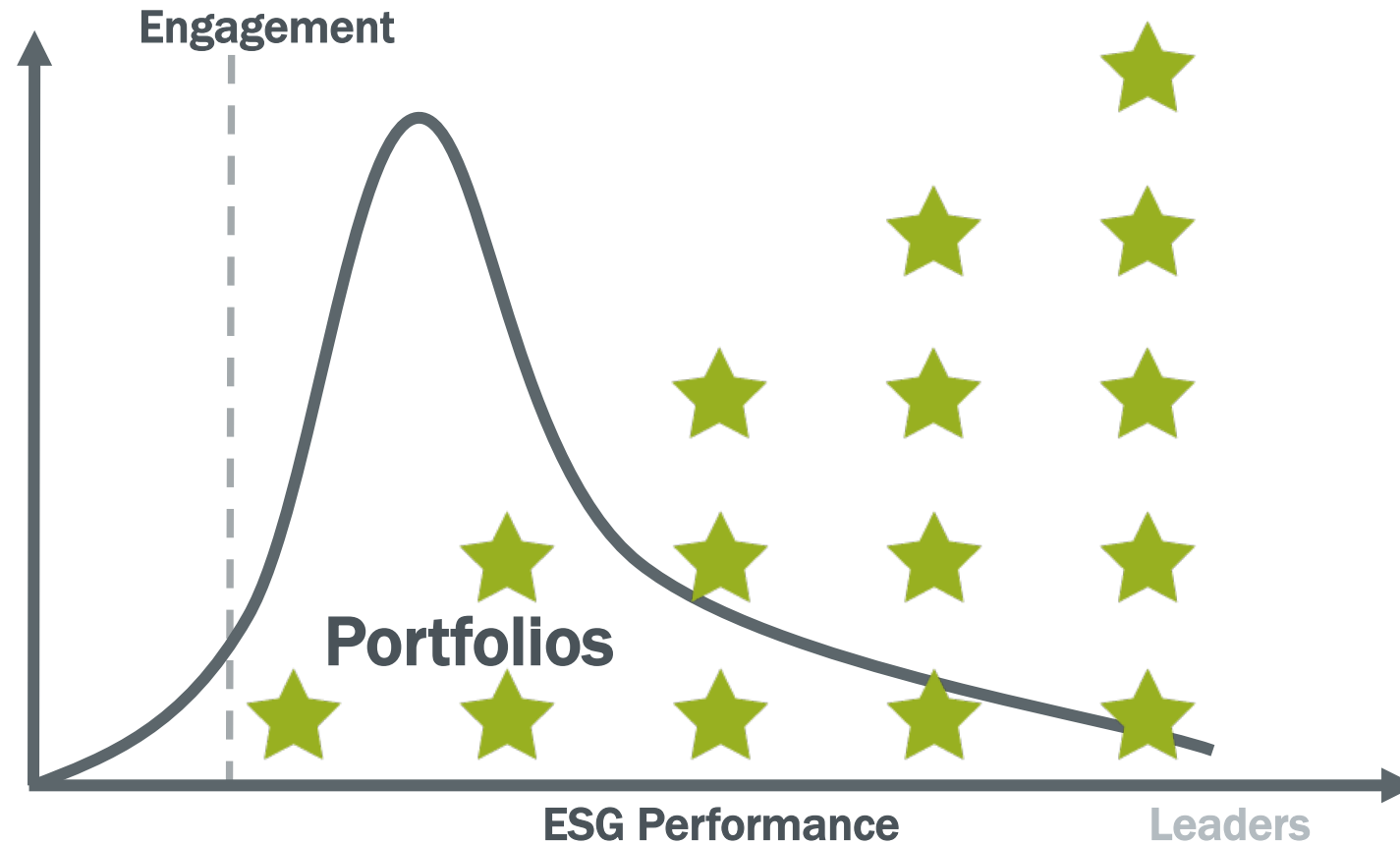
# Real Estate ESG Data Flow

availability | quality | insights | actions



# GRESB Assessments

Private equity funds | Private + Public REITS | Separate accounts | JVs & Club deals





# 10 years of GRESB

2010

2019



US\$

3

Institutional investors

100

\$0.3

Institutional capital (USD tn)

\$22T

3

Industry associations

+40

1

Partners

+50

198

Participants

1,005

0.9

Total property value (USD tn)

\$4.1T

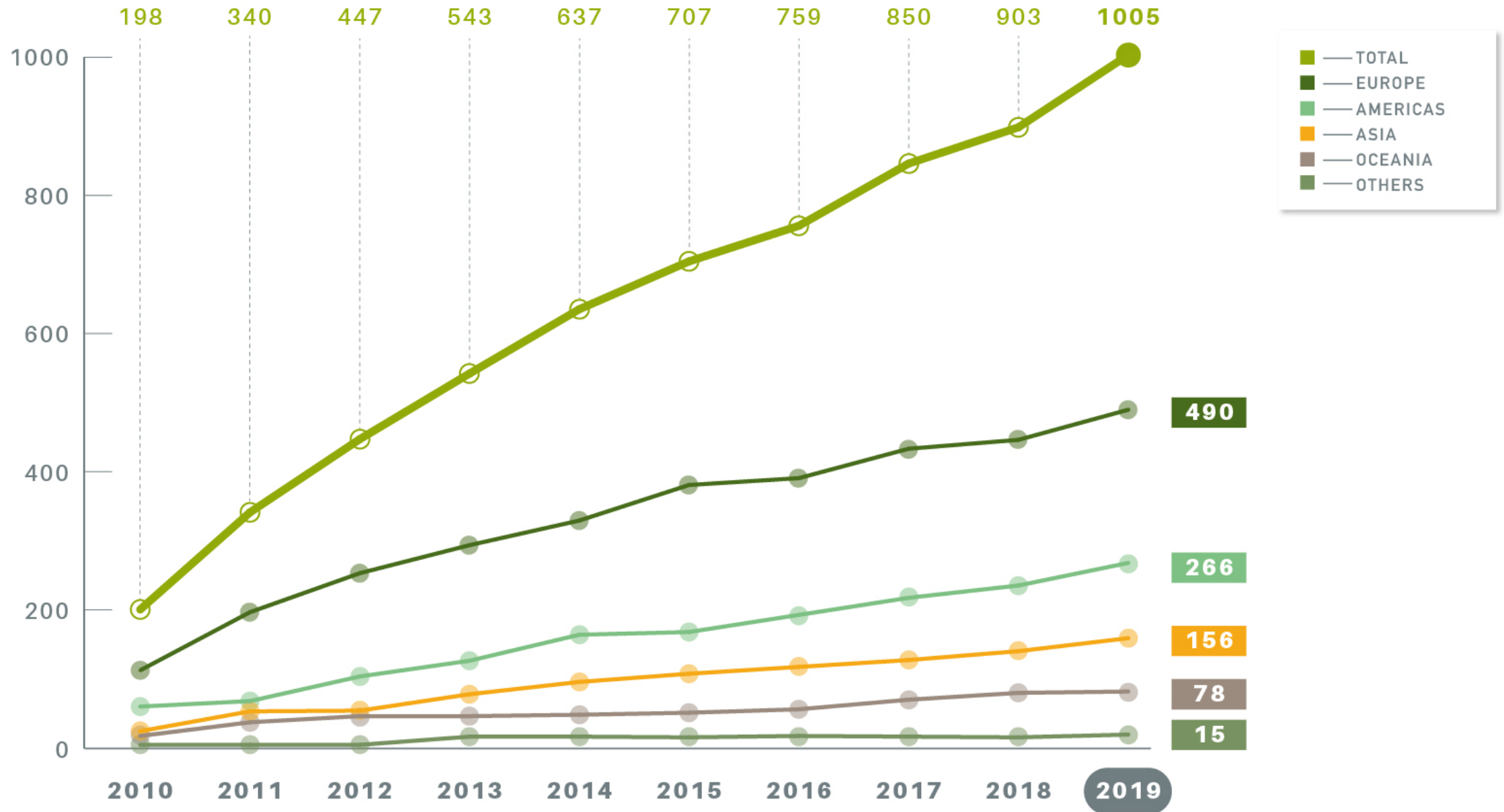
~18,000

Properties covered

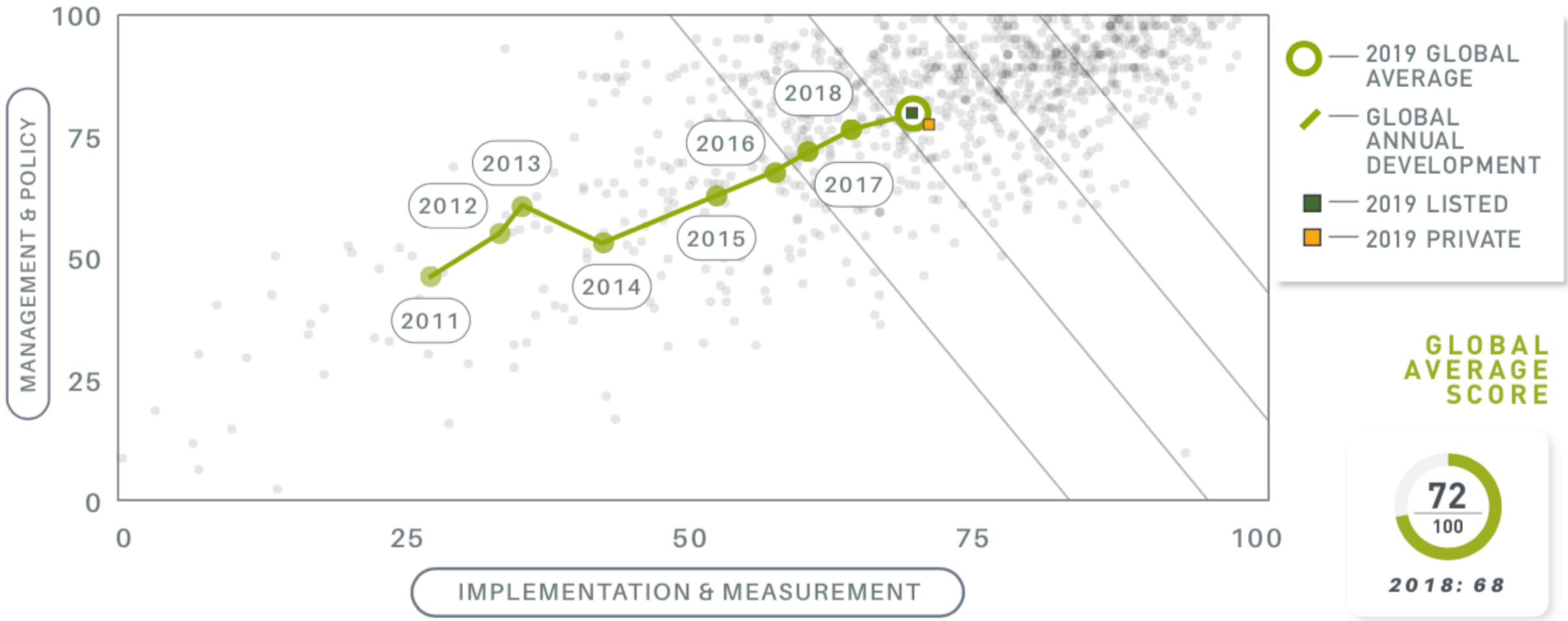
+100,000

0

# Participation Momentum

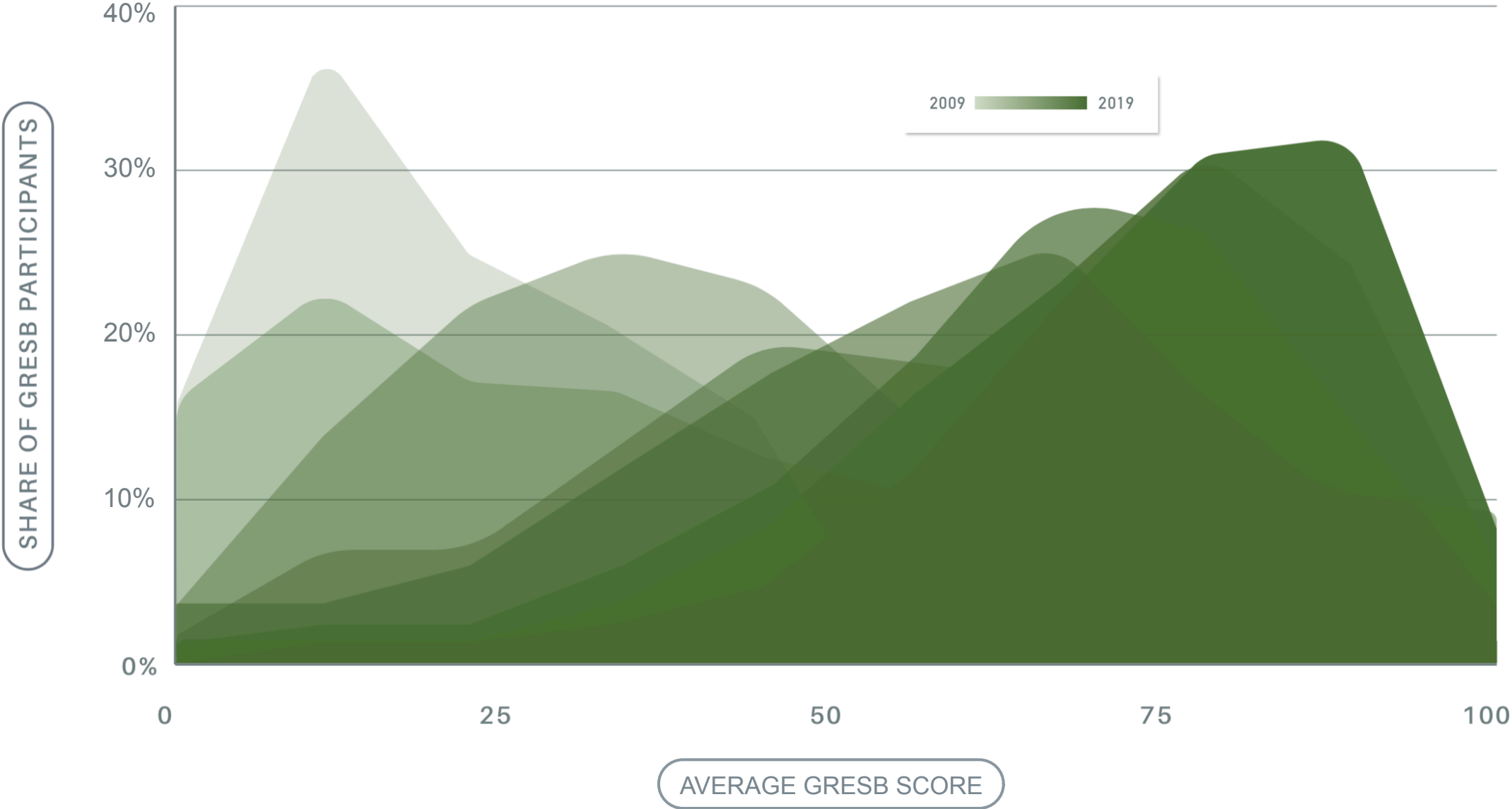


# Industry Progress :: Overall GRESB Scores





# GRESB Scores Distribution



# ESG Data Uses

GRESB scores | aspects | KPIs

## 1. Management Engagement

active strategies



## 2. Full ESG Integration

individual stock valuation  
fundamental analysis



## 3. Positive Screening

best-in-class



## 4. Thematic Strategies

issue-by-issue ESG analysis



## 5. Portfolio Tilt

indices

**S&P Dow Jones  
Indices**

A Division of **S&P Global**

# Investment Spectrum

| Traditional   | Responsible  | Sustainable  | Impact  |  |   | Philanthropy   |
|---|--|--|---|--|---|--|
| Delivering competitive returns  |  |  |   |  |   |  |
| Mitigating ESG risks  |  |  |   |  |   |  |
| Pursuing ESG opportunities  |  |  |   |  |   |  |
| Focusing on (measurable) high-impact solutions  |  |  |   |  |   |  |
| <p>Limited or no regard for environmental, social or governance (ESG) risk management practices</p> | <p>Mitigate risky ESG practices in order to <i>protect value</i></p> | <p>Adopt progressive ESG practices that may <i>enhance value</i></p> | <p>Address societal challenges that generate <i>competitive financial returns</i> for investors</p> | <p>Address societal challenges where returns are as yet unproven</p> | <p>Address societal challenges that require a below-market financial return for investors</p> | <p>Address societal challenges that cannot generate a financial return for investors</p> |



# Investment Spectrum

## The New Paradigm

| Traditional  | Responsible   | Sustainable   |  | Impact  |  | Philanthropy  |
|--|---|---|--|---|--|---|
| Delivering competitive returns   |   |   |  |   |  |   |
| Mitigating ESG risks   |   |   |  |   |  |   |
|  |   | Pursuing ESG opportunities                                    |  |   |  |   |
|  |   |   | Focusing on (measurable) high-impact solutions   |   |  |   |
| Limited or no regard for environmental, social or governance (ESG) risk management practices | Mitigate risky ESG practices in order to <i>protect value</i> | Adopt progressive ESG practices that may <i>enhance value</i> | Address societal challenges that generate <i>competitive financial returns</i> for investors | Address societal challenges where returns are as yet unproven | Address societal challenges that require a below-market financial return for investors | Address societal challenges that cannot generate a financial return for investors |



**Emerging Issue**

# GRESB RESILIENCE MODULE

# Resilience Module

## Structure

A supplement for GRESB Real Estate and GRESB Infrastructure with new indicators addressing:

- Leadership and governance
- Risk management
- Business strategy
- Performance measurement



2019

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## **Resilience Assessment**

# Resilient Organizations

Selected capabilities | competencies

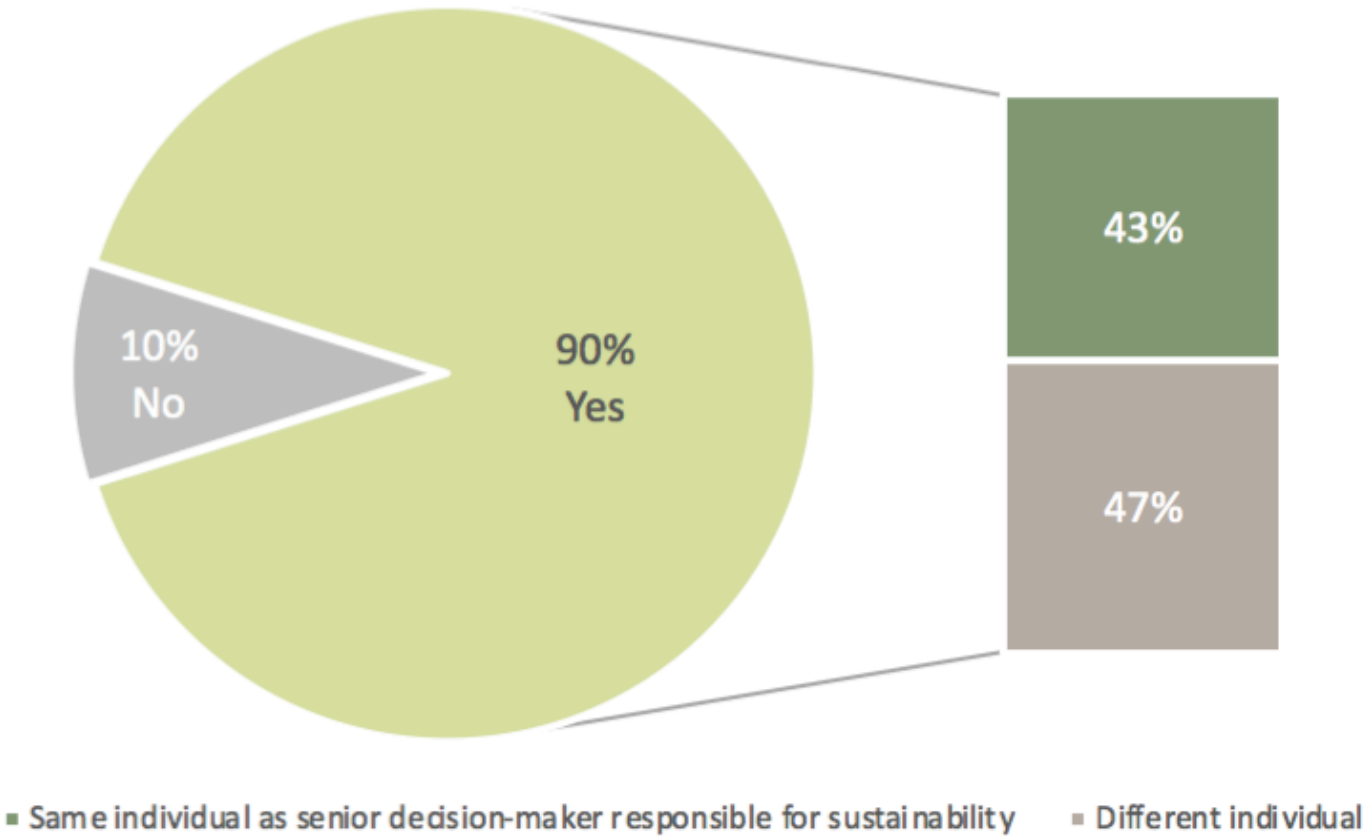
1. Qualified and accountable leadership
2. Clearly defined and empowered internal team
3. Established and tested external partnerships
4. Consistent and relevant risk assessment
5. Aligned business strategy
6. Consistent and responsive communications
7. Timely performance measurement



# Leadership

GRESB participants are taking a variety of actions to institutionalize the governance of climate risk and resilience within their organizations.

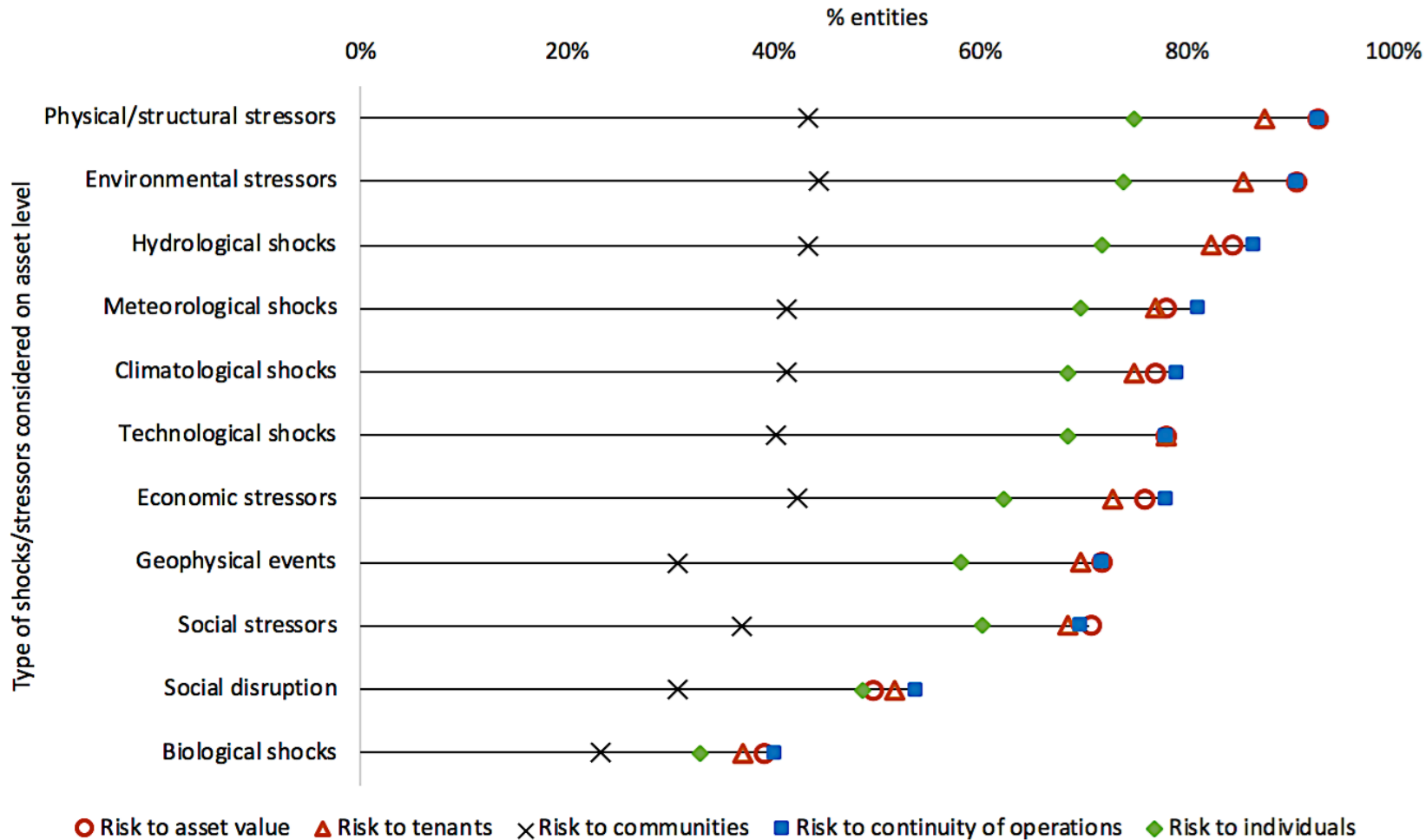
Senior employees responsible for resilience issues





# Risk

More than 90% of GRESB participants report some level of asset-level assessment of physical / environmental stressors





# Resilience & Real Assets

GRESB Special Report - 2018



<https://gresb.com/report-resilience-real-assets/>

# 2019 GRESB Resilience Module

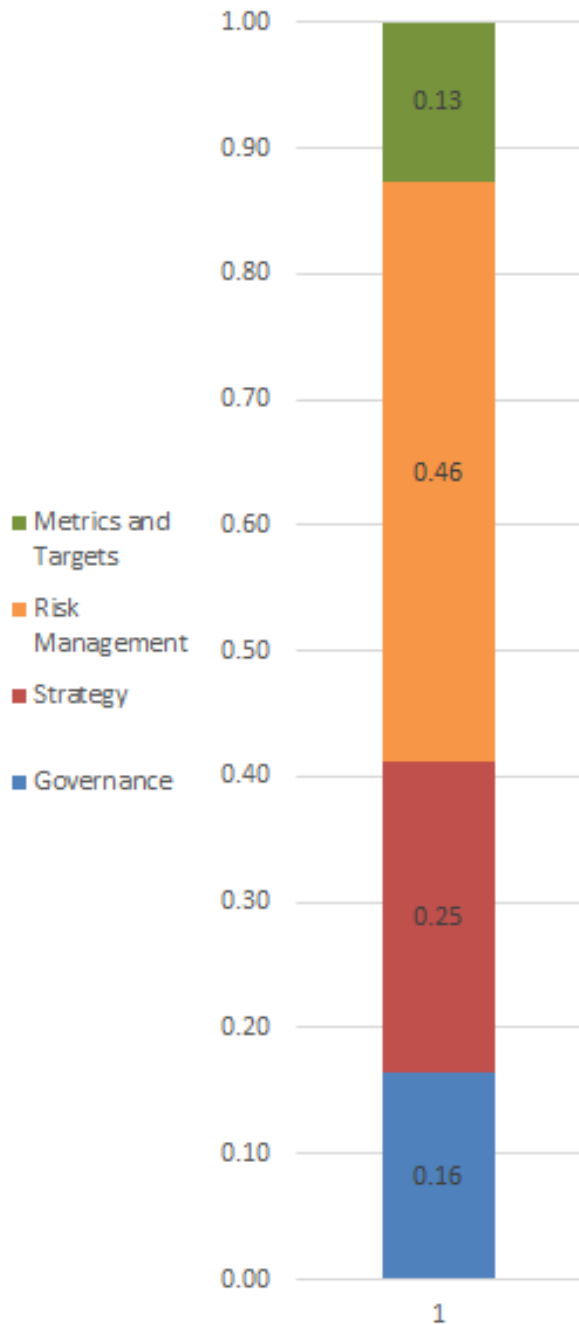
2nd year advancements :

1. Alignment with TCFD recommendations + social factors
2. Separation of risks – transition / physical / social disruptors
3. Reporting on scenario analysis

Resilience-based activities as reported by 316 companies / private equity funds through year-end 2018



Resilience Indicator Breakdown



Distribution of GRESB Resilience Module answer choices by TCFD category:

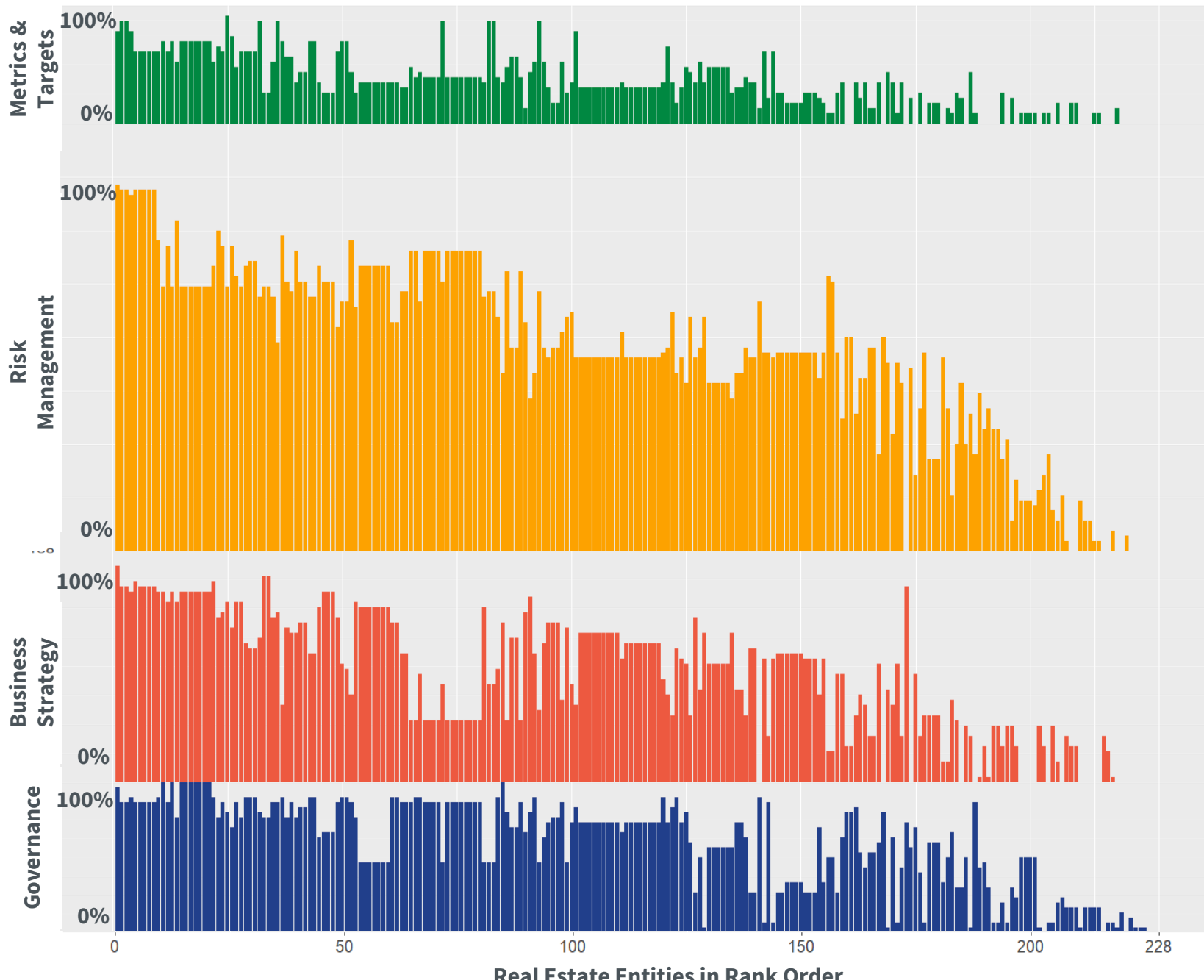
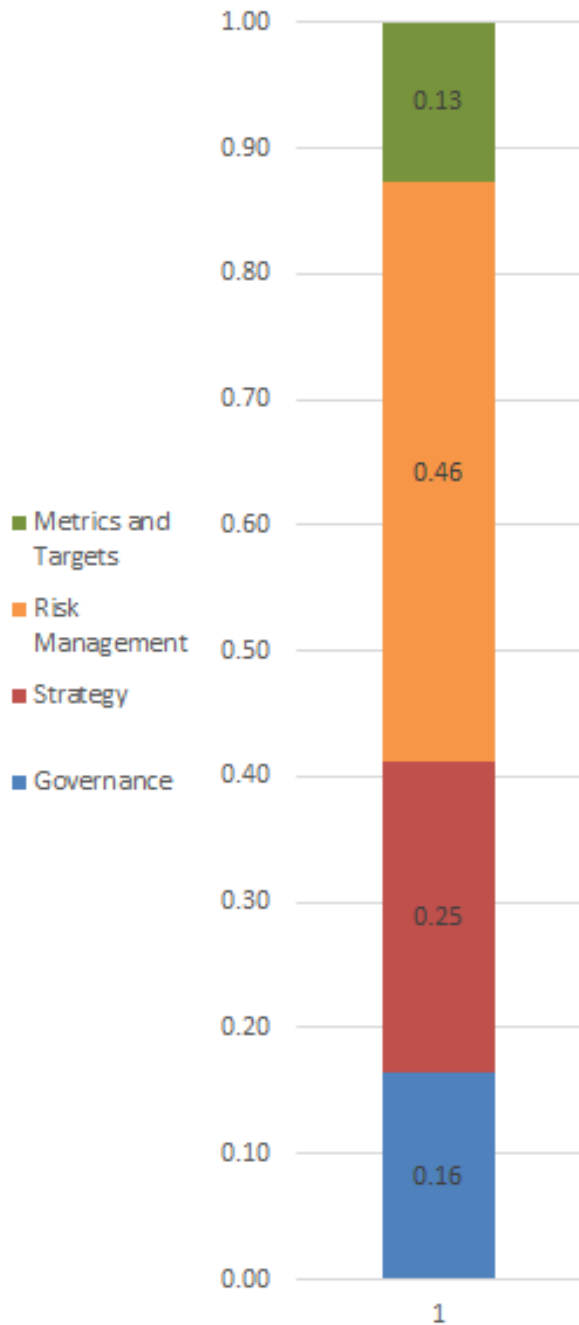
**13%** Metrics and Targets

**46%** Risk Management

**25%** Business Strategy

**16%** Governance

# Resilience Indicator Breakdown





**Dan Winters**

Head of Americas

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# The Importance of Resilience in a Changing Global Environment



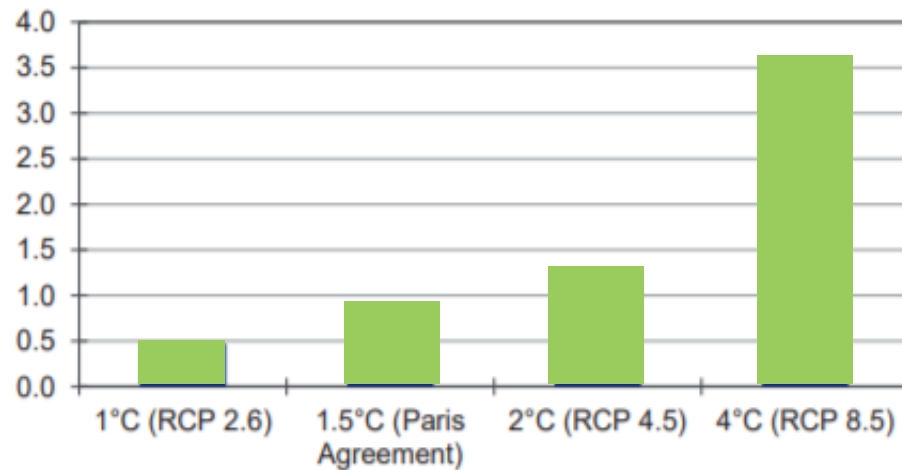
**VERDANI**  
PARTNERS

# Moody's Investor Report Findings

## GDP Damages from Climate Change

The potential for damages across the US from an increase in average temperature, could be as high as 3.5% of GDP in 2100.

Avg annual damage estimates for the U.S. in 2100, % of GDP

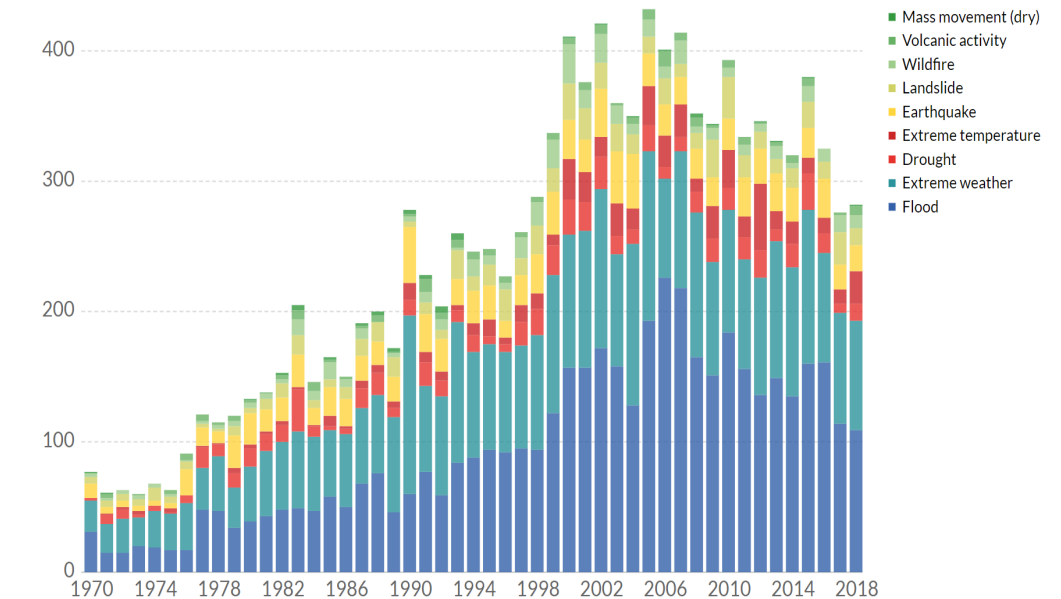


Sources: Hsiang et al. (2017), IPCC, Moody's Analytics

## Global Impact

Most countries will suffer negative deviations, especially in South America, Africa, and across the Asia/Pacific regions.

## Global reported Natural Disasters by Type



Source: EMDAT (2017): OFDA/CRED International Disaster Database, Université catholique de Louvain - Brussels - Belgium

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# Global Resilience Landscape



**C40 Cities Climate Leadership Group's** Climate Positive Development Program launched May 2009.

**U.S. Climate Resilience Toolkit**, called for in the President's Climate Action Plan and developed by the National Oceanic and Atmospheric Administration (NOAA), in collaboration with a number of Federal agencies.



**TCFD** releases recommendations on climate risk and resilience reporting



**Four Twenty Seven** develops framework for assessing local adaptive capacity

- Focuses on awareness, economic and financial characteristics, and quality of adaptation planning and implementation
- Many cities with high exposure to effects of climate change are increasing their resilience



**U.S. Resiliency Council-Rating** Building Performance in natural Disasters, 2011.

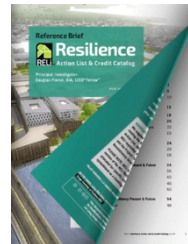


**EcoDistricts**

**EcoDistricts** focuses on Resiliency, Climate Change & Equity in neighborhood communities.



**100 Resilient Cities**—Pioneered by The Rockefeller Foundation (100RC) helps cities become more resilient to the physical, social and economic challenges of the 21st century globally. Closed July 31, 2019.



**RELI: Resilient Design Buildings + Communities-Shock resistant, healthy, adaptable and regenerative communities** through combination of diversity, foresight and capacity for self-organization and learning



**G R E S B**

**GRESB releases Resilience Module**

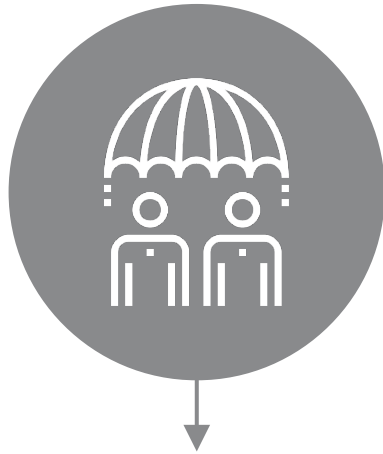
- 316 entities participate in 2019 module
- >90% reported assessing physical risks (up from 80%), >75% reported assessing social risks (up from 50%)
- GRESB participants reduce transition risks by improving energy efficiency, reducing GHG emissions and expanding data coverage

**Verdani Partners** Launches Resilience Risk Assessment Tool



# Resilience Action Plan

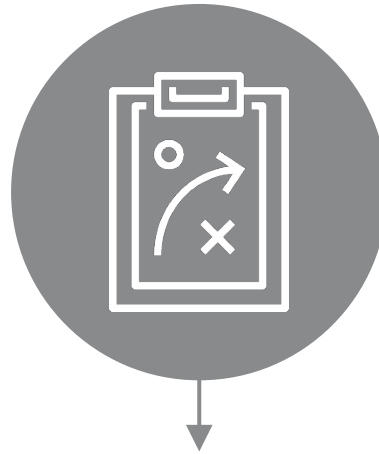
Assess Risk and  
Vulnerability



**Portfolio Risk Assessment**

Physical  
Social  
Transition Risks

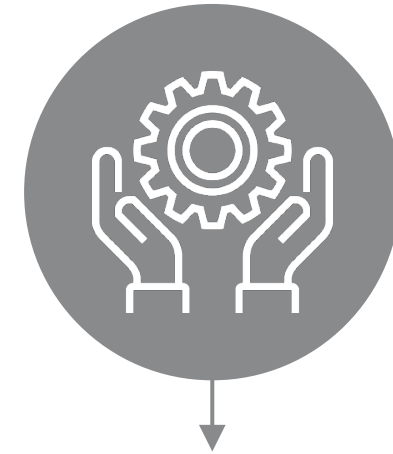
Make a Plan



**Corporate Resilience Policy**

Site  
Structure  
Systems  
Operations  
People

Implement Resilience  
Strategy

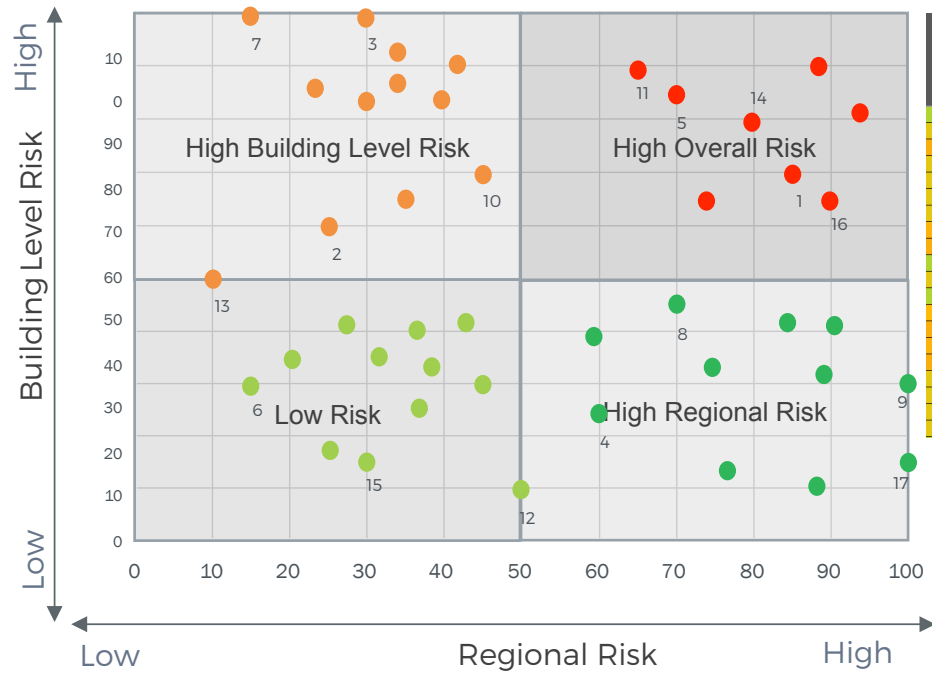


**Property Level Emergency  
Plan**

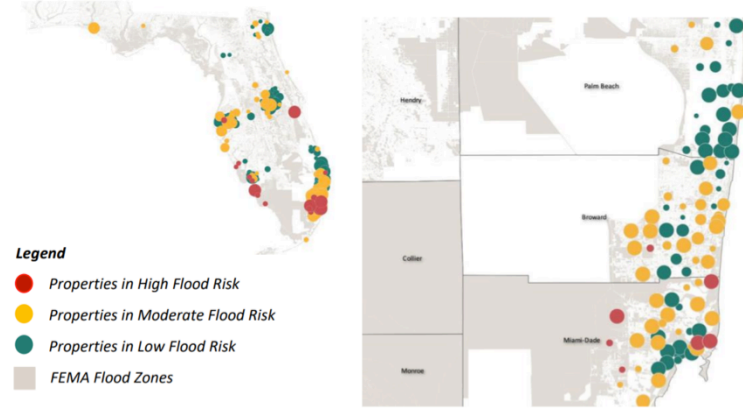
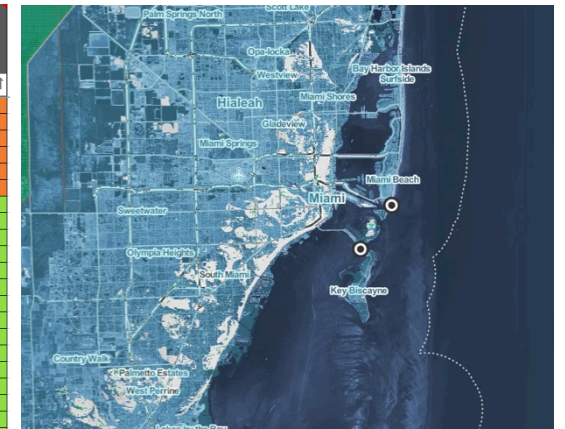
Prepare  
Integrate Resilience Strategy  
Get Insured  
Raise Awareness



# Assess: Physical, Social & Transition Risks



| Billion-Dollar Weather and Climate Disasters (NOAA) | Aqueduct / Water Risk Assessment Score (0-5) | Sea Level Rise 1 ft by 2046-2066 (Climate Central) | Sea Level Rise 2 ft by 2100 (Climate Central) | Sea Level Rise 3 ft by 2100 (Climate Central) | Sea Level Rise 10 ft   Worse Case 2100+ (Climate Central) | Flood Risk (FEMA) (Minimal, Moderate, High) | Sea Level Rise Vulnerability (NOAA) (None, Low, Medium, High) |
|---|--|--|---|---|---|---|---|
| 28  | Low - Medium (1-2)                           | Below water level                                  | Below water level                             | Below water level                             | Below water level   | High  | High  |
| 36  | High (3-4)                                   | None   | None  | None  | None  | Minimal                                     | High  |
| 60  | Low (0-1)                                    | None   | None  | None  | None  | Minimal                                     | High  |
| 36  | High (3-4)                                   | None   | None  | None  | None  | Moderate                                    | High  |
| 36  | Low (0-1)                                    | None   | None  | None  | None  | Moderate                                    | High  |
| 36  | Low (0-1)                                    | None   | None  | None  | None  | Moderate                                    | High  |
| 36  | Low (0-1)                                    | Below water level                                  | Below water level                             | Below water level                             | Below water level   | High  | Low   |
| 55  | Low - Medium (1-2)                           | None   | None  | None  | None  | High  | Low   |
| 60  | Medium - High (2-3)                          | None   | None  | None  | Below but isolated  | Minimal                                     | Low   |
| 28  | Low - Medium (1-2)                           | Below but isolated                                 | Below but isolated                            | Below but isolated                            | Below but isolated  | Minimal                                     | Low   |
| 36  | Extremely High (4-5)                         | None   | None  | None  | Below water level   | Minimal                                     | Low   |
| 28  | Low - Medium (1-2)                           | None   | None  | None  | Below water level   | Minimal                                     | Low   |
| 45  | Low - Medium (1-2)                           | None   | None  | None  | Below water level   | Minimal                                     | Low   |
| 60  | Low (0-1)                                    | None   | None  | None  | Below water level   | Minimal                                     | Low   |
| 55  | Medium - High (2-3)                          | None   | None  | None  | Below water level   | Minimal                                     | Low   |
| 60  | Medium - High (2-3)                          | None   | None  | None  | Below water level   | Minimal                                     | Low   |
| 36  | Extremely High (4-5)                         | None   | None  | None  | None  | Minimal                                     | Low   |
| 36  | High (3-4)                                   | None   | None  | None  | None  | Minimal                                     | Low   |
| 36  | High (3-4)                                   | None   | None  | None  | None  | Minimal                                     | Low   |
| 36  | High (3-4)                                   | None   | None  | None  | None  | Minimal                                     | Low   |



Over 50 risks assessed in Verdani's Resilience Metrics Tool, including physical, social and transition risks.



# Plan: Resilience & Emergency Planning



## SITE

## STRUCTURE

## SYSTEMS

## OPERATIONS

## PEOPLE

- Flood-proof Building Site
- Create Cool Ground Surfaces
- Flood proof Buildings
- Use Hazard Resilient Landscape Design
- Provide Shade
- Stabilize Slopes Susceptible to Erosion, Landslide, Fire
- Use Soft/Green Infrastructure to Prevent Flooding

- Enhance Structural Elements for Extreme Loads
- Use Cool Roofing
- Enhance Building Insulation
- Manage Heat Gain

- Resilient Back-up Power and Systems
- Resilient Heating, Cooling and Ventilation Systems
- Resilient Water Systems During Outages
- Extend Emergency Lighting and Services

- Have Emergency Communications Plans
- Protect Records and Inventory
- Secure Interior Environment
- Train Building/Facility Teams for Resilience Upgrades

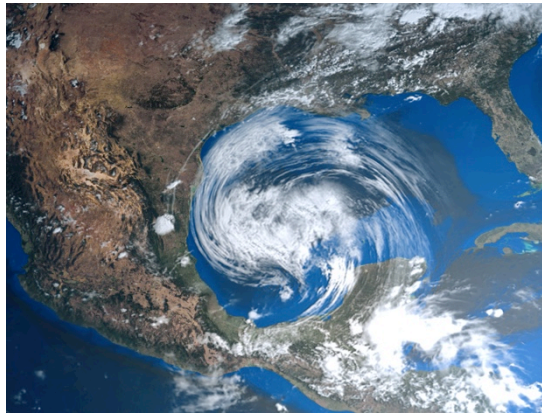
- Locate Vulnerable Populations
- Plan for building occupant Needs





# Implement: Parkway & Hurricane Harvey

Cat 4 Hurricane Harvey



On Site Teams



Dewatering Pumps



Flood Gates



\$125 billion in damage  
No insurance claims for PKY



On site team prevented further  
damages during storm



Previously installed pumps ran  
full time as needed



Installed to protect  
underground spaces






# Regional & Building Level Resilience Solutions





# Q & A



# Upcoming Events



**Nov. 13**  
BOMA W2  
Challenge Case  
Studies



**Jan. 22**  
The Role of Energy  
Efficiency in  
Decarbonizing the Grid



**April 1, 2020**  
6<sup>th</sup> Annual Innovation  
Awards



# 6<sup>th</sup> Annual Innovation Awards

- Submit your project today!  
Follow this link to apply:  
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