

# Green Initiative Task Force

ANNUAL REPORT ENDING JUNE 30, 2019

**CALSTRS**  
HOW WILL YOU SPEND YOUR FUTURE?

**In response to California  
Senate Bill 964**

Aligned with the Task  
Force on Climate-Related  
Financial Disclosure  
reporting guidance

GLOBAL  
STEWARDSHIP  
AT WORK

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## CalSTRS Green Initiative Task Force

Annual reporting ending June 30, 2019

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December 15, 2019

Dear Reader:

The increasing importance of understanding how the low-carbon transition will affect investment portfolios has rarely been more evident than today. As a long-term investor, CalSTRS acknowledges the significance of climate-related risks and the complexity of the global economy achieving the Paris Agreement's goals.

We manage a \$240 billion pension fund by allocating capital globally across public and private asset classes while mitigating risks such as flooding, sea level rise, extreme weather and heat stress. We recognize transition risks manifest through climate-related policies and technologies. Our challenge is to best allocate capital in order to provide retirement security for our members and beneficiaries, while also creating solutions to enable future generations to live in an equitable, prosperous, low-carbon world.

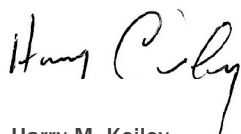
CalSTRS has long advocated for companies to disclose comparable, decision-useful environmental, social, governance and traditional financial information so investors can comprehensively assess risk and properly value investments. We have also advocated for asset managers to integrate climate change considerations into their investment processes and asset valuations. In addition, we have asked governments and regulators to help appropriately price carbon and provide public policies that enable and support an orderly low-carbon transition.

This report highlights our environmentally focused investment efforts. Our climate risk management approach includes how we invest, how we use our influence as a significant global investor and how we disclose our stewardship activities. This report differs significantly from prior years in terms of content and format. In response to California Senate Bill 964 (Allen) (Chapter 731, Statutes of 2018), the content details our analysis of our climate-related financial risks and how we are mitigating them. We also aligned the format with the Task Force on Climate-Related Financial Disclosure framework recommendations. This report is now organized into sections dedicated to our efforts around climate-related governance, strategy and risk management, as well as disclosure on associated metrics and targets.

Looking forward, we will be leading the Teachers' Retirement Board's and the Investment Branch's Low-Carbon Transition Work Plan, a multiyear, fund-wide initiative that will transform our approach to climate risk management. This effort includes understanding the most likely climate transition pathways, positioning our portfolios to be most adaptive and resilient, and identifying opportunities to invest in climate solutions that meet our return expectations. We will continue to collaborate with global peers across the investment industry to engage companies and policy makers to curb emissions and strengthen climate-related disclosures.

Thank you for reading this report. We encourage you to join CalSTRS and our partners in creating the path to a truly sustainable global economy.

Sincerely,



**Harry M. Keiley**  
Teachers' Retirement Board Vice Chair  
Teachers' Retirement Board Investment Committee Chair



**Christopher J. Ailman**  
Chief Investment Officer  
California State Teachers' Retirement System

# INTRODUCTION



## PURPOSE

*The CalSTRS Green Initiative Task Force, the Green Team, is focused on managing sustainability-related risks, including climate risks, and taking advantage of appropriate sustainability-themed investments, including those that support the transition to a low-carbon economy, while providing robust disclosure around our efforts and initiatives to members and strategic partners.*

## CONTENT AND FORMAT UPDATE

CalSTRS continuously looks to improve disclosure around our sustainability-related investment activities that support long-term value creation. We also seek to integrate reporting frameworks that align with our efforts around important strategic issues such as climate change. This edition of the *Green Initiative Task Force* report reflects the desire to be responsive to those who are interested in our investment-related sustainability efforts and to provide data in the most appropriate format.

In response to the request of the California Legislature as described in SB 964 (Allen), we have included additional content that more deeply analyzes our climate risk exposure and describes how we support California's climate goals. The discussion of California's climate goals can be found in the Strategy section and the climate risk exposure analysis can be found in the Risk Management section of this report.

The overall structure of this report differs considerably from previous editions. This year, we align our reporting structure with the guidance of the Task Force on Climate-Related Financial Disclosures. Past editions included support for the TCFD, and since we engage companies on their integration of TCFD guidance, we have aligned our climate-related disclosure with what we believe is the most meaningful and accepted climate framework within the financial markets. To that end, each of the main sections of this report coincide with the TCFD's core elements of recommended climate-related financial disclosures: governance, strategy, risk management, and metrics and targets.

## CORE ELEMENTS OF RECOMMENDED CLIMATE-RELATED FINANCIAL DISCLOSURES

### GOVERNANCE

The organization's governance around climate-related risks and opportunities.

### STRATEGY

The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy and financial planning.

### RISK MANAGEMENT

The processes used by the organizations to identify, assess and manage climate-related risks.

### METRICS AND TARGETS

The metrics and targets used to assess and manage relevant climate-related risks and opportunities.

# GOVERNANCE



*The Teachers' Retirement Board has sole and exclusive fiduciary responsibility to administer the investment assets in a manner that will assure the prompt delivery of benefits and related services to plan participants and their beneficiaries. The Teachers' Retirement Board Investment Committee has established core tenets in the form of investment beliefs that provide a broad framework for the CalSTRS Investment Policy and Management Plan and all investment policies.*

# BOARD OVERSIGHT

The CalSTRS Investment Portfolio is governed by:



CalSTRS investment policies are designed to mitigate strategic investment and implementation risks of investment activity. Since the CalSTRS Investment Portfolio operates in a complex global environment where environmental, social and governance risks can materially impact investment portfolio performance, the Teachers' Retirement Board expects staff to select investments and conduct investment activities after careful consideration of risks, including ESG risks, most impactful to the fund.

CalSTRS has eight investment beliefs, including a specific belief on corporate governance and environmental, social and governance factors.

### Belief 7

Responsible corporate governance, including the management of environmental, social and governance factors, can benefit long-term investors like CalSTRS.

## CALSTRS ESG RISK POLICY

Consistent with CalSTRS' fiduciary responsibility to our members, the Teachers' Retirement Board board has a responsibility to ensure the corporations and entities in which we invest strive for long-term sustainability in their operations in order to achieve the long-term rate of return the fund needs to meet our obligations to our members. To help manage these risks, the board developed its Investment Policy for Mitigating Environmental, Social and Governance Risks.

This policy was adopted in 2008 and revised in 2018, and replaces the CalSTRS Statement of Investment Responsibility, created in 1978, as the preeminent policy on ESG matters. This policy identifies 25 ESG-related risks that staff and partners are to consider when making investment decisions. The policy also provides procedures for the Investments Branch staff, the chief investment officer and the Teachers' Retirement Board Investment Committee to follow when faced with a decision or other activity that potentially violates the policy. The procedures call for a thorough staff analysis of the potential ESG violation and its ramifications to the Investment Portfolio as well as disclosure to the board as to the findings of the investigation and analysis. The Investment Committee can then direct further actions.

*Climate change risk factor: An investment's long-term profitability from inadequate attention to the impacts of climate change, including attention to relevant climate policy considerations and emerging climate risk mitigating technologies.*

## CORPORATE GOVERNANCE PRINCIPLES

The Teachers' Retirement Board is charged with maintaining a strong, stable fund in order to meet CalSTRS' obligations to our members and beneficiaries. To fulfill that responsibility, the board oversees the Investments staff who are responsible for the day-to-day management of the portfolio. CalSTRS believes an essential part of portfolio management is attention to good governance practices. We work to establish good governance policies and practices at the companies we invest in through our corporate engagement efforts and proxy voting activities.

To guide staff in their engagement and voting efforts, the board has developed [Corporate Governance Principles](#). These principles also provide guidance around how to consider ESG issues such as climate change when engaging

companies and voting corporate proxies. Companies are believed to be in conflict with the principles when their actions could result in undesirable side effects for others, such as inadequate accounting and disclosure of carbon emissions, and failure to adequately reduce carbon emissions.

The Corporate Governance Principles also identify ESG integration actions that we are committed to, which include participating in the development of policies and regulations, filing shareholder resolutions consistent with long-term ESG considerations, seeking standardized reporting by corporations on ESG issues, and participating in collaborative engagement initiatives with other shareholders.



## LOW-CARBON TRANSITION AS A BOARD PRIORITY

In May 2019, as enhanced evidence of the Teachers' Retirement Board's commitment to managing climate risk and recognition that action around climate risk management is accelerating, the Investment Committee acted to approve new policy language that codifies their belief that global financial markets are responding to climate risk and that a transformation to a low-carbon economy is underway.

Reflecting CalSTRS' determination that the low-carbon transition is an urgent priority, the board has recently embarked on a Low-Carbon Transition Work Plan to establish a consensus among the board and staff around how the low-carbon transition will impact the Investment Portfolio, analyze the transition readiness of the portfolio, expand stewardship activities that support an orderly transition, and continue our commitment to report and communicate actions around the low-carbon transition.



# IMPLEMENTATION

The Teachers' Retirement Board establishes beliefs, policies and priorities around integrating ESG considerations, such as climate change, and provides oversight of staff who are responsible for executing the board's mission and strategies. Through the direction and leadership of the CalSTRS chief investment officer, staff works collectively and collaboratively to manage climate change and other ESG risks.

CalSTRS has established several cross-asset class teams to implement the board's goals around ESG, including goals related to climate change, risk management and opportunity capture. We believe a team-based approach allows for the sharing of experiences and best practices, and allows for each asset class to be directly responsible for ESG integration. These teams include:

## **CalSTRS Chief Investment Officer**

CalSTRS Chief Investment Officer, Christopher J. Ailman, is a strong advocate of integrating ESG risks, such as climate change, into CalSTRS' investment management processes. Ailman sets the example for staff by reinforcing that assessing ESG risks and opportunities related to climate change is a priority. Ailman leads regular ESG training and education for CalSTRS staff and publicly urges other financial market participants to recognize and manage climate-related risks.

## **CalSTRS Green Team**

The CalSTRS Green Team is a cross-asset class committee with the goal of incorporating environmental, including climate-related, considerations into investment risk management and opportunity capture. For additional information about the Green Team, see pages 12 and 37.

## **Sustainable Investments and Stewardship Strategies**

The CalSTRS Sustainable Investments and Stewardship Strategies Unit is responsible for the majority of CalSTRS' stewardship activities, including proxy voting and engagement, around ESG and climate change. SISS oversees a portfolio that invests in sustainability-focused opportunities and serves as an ESG and climate change knowledge center for our asset classes.

## **CalSTRS Committee on Responsible Investment**

The Committee on Responsible Investment, led by CalSTRS' chief investment officer and composed of staff representatives from each asset class, helps the CIO evaluate exposure to ESG-related risks and take appropriate actions to ensure that external and internal managers adhere to CalSTRS' policy surrounding the management of ESG risk exposure.

## **CalSTRS Asset Classes**

Each CalSTRS asset class takes ownership of conducting research and carrying out due diligence as it relates to the incorporation of climate-related risks. Additionally, each asset class works with the SISS Unit for additional climate-related risk integration. Examples of how each asset class integrates climate-related risks, including physical and transition risks, into the investment management process are shown in the Strategy section of this report.

## CALSTRS GREEN TEAM

The CalSTRS Green Team was formed in 2006 in response to a Teachers' Retirement Board directive to begin integrating climate change and environmental risk considerations into CalSTRS' investment management process.

The Green Team includes representatives from each asset class from the Investments Branch. Team members consider and incorporate sustainability-related issues into each respective asset class's portfolio management processes and procedures. Working together, Green Team members are able to share experiences and best practices around environmental risk integration, which facilitates broader integration within the Investments Branch.

In addition to environmental risk integration collaboration, team members hear from industry experts about issues that could impact their respective asset classes at quarterly meetings.

The Green Team works on:

- Integrating environmental-related risks into each asset class's processes and procedures.
- Continuing education on environmental-related risk issues and sustainable-themed investment opportunities.

As part of the initiative of continuing education on climate-related risk issues and sustainable-themed investment opportunities, the Green Team has hosted many industry experts as guest speakers to present to Green Team members and other staff. Some of the organizations that have presented include:

### **Bloomberg** NEW ENERGY FINANCE

Bloomberg New Energy Finance head of Advanced Transport spoke about the future of mobility.

### **Blackstone**

Blackstone head of ESG provided education on how modern slavery affects supply chain management, including the supply chains of industries leading the electrification transition.

### California ISO

California ISO Regional Transmission Engineering lead spoke about current trends in California energy, provided insight on energy spot prices, and discussed how battery and further renewable adoption will affect the grid.

### **CBRE**

CBRE presented on sustainability trends impacting commercial real estate, including risks and mitigating actions.

### Agriculture Capital

Agriculture Capital staff spoke about climate-related risks and water sourcing as they relate to agriculture production with a focus on citrus, hazelnut, blueberry and table grape production.

### **BLUE FOREST** CONSERVATION Financial Innovation for Sustainable Solutions

Staff from Blue Forest Conservation discussed launching the first Forest Resilience Bond, a public-private partnership that leverages private investor capital to finance forest and watershed health in the Tahoe National Forest in 2018.

## CALSTRS COMMITTEE ON RESPONSIBLE INVESTMENT

The CalSTRS ESG risk policy identifies ESG-related risks that could materially impact the value of the Investment Portfolio. These risks could impact a particular asset category, sector or geographic region, or the markets as a whole. Every CalSTRS portfolio manager, whether internal or external, is expected to consider these ESG risks when making investment decisions on behalf of the fund.

CalSTRS staff determined that in order to fulfill our duty to properly integrate the board's ESG risk policy evenly across all asset classes, a team-based approach was necessary. To that end, the Investments Branch established the

Committee on Responsible Investment. The CRI, composed of members from each asset class and chaired by the CIO, is tasked with supporting the CIO's responsibility to thoroughly investigate any potential violation of the ESG risk policy and report potential risk violations to the board.

The CRI meets quarterly and discusses ongoing ESG risks and any new potential violations of policy, and makes recommendations to the CIO around future actions. CRI team members are responsible for ensuring that any relevant CRI initiatives or efforts are brought before their respective asset classes.

## CALSTRS ENVIRONMENTAL, SOCIAL AND GOVERNANCE RISK MANAGEMENT PROCEDURES

When faced with a decision or other activity that potentially violates CalSTRS' ESG Policy, the Investments staff, CIO and Investment Committee will undertake these actions:

- 1 The CIO assesses the potential ESG policy violation both as an ESG risk and as an impact to the CalSTRS Investment Portfolio. The extent of staff's responsibility to devote resources to address these issues is determined by the size of the investment and the gravity of the violation of CalSTRS' ESG policies.
- 2 At the CIO's direction, Investments staff directly engages corporate management or other appropriate parties to seek information and understanding concerning the ESG policy violation and its ramifications on our portfolio.
- 3 The CIO and Investments staff report to the Investment Committee the findings associated with an ESG policy violation engagement and recommend any further engagement or need to commit further portfolio resources. The Investment Committee can marshal further resources depending on the gravity of the situation.

# GOVERNANCE FRAMEWORKS

CalSTRS staff is responsible for implementing the ESG-related policies and directives of the Teachers' Retirement Board. The task of doing this effectively across a complex asset base has been eased by several governance frameworks that have been developed over the past 15 years.



## PRINCIPLES FOR RESPONSIBLE INVESTMENT

The Principles for Responsible Investment were developed in 2006 by an international group of institutional investors reflecting the increasing relevance of environmental, social and governance issues to investment practices. The six Principles are a voluntary and aspirational set of investment principles that offer possible actions for incorporating ESG issues into investments.

In signing the PRI, CalSTRS committed to adopt and implement the six Principles, where consistent with our fiduciary responsibilities. We also committed to evaluating the effectiveness and improving the content of the Principles over time. We believe that by evaluating and reporting on our ESG efforts against the six Principles, we enhance our ability to meet our commitments to beneficiaries and better align our investment activities with the creation of a sustainable global economy.

### PRI Principles

#### Principle 1

We will incorporate ESG issues into investment analysis and decision-making processes.

#### Principle 2

We will be active owners and incorporate ESG issues into our ownership policies and practices.

#### Principle 3

We will seek appropriate disclosure on ESG issues by the entities in which we invest.

#### Principle 4

We will promote acceptance and implementation of the Principles within the investment industry.

#### Principle 5

We will work together to enhance our effectiveness in implementing the Principles.

#### Principle 6

We will each report on our activities and progress toward implementing the Principles.

The PRI also provides CalSTRS with access to global engagement and knowledge-sharing platforms that allow staff to collaborate with other PRI-affiliated shareholders across the world and advance efforts to manage ESG risk through stewardship activities such as corporate engagement and proxy voting.



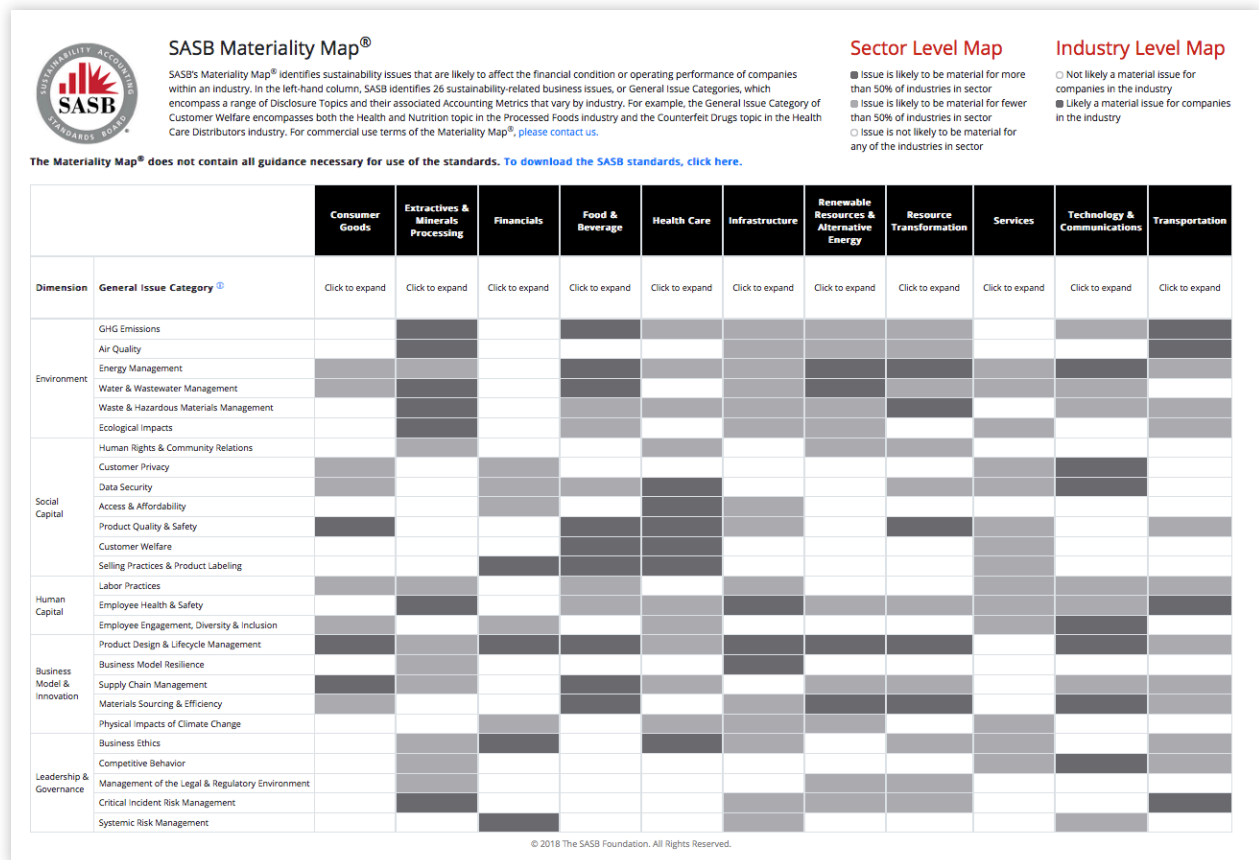
## SUSTAINABILITY ACCOUNTING STANDARDS BOARD

In November 2018, the Sustainability Accounting Standards Board published a complete set of 77 industry standards that articulate material ESG issues on a sector-by-sector basis. These globally applicable industry-specific standards identify the minimal set of financially material ESG topics and their associated metrics for the typical company in an industry.

With this information, investors like CalSTRS can more effectively engage companies on material

ESG issues and compare company disclosure and performance across sectors. Identifying what issues are material to a company's long-term sustainability is integral to effective and efficient corporate engagement. SASB standards enable businesses around the world to identify, manage and communicate financially material sustainability information to their investors.

The CalSTRS Sustainable Investment and Stewardship Strategies Unit regularly engages public companies and urges them to use SASB standards and metrics to report on financially related sustainability issues. SASB has provided CalSTRS staff education about the value of using the SASB Materiality Map and metrics in assessing potential investments and conducting due diligence. SASB's Materiality Map identifies sustainability issues that are likely to affect the financial condition or operating performance of companies within an industry.



Source: [sasb.org/standards-overview/materiality-map/](https://sasb.org/standards-overview/materiality-map/)

## TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

CalSTRS believes that climate change is one of the most significant long-term risks facing investors today. The climate risk management and disclosure guidance provided by the Task Force on Climate-Related Financial Disclosures provides investors with the ability to advocate for a single meaningful and material framework through which corporations can manage climate risks and provide climate-related disclosures. Through the consistency provided by the framework, investors like CalSTRS can properly evaluate the efforts and progress of the companies they invest in across regions, sectors or portfolios. In addition, as discussed in the introduction of this report, we have redesigned this report to align with the TCFD reporting guidance. This action supports the task force’s work and the need for consistency around climate-related disclosures.



# STRATEGY



*CalSTRS operates to serve our beneficiaries—more than 964,000 California public school educators and their families. Our objective is clearly laid out through our mission statement: Securing the financial future and sustaining the trust of California’s educators. Everything we do as an organization supports this mission. We must continuously reflect on and assess the risks and opportunities that might impact our portfolio today and over multiple decades in the future.*

*Although we are a long-term investor with significant passive public equity exposure, we are also very much active shareholders across our portfolio. Having ownership stakes in investments and companies gives us rights—to vote at company meetings, to speak up, to engage, and to advocate for changes we*

*believe are in the best long-term interest of the CalSTRS Investment Portfolio—and we take our responsibility seriously.*

*Climate change is a significant systemic risk to the global economy. All investments, all industries and all companies will be affected in the transition to a low-carbon economy. There is already overwhelming evidence that the world is experiencing the impacts of climate change daily. To provide insight into our climate-related strategy, this Strategy section provides a summary of our activities relating to the transition to a low-carbon economy and includes details on our specific stewardship and investment strategies as well as activities that align with California’s climate goals.*



## HOW CALSTRS IS PARTICIPATING IN THE TRANSITION TO A LOW-CARBON ECONOMY OVERVIEW

The latest report from the Intergovernmental Panel on Climate Change underscores the impact of human activities on greenhouse gas emissions and global warming. The consequences of climate change documented in the report include more extreme weather, rising sea levels and diminished Arctic Ocean ice. California's pattern of devastating droughts and fires brings the consequences closer to home for CalSTRS.

The IPCC report recommends limiting global temperatures to an increase of 1.5 degree Celsius above pre-industrial levels. Efforts to reduce emissions are already underway. The Paris Agreement, ratified by 184 nations in November 2016, mobilized world leaders in a global endeavor to transition to a low-carbon economy.

The links between climate change, business and investment are becoming increasingly evident. Climate change presents both:

- Physical risks—Risks that arise from the physical impacts of a changing climate.
- Transition risks—Risks that arise from the transition to a low-carbon economy, such as policy shifts and technological transformations.

Significant investment opportunities exist in helping the global economy both mitigate and adapt to a changing climate.

As a global institutional investor with a focus on the long term, we recognize that climate change presents a material and existential risk to society and the economy. We are committed to influencing public policies, engaging with the companies in our portfolio, and investing to promote an orderly transition to a low-carbon economy that benefits all.



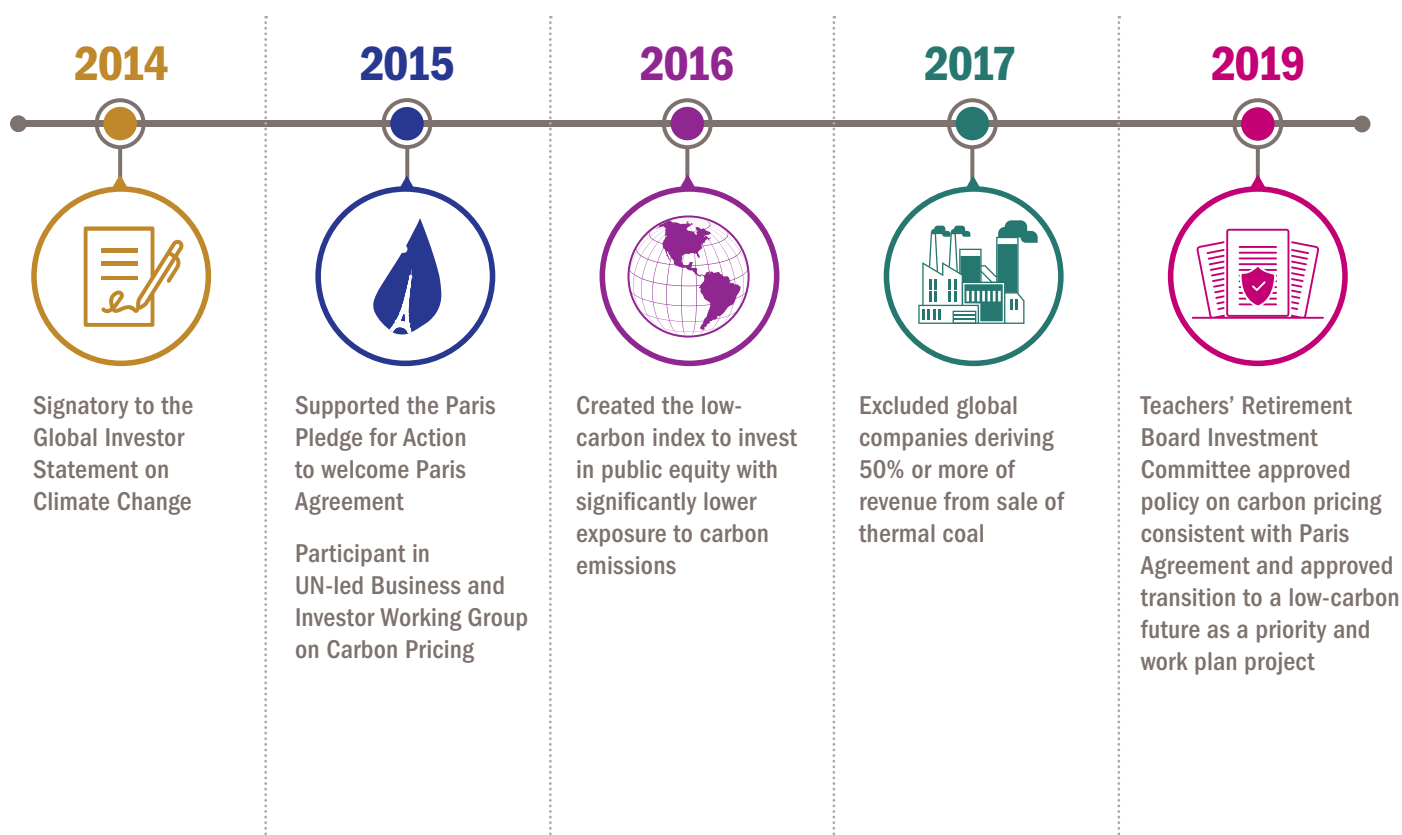
## TEACHERS' RETIREMENT BOARD INVESTMENT COMMITTEE APPROVES LOW-CARBON TRANSITION INVESTMENT POLICY

In May 2019, the Teachers' Retirement Board Investment Committee approved new policy language:

“CalSTRS believes that how the world responds to the risks associated with climate change, as detailed by peer-reviewed scientific reports, including those from the Intergovernmental Panel on Climate Change, will materially impact the value of our investment portfolio. We recognize that public policies, technological advances

and physical impacts associated with concerns about climate change are already driving the transition to a lower-carbon economy. As a diversified global investor, we need to understand the transition’s potential impacts and consider actions we can take to mitigate risk and identify related investment opportunities. How we engage companies and vote our proxies will also reflect our understanding of the low-carbon economic transition.”

### CALSTRS LOW-CARBON TRANSITION ACTIONS



## CALSTRS SUPPORTS CARBON PRICING

The Teachers' Retirement Board Investment Committee has approved policy language regarding our support for a stable and clear carbon-pricing framework that aligns with the Paris Agreement's goals of reducing global emissions. CalSTRS believes it is important for global policymakers to hear this message from one of the world's largest pension funds. We recognize that finding politically acceptable ways to price pollution will drive consumer behavior, business strategy and investment flow. We also recognize the imperative that the low-carbon transition avoids exacerbating economic inequality and related geopolitical risks.

## STEWARDSHIP HIGHLIGHTS

### Playing a Leadership Role in the Climate Action 100+

CalSTRS works with more than 370 global investors who collectively represent \$35 trillion in assets under management to engage over 100 of the world's most significant greenhouse gas emitters to align their goals with the Paris Agreement. As a result of the Climate Action 100+ coalition, to date:



Duke Energy, one of the largest U.S. utility companies, plans a 50 percent reduction in carbon emissions by 2030 and net zero emissions by 2050.



American Electric Power, one of the largest U.S. utility companies, set a goal to reduce carbon emissions by 70 percent by 2030 and 80 percent by 2050.

## GLENCORE

Glencore, the world's largest mining company, agreed to cap global coal production and reduce global emissions.



Maersk, the world's largest ocean shipping company, committed to net zero carbon emissions by 2050.



Shell, with operations in 70 countries and territories worldwide, committed to reduce emissions across its entire value chain.

## Participating in the Task Force on Climate-Related Financial Disclosures

CalSTRS is engaging companies to adopt the recommendations of the TCFD to increase the availability of consistent climate-related financial risk disclosures. Better information helps investors price climate risk and reward climate innovation. There is significant positive momentum around the world with a growing number of companies reporting in alignment with the TCFD.

## Low-Carbon Investment Highlights

- **Creating the CalSTRS Low-Carbon Index:**  
We have invested more than \$2.6 billion in a public equity low-carbon index that is projected to have approximately 70 percent lower exposure to carbon emissions than a non-low-carbon index.
- Investing in multiple sustainability-focused strategies across the portfolio, as detailed in the Strategy section of this report.
- Excluding global companies deriving 50 percent or more of their revenues from the sale of thermal coal.

## NEXT STEPS

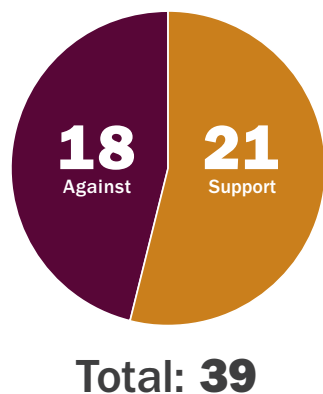
The Teachers' Retirement Board has determined that the low-carbon transition is an urgent priority and has approved a work plan project that focuses on:

- Building consensus among the board and staff about how the low-carbon transition will impact CalSTRS and our portfolio.
- Analyzing the transition readiness of our portfolio to deepen our understanding of both physical climate-related issues and transition issues across different asset classes, geographies and strategies.
- Expanding our stewardship activities through public policy engagement, corporate engagement and proxy voting to support an orderly transition aligned with the Paris Agreement and the findings of the Intergovernmental Panel on Climate Change. This recognizes our considerable influence as a large investor to impact public policy and corporate action.
- Continuing our commitment to reporting and communicating with our partners, peers, stakeholders and legislators.

## STEWARDSHIP ACTIVITIES: PROXY VOTING

Voting corporate proxies is a fiduciary responsibility and an important way to manage the risks associated with public equity ownership. The Teachers' Retirement Board has delegated the responsibility for voting CalSTRS proxies to Investments staff. Staff uses the CalSTRS Corporate Governance Principles as guidelines to assist in making proxy vote decisions. Appendix A to the principles is the Statement of Shareowner ESG Responsibility, which provides direction in determining how ESG-related proposals should be considered. The board regularly reviews, revises and approves these principles.

Staff considers dozens of environmental-related shareholder proposals that cover a variety of issues and ask for varying levels of action. Some environmental proposal issues are greenhouse gas emissions, energy efficiency, waste disposal and recycling. These proposals request actions such as preparing reports, establishing emissions targets and setting waste reduction goals. During the 2018–19 fiscal year, staff considered 39 environmental proposals, supporting 21 of them and voting against 18. The table below provides a breakdown of the issues considered.



### Environmental Proposals, July 1, 2018–June 30, 2019

| Issue Description  | Votes FOR  | Votes AGAINST | TOTAL       |
|--|------------|---------------|-------------|
| Adoption of Comprehensive Recycling Strategies           | 1          | 2             | 3           |
| Environmental Report                                     | 4          | 7             | 11          |
| Formation of Environmental/Social Committee of the Board | 1          | 6             | 7           |
| Miscellaneous Energy/Environmental Issues                | 1          | 0             | 1           |
| Report on Environmental Performance                      | 2          | 0             | 2           |
| Report/Action on Climate Change                          | 5          | 0             | 5           |
| Review Energy Efficiency and Renewables                  | 1          | 0             | 1           |
| Sustainability or Environmental Reports                  | 4          | 2             | 6           |
| Sustainability Report                                    | 2          | 1             | 3           |
| <b>Total</b>   | <b>21</b>  | <b>18</b>     | <b>39</b>   |
| <b>Percentage</b>  | <b>54%</b> | <b>46%</b>    | <b>100%</b> |

In the CalSTRS environmental proposal analysis, 10 shareholder proposals related to the phaseout of nuclear power were not included in the total. While nuclear power is a polarizing topic, for the purpose of this analysis, it is considered a power generation source that contributes to a reduction in emissions and, therefore, the transition to a low-carbon economy. Additionally, we did not include 16 other proposals because they had miscellaneous topics that did not appropriately fit into these topics.

CalSTRS reviewed each of these 39 proposals and assessed whether the proposal would add value to the investment if it passed and was not overly prescriptive in its request. Traditionally, we support proposals that call for improved environmental risk reporting, unless we believe the company already adequately discloses these risks. In general, we do not support environmental proposals intended to substitute for management's operational judgments. We believe companies should manage environmental risk and decide how to design and implement risk management systems. We supported 17 of the 27 proposals that called on companies to produce an environmental, climate change or sustainability report.

Two examples of climate-related shareholder proposals that we voted in favor of were at BP and Chevron.



The proposal requested that BP provide, in its future strategic reporting, a description of how its strategy aligns with the goals of the Paris Agreement, including details on new capital expenditure, metrics and targets.



The proposal requested that Chevron issue a report on how it can reduce its carbon footprint in alignment with greenhouse gas reductions necessary to achieve the Paris Agreement's goal of maintaining global warming well below 2 degrees Celsius.

We provide transparency in how we vote at individual companies' annual general meetings on our [proxy vote disclosure website](#).

## CALSTRS CLIMATE-RELATED SHAREHOLDER PROPOSALS

When CalSTRS Investments staff believes a company is not willing to make the necessary progress toward managing environmental risks, we will strongly consider exercising our equity ownership rights by filing a shareholder proposal with the company calling for the company to improve its environmental risk management efforts. The intent of the shareholder proposal is to bring our concerns to the company's shareholders and generate enough support from the investor base to convince the company to commit to our recommendations. Often, the filing of a shareholder proposal will increase a company's willingness to engage further with staff and lead to a commitment to improve risk-management and disclosure.

Since 2008, we have filed 53 climate-related shareholder proposals that called on companies to improve their environmental risk-management disclosure efforts. Of these 53 shareholder proposals, 40 were ultimately withdrawn before the company's annual meeting because staff was able to negotiate a mutually agreeable outcome. Since 2008, the 11 proposals voted on by shareholders have received, on average, 28 percent support.

*Since 2008, CalSTRS has filed 53 climate-related shareholder proposals that called on companies to improve their environmental risk-management disclosure efforts.*



Shareholder proposals that we have filed in recent years:



### Energy Efficiency Management

Shareholders request the board of directors issue an energy efficiency report describing the company's short- and long-term strategies on energy use management. The requested report should include a company-wide review of the policies, practices and metrics related to energy management strategy. The report should be prepared at reasonable cost, omit proprietary information and be made available to shareholders.



### Water Use Management

Shareholders request that a sustainability report be issued that describes the company's policies, performance, and improvement targets related to key environmental, social and governance risks and opportunities, including an analysis of material water-related risks. The report should be prepared at reasonable cost and omit proprietary information.



### Methane Emissions Reduction

Shareholders request a report at reasonable cost, omitting proprietary information, that reviews the company's policies, actions and plans related to methane emissions management, including efforts to measure, monitor, mitigate, disclose, use leak detection and repair technologies (including frequency, scope and methodology), and set quantitative reduction targets for methane emissions resulting from aggregate operations under the company's financial or operational control.

## CALSTRS LED METHANE EMISSIONS SHAREHOLDER PROPOSALS AT OIL AND GAS AND GAS UTILITY COMPANIES

Methane, the primary component of natural gas, is a climate pollutant 84 times more powerful than carbon dioxide, according to the Environmental Defense Fund. Their calculations show methane is responsible for a quarter of the warming the Earth is experiencing today. Unmanaged methane emissions could undermine the value proposition of natural gas for delivering cleaner, low-cost energy through increasing scrutiny from the public, environmental and health groups, and state and federal policymakers.

CalSTRS continues to engage oil and gas and gas utility companies on how they approach the issue of fugitive methane emissions. The focus of this ongoing engagement is to determine how companies consider the risk associated with methane emissions, to what degree they already capture fugitive methane emissions, and whether they have analyzed the business case associated with improving methane capture.

Since 2015, we have filed 10 methane emissions reduction related shareholder proposals with oil and gas and gas utility companies. More than half of these proposals were withdrawn after staff successfully negotiated a mutually agreeable outcome with the company. Some of these agreed upon outcomes were based on companies taking actions that aligned both to reducing emissions and providing a better return for investors.



## STEWARDSHIP ACTIVITIES: CORPORATE ENGAGEMENT

CalSTRS is a long-term active owner. It is our responsibility to be a steward of capital, to assess companies in our portfolio and to determine ways to unlock value and mitigate risk.

As an active shareholder, we seek to use the tools we have access to in order to drive change and enhance the value of the CalSTRS Investment Portfolio over the long term. We engage hundreds of companies per year. Through these engagements, staff has direct access to corporate boards and management. Corporate engagement allows us to use our voice as a \$240 billion asset owner and open a dialogue with companies. We have demonstrated that, over time, engagement can effectively drive change that has a positive impact on our fund, the companies we engage, society and the environment.

The low-carbon transition is an engagement priority for CalSTRS that incorporates engaging companies on their governance structures, business strategies and disclosures that demonstrate their resilience to changing public policies, technological advancements and physical impacts associated with concerns about climate change.

Staff regularly engages the most carbon-intensive companies individually and through collaborations with like-minded investors. The benefits of collaboration are significant and include the ability to leverage the strength of our portfolio while giving a larger voice to issues and engagements we are involved with. This section highlights examples of individual and collaborative engagements that we have led and participated in.

The low-carbon transition is an engagement priority for CalSTRS.

## Task Force on Climate-Related Financial Disclosures



In 2015, the Financial Stability Board established the Task Force on Climate-Related Financial Disclosures to develop voluntary, consistent climate-related financial risk disclosures that companies could use to provide information to investors, lenders, insurers and other stakeholders.

The task force considered the physical, liability and transition risks associated with climate change and what constitutes effective financial disclosures across industries in order to help companies understand what financial markets want from them regarding how they measure and manage climate change risks.

On June 29, 2017, the task force released its final report that provides the context, background and framework for climate-related financial disclosures. The following graphic summarizes the disclosures highlighted in the report.

| Governance   | Strategy  | Risk Management   | Metrics and Targets   |
|--|---|---|---|
| Disclose the organization's governance around climate-related risks and opportunities.           | Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material. | Disclose how the organization identifies, assesses and manages climate-related risks.   | Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.           |
| <b>Recommended Disclosures</b>   | <b>Recommended Disclosures</b>  | <b>Recommended Disclosures</b>  | <b>Recommended Disclosures</b>  |
| a) Describe the board's oversight of climate-related risks and opportunities.                    | a) Describe the climate-related risks and opportunities the organization has identified over the short, medium and long term.   | a) Describe the organization's processes for identifying and assessing climate-related risks.   | a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process. |
| b) Describe management's role in assessing and managing climate-related risks and opportunities. | b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy and financial planning.  | b) Describe the organization's processes for managing climate-related risks.  | b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas emissions, and the related risk.  |
|  | c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.                                | c) Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organization's overall risk management. | c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.                       |

Source: TCFD-Recommendations-Overview June 2017

CalSTRS formally supported the recommendations of the TCFD when they were launched and began engaging companies on TCFD guidance. Staff continues to engage companies to raise awareness about the TCFD and promote TCFD-aligned climate change risk management actions and disclosure.

Our engagements have helped drive adoption of the TCFD's recommendations. As of September 2019, nearly 900 organizations have committed to support TCFD recommendations. Additionally, as of October 2019, nearly 200 Japanese companies have committed to support TCFD recommendations, including four Japanese companies for which CalSTRS is the lead investor as part of the Climate Action 100+ engagement.

## Climate Action 100+

CalSTRS plays a leadership role in Climate Action 100+, a collaborative engagement effort of more than 370 global investors, representing \$35 trillion in assets under management, focused on the largest global emitters of carbon dioxide. The 5-year effort centers around actions the companies are taking, or plan to take, to manage and mitigate climate change risk. Investors call on companies to improve governance on climate-related risks, curb emissions and strengthen climate-related financial disclosures.



### CLIMATE ACTION 100+ AT A GLANCE

373 investor signatories, representing over



in assets under management

Up to



of global industrial emissions accounted for by the companies targeted by Climate Action 100+

Growth in investor signatories since launch



Global investors across



engaged across



### GOALS OF CLIMATE ACTION 100+

Investors participating in Climate Action 100+ recognize that

#### DECARBONIZATION

of the global economy is complex and will require unique strategies and approaches across businesses and sectors. Signatories have agreed on a common engagement agenda that seeks

#### COMMITMENTS

from boards and senior management to:

#### 1. GOVERNANCE

Improve climate-related governance



#### 2. ACTION

Curb emissions



#### 3. DISCLOSURES

Strengthen climate-related disclosures



## The Collective Engagement From 370 Global Investors, Including CalSTRS, Has Led to These Industry Leading Public Commitments:

**Royal Dutch Shell**, one of the world's oil and gas supermajors, released a joint statement committing to a range of industry leading climate commitments, including emissions reduction targets that include scope 3 emissions.

**Glencore**, the world's largest exporter of thermal coal, agreed to cap coal production to current levels of about 145 million tonnes per year.

**Xcel Energy**, a major US electric utility, has set out an intention to reach zero carbon electricity by 2050.

**Maersk**, the world's biggest shipping company, committed to net zero emissions by 2050.

**Rio Tinto** has exited from mining coal, published a TCFD report, and committed to an asset by asset review to set emissions reduction targets.

**Nestlé** committed to net zero emissions by 2050, including scope 3 emissions.

**PTT Public Company Limited** (Thailand) has released a TCFD aligned report, indicating the company's intention to align its strategy with the goals of the Paris Agreement.

**Volkswagen** committed to become 'climate neutral' by 2050 and launch nearly 70 electric vehicle models by 2028.

**AES Corporation** has conducted scenario analysis against three transition pathways, and committed to a 70% reduction in carbon intensity by 2030.

**Duke Energy Corporation** announced an update to its carbon transition plan, with a 50% reduction in GHG emissions by 2030 and net zero emissions generation by 2050.

**PetroChina** developed a climate change strategy and signalled the company's intention to align its climate policy to the goals of the Paris Agreement.

**HeidelbergCement** committed to achieve net zero emissions by 2050.

Source: [climateaction100.files.wordpress.com/2019/10/progressreport2019.pdf](https://climateaction100.files.wordpress.com/2019/10/progressreport2019.pdf)

### CalSTRS Signs Vatican Climate Action Statement

#### Chair of Investment Committee participates in the Pope's dialogue on energy transition

In June 2019, CalSTRS, along with leading global investors and oil and gas industry executives, announced a collective commitment to accelerate action to avoid the worst consequences of climate change. After two days of dialogue hosted by the Vatican and the University of Notre Dame, the attendees issued two joint statements calling for meaningful carbon pricing and enhanced climate-related disclosure. The gathering was called The Energy Transition and Care for Our Common Home.

Pope Francis met with executives, including the Teachers' Retirement Board's Investment Committee Chair Harry M. Keiley, to underscore the urgent need for "a radical energy transition" that will address the challenges of climate change and protect the world's most vulnerable populations and future generations.

"The Teachers' Retirement Board recognizes that climate change poses existential and financial risks, and we are committed to addressing them."

—Harry M. Keiley, chair of the Teachers' Retirement Board Investment Committee

## Duke Energy Case Study: A CalSTRS-Led Climate Action 100+ Engagement Success



Duke Energy is one of the companies CalSTRS is leading engagements with through Climate Action 100+. In September 2019, Duke Energy announced an updated climate strategy that would reduce its carbon emissions by half or more from 2005 levels by 2030 and attain net-zero carbon emissions by 2050. Since 2005, the company has already cut emissions by 31 percent.

### Why Is CalSTRS Engaging Duke Energy?

CalSTRS conducted an assessment to determine the largest greenhouse gas emitters in our Public Equity and Fixed Income portfolios. When Climate Action 100+ was being developed, we requested the opportunity to be the lead investor for the Duke Energy engagement as Duke Energy is one of the largest emitters in both of these portfolios.

Significant emissions reduction commitments from the most carbon-intense companies will make a material difference to the carbon exposure of the CalSTRS Investments Portfolio and will further assist in the transition to a low-carbon economy.

### What Impact Can Engagements Create?

To convey the magnitude of Duke Energy’s commitment to attain net-zero carbon dioxide emissions by 2050, Duke Energy converted the emissions reduction into the number of passenger vehicles driven for one year. Duke Energy used the Environmental Protection Agency’s Greenhouse Gas Equivalencies Calculator to determine that reducing its carbon dioxide emissions to zero from its 2005 baseline of 153 million tons would be the equivalent of taking more than 29 million vehicles off the road.

### Duke Energy’s Commitment








#### DUKE ENERGY’S CARBON DIOXIDE REDUCTION GOALS

- BY 2030** Cut CO<sub>2</sub> Emissions by at Least 50 Percent
- BY 2050** Attain Net-Zero CO<sub>2</sub> Emissions

### Duke Energy’s Path to a Low-Carbon Future

- Collaborate and align with the stakeholders and states in which they operate as they transform.
- Accelerate their transition to cleaner energy solutions.
- Continue to operate their existing carbon-free technologies.
- Modernize their electric grid.
- Advocate for sound public policy that advances technology and innovation.

## Passenger Vehicle Equivalent of Duke Energy's Goals

| TARGET YEAR  | 2018  | 2030   | 2050  |
|--|---|--|---|
| Duke Energy CO <sub>2</sub> Reductions**   | 31%   | 50%  | 100%  |
| Passenger Vehicle CO <sub>2</sub> Equivalence***   | More than 9 million vehicles  | More than 14 million vehicles  | More than 29 million vehicles   |
|  = 1,000,000 passenger vehicles |  |  |  |
| Equivalent to taking all the cars off the road in:   |  |   |  |

\*\* Calculated from a 2005 baseline of 153 million tons  
 \*\*\* Source: EPA Greenhouse Gas Equivalencies

Source: [duke-energy.com/\\_/media/pdfs/our-company/191792/carbon-reduction-factsheet.pdf](http://duke-energy.com/_/media/pdfs/our-company/191792/carbon-reduction-factsheet.pdf)

To create an estimate of the reduction impact our ownership stake in Duke Energy might create, based on the percentage of our ownership, we used the EPA's Greenhouse Gas Equivalencies calculator to determine:



**GREENHOUSE GAS EMISSIONS REDUCTION FROM 58,938** passenger vehicles driven for 1 year



**CO<sub>2</sub> EMISSIONS REDUCTION FROM 31,236,471** gallons of gasoline consumed  
**48,409** household electricity use for 1 year



**GREENHOUSE GAS EMISSIONS AVOIDED BY 12,112,157** trash bags of waste recycled instead of landfilled



**CARBON SEQUESTERED BY 4,590,150** tree seedlings grown for 10 years  
**326,712** acres of U.S. forests in 1 year

## Eco-Efficiency Initiative

CalSTRS participates in an engagement related to eco-efficiency led by fellow investor Boston Common.

This engagement was developed through the understanding that 50 percent or more of greenhouse gas emissions reductions can come from energy efficiency and that energy efficiency can reduce a company's operating expenses while helping to decrease climate risk exposure. More efficient companies can improve their sustainability profiles while also improving financial returns for investors. This engagement combines water efficiency and waste elimination with energy efficiency to help companies take a multidimensional approach to retooling their products, processes and policies in order to achieve sustainable profitable growth. This can be accomplished by creating desirable products produced in efficient ways that improve margins and support low natural resource use. In the end, these efforts create a win-win situation for investors, society and the environment.

In 2019, the Eco-Efficiency Initiative published its first progress report, *Improving Efficiency, Unlocking Returns*. More than 25 companies across energy-intensive industries were engaged to assess and identify where they could save energy and water, and eliminate waste.

This multiyear engagement began in 2016 and has continued to gain traction. CalSTRS and more than 60 global institutional investors, with more than \$1 trillion in assets under management, have participated in the engagement meetings or co-signed letters to one or more companies.

## Eco-Efficiency Commitments and Best Practices



Air Liquide committed to adopt new energy efficiency goals and to undertake a global water risk and use assessment.



Since 2006, BMW has achieved a 36 percent per vehicle reduction in energy consumption and is on track to double its energy productivity by 2025. One BMW plant site in San Luis Potosi, Mexico, uses 100 percent renewable energy and recycles all wastewater. The company now invests in electric vehicles and toward making cars lighter with carbon fiber in order to increase gas mileage.



National Grid reports that by 2020 it will include carbon pricing targets for all projects, reduce embedded carbon emissions in construction projects by 50 percent and increase the energy efficiency of its property portfolio by 10 percent.



Origin Energy revamped its capital allocation processes to align with its long-term sustainability goals. As a result, Origin decided to avoid investing in additional coal-fired power plants on the market in Australia, diverting millions of dollars away from coal.



Taiwan Semiconductor Manufacturing Company reported public energy productivity, water use and waste targets to reduce water power usage to 12 percent, water usage by 30 percent and outsourced unit waste output by 2020. Further, by 2025, TSMC commits to work with raw material suppliers to convert waste into electronic-grade chemicals.

## Ceres Investor Network

on Climate Risk and Sustainability

*The Ceres Investor Network includes over 170 institutional investors, managing more than \$26 trillion in assets, advancing leading investment practices, corporate engagement strategies, and key policy and regulatory solutions. As a member of the CERES Investor Network, CalSTRS collaborates with our institutional investor peers to share updates on key research and best practices, develop strategies, and advance climate-related engagements and initiatives.*

CalSTRS is a member of several CERES Investor Network working groups including:

### **Carbon Asset Risk Working Group**

The Carbon Asset Risk Working Group works with investors to develop strategies and tactics for engaging with oil and gas and electric power companies as they transition to a low-carbon economy.

### **Investor Water Hub**

The Investor Water Hub works with investors to evaluate and manage water risks in investment practices and decision making.

### **Shareholder Initiative on Climate and Sustainability**

The Shareholder Initiative on Climate and Sustainability works with investors seeking to engage on filing shareholder proposals and corporate engagements on key climate, energy and sustainability issues.

### **Policy Working Group**

The Policy Working Group works with investors to engage federal and state policymakers on key climate, clean energy and water policies.



# WATER RISK

For the past five years, CalSTRS has been a member of the Ceres Investor Water Hub, which works to help drive greater consideration of water risk in investment decision making. In 2015, Ceres developed the *Feeding Ourselves Thirsty: How the Food Sector Is Managing Global Water Risks* report, which evaluated publicly available information on the water use, stewardship and policies of 37 major food sector companies. CalSTRS was a signatory to a letter directed to many of these companies that asked for better water risk-related disclosure from their direct operations and supply chains. From this involvement, many of the companies opted to enhance their water-related disclosure during 2016.

In a fall 2017 refresh of the Ceres' 2015 *Feeding Ourselves Thirsty* analysis, Ceres ranked more than 40 of the largest food sector companies on how they responded to water risks and how performance has changed since the first round of benchmarking. CalSTRS has met with several of these beverage, agricultural products, meat, and packaged food companies during recent years to understand their water risk management strategies, including how climate change is affecting water sourcing and their supply chains.

Using the report's metrics, CalSTRS identified an additional poultry farming company that could make improvements to its water risk management disclosure. We began engaging the company in late 2017 and have collaborated with other investors during 2019 to elevate the engagement. In November 2019, Ceres released an updated third edition of *Feeding Ourselves Thirsty*, which will be a valuable tool as staff continues to engage companies on water risk management.

## PRI Methane Engagement Group



*In 2017, CalSTRS joined the PRI Methane Engagement Group, which consists of 36 investors from 11 countries representing \$4.2 trillion in assets under management. This engagement encourages energy and utility companies to improve their management and disclosure of methane emissions. It targets 31 companies across all segments of the natural gas value chain from upstream production to downstream utilities.*

The PRI Methane Engagement initiative's objectives are to:

- Strengthen investor understanding on methane risk exposure in global portfolios.
- Understand best practices in managing methane risks.
- Transfer these learnings across companies to encourage energy and utility companies to improve their management and reduction of methane emissions, and to strengthen disclosure of their progress.

The engagement began with PRI and the 36 participating investors conducting assessments of each of the 31 companies' methane-related disclosure. Over the course of the 2-year engagement, investors urged companies to improve their disclosure on methane leak rates and their leak detection and repair activities. Investors also engaged companies to take action and commit to setting methane emissions reduction targets. The engagement has proven successful as many companies have shown improvements in their methane-related disclosure and through setting emissions reduction targets.

The official PRI methane engagement outcomes are expected to be released in early 2020. Our work with PRI complements the individual work that we have done on engaging more than 40 oil and gas and gas utility companies on methane-related risks.

## STEWARDSHIP ACTIVITIES: PUBLIC POLICY ENGAGEMENT

Investors play an important role in providing input for governments to create effective climate policies, and we are committed to influencing public policies that promote an orderly transition to a low-carbon economy.

CalSTRS works to identify the risks and opportunities that arise from climate change policies as well as the impact these may have on our portfolio. In certain cases, climate-related public policy can act as a catalyst to help advance the transition to a low-carbon economy. In others, policy can be developed that acts as a road block to progress and may allow companies to increase emissions or make certain renewable investments that are not as beneficial for investors and companies.

In order to enhance the influence that CalSTRS has on public policy, we collaborate and work with other investors and coalitions. Some of the most recent public policy engagement efforts that we have participated in follow.

### CalSTRS calls on governments to act

Ahead of the 2019 United Nations Climate Action Summit, CalSTRS was one of 515 institutions, managing \$35 trillion in assets, that delivered the Global Investor Statement to Governments on Climate Change. The statement calls on governments to phase out thermal coal power worldwide, put a meaningful price on carbon pollution, end government subsidies for fossil fuels, and update and strengthen nationally determined contributions to meet the emissions reduction goal of the Paris Agreement no later than 2020. The U.N. Secretary General mentioned the importance of hearing investor voices in his comments to the General Assembly.



### CalSTRS urges companies to ensure consistent corporate and trade association lobbying

CalSTRS believes companies play an important role in providing input for governments to create effective climate policies. We, along with 200 investors representing \$6.5 trillion in assets, are calling on 47 of the largest U.S. publicly traded corporations to align their climate lobbying with the goals of the Paris Agreement, warning that lobbying activities that are not consistent with meeting climate goals are an investment risk.

Specifically, investors are asking companies to:

- Ensure their own lobbying practices and those of trade associations in which they are members align with the 2015 Investor Expectations on Corporate Climate Lobbying document.
- Review the lobbying positions taken by any organization of which a company is a member.
- Engage with organizations if their lobbying positions are inconsistent with the goals of the Paris Agreement and ensure its positions are updated.
- Ask an organization that is unwilling or unable to demonstrate alignment with the Paris Agreement to consider taking steps necessary to disassociate from these positions.

## INVESTMENT ACTIVITIES BY ASSET CLASS

The CalSTRS Green Team, which consists of Investment staff from all CalSTRS asset classes, continues to work together to refine and enhance our understanding of environmental risk. The Green Team has identified 11 methods staff uses to incorporate environmental risk factors and climate-related considerations into investment risk management and ongoing due diligence efforts. These methods, including a short description and icon for each, are listed on the next page.

In each asset class profile in this report, we include the methods and icons that each asset class team uses to integrate environmental risk factors and climate-related considerations into the investment management process.

Each asset class profile features the total number of staff in the team, the assets under management, and the asset class's investment focus areas. The profiles also highlight the long-term performance of the asset class and additional information related to our sustainability-focused investments.





**ESG Risk Factor Investment Management Agreement**—When any manager, internal or external, makes an investment decision on behalf of CalSTRS, the manager must consider the CalSTRS ESG risk factors. The risk factors are also part of the continuous due diligence process staff undertakes with existing investments and investment managers. Staff regularly queries external fund managers about how they consider these risk factors, particularly climate risk, when making investment decisions on our behalf.



**Commodity Risk Analysis**—Commodity risk analysis refers to the assessment of future market values and investment return caused by the fluctuation in the prices of commodities. These commodities may be grains, metals, gas or electricity, and may be used extensively during operations.



**Credit Rating Analysis**—Many leading credit rating agencies have committed to including the use of ESG factors in a more systematic way when assessing the creditworthiness of a company participating in the debt capital markets.



**Dedicated Sustainability Investment Strategy**—Even though environmental risks are incorporated throughout the CalSTRS Investments Portfolio, certain asset classes have more specifically defined sustainability investment strategies than others.



**Engineering Technical Assessment**—Engineering technical assessment evaluates the design, construction, maintenance and ongoing use of the physical and naturally built environment. For a business or building, this can impact energy and water usage, building air quality, and even work productivity.



**Environmental Impact Assessment**—Environmental impact assessment is a process of evaluating the likely climate-related environmental impacts of a proposed project or development. The assessment may also propose measures to avoid, mitigate or offset environmental risks.



**ESG Score Analysis**—ESG scores help investors identify environmental, social and governance risks and opportunities within their portfolio. Staff conducts research on CalSTRS' exposure to industry-specific ESG risks, especially climate risks, and a portfolio company's ability to manage those risks relative to peers.



**Investment Advisory Boards**—An advisory board is a body that provides strategic advice to the management of a corporation, organization or partnership. Staff or representatives participate as members of many investment advisory boards.



**LEED & Energy Star Certifications**—LEED and Energy Star certifications are two of the most widely used frameworks to assess and benchmark a building's energy efficiency and environmental sustainability. More efficient use of energy is a strong climate risk mitigation.



**Proxy Voting**—Proxy voting is the primary means by which shareholders can influence a company's operations, its corporate governance, and even its social and environmental responsibility activities. Voting corporate proxies is a fiduciary responsibility and an important way to manage the risks associated with public equity ownership. Over the course of any fiscal year, staff considers dozens of environmental-related shareholder proposals covering a variety of issues, including climate change.



**Public Company Engagement**—Staff often engages a portfolio company that is not willing to make the necessary progress toward managing material environmental risks, such as climate risks, by developing a dialogue to better understand and motivate the company to mitigate such risks. This would also include collaboration with many other asset managers and organizations.

## SUSTAINABLE INVESTMENT AND STEWARDSHIP STRATEGIES

Total staff

**16**

Total AUM

**\$5.4  
BILLION**

as of June 30, 2019

### Environmental Integration



ESG Risk Factor Investment Management Agreement



Dedicated Sustainability Investment Strategy



Proxy Voting



ESG Score Analysis



Public Company Engagement



The Sustainable Investment and Stewardship Strategies Unit was established as the Corporate Governance Program in 1978. In 2019, it was renamed to reflect the expanded scope of CalSTRS' ESG activities.

### SISS ACTIVIST PORTFOLIO

Activist funds are concentrated portfolios in which managers acquire large individual positions and engage boards and management to undertake value-driving change. SISS activist managers actively leverage their ownership stakes to intervene and influence a company's long-term strategy, sustainability profile, environmental impact, capital structure, capital allocation plan, executive compensation practices and corporate governance profile.

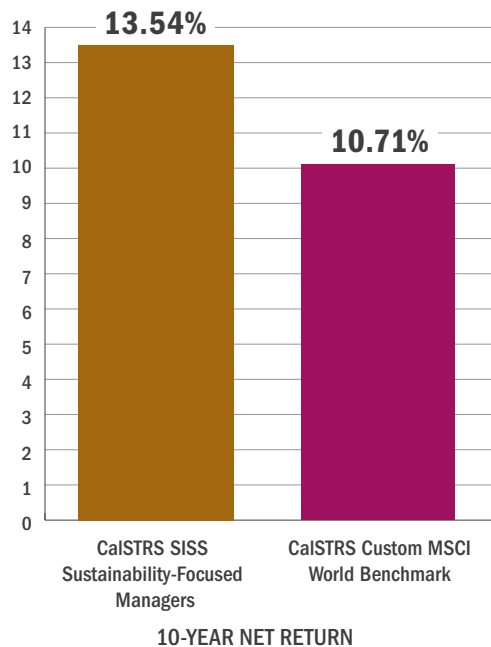
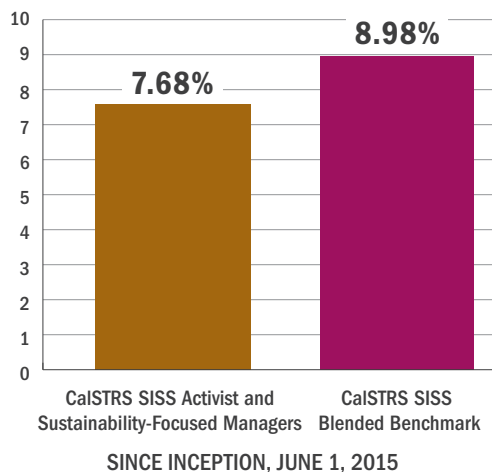
### SISS SUSTAINABILITY-FOCUSED PORTFOLIO

Sustainability-focused funds incorporate robust consideration of ESG issues throughout their investment processes. The managers recognize that ESG factors can impact company valuations and that risks and opportunities associated with ESG factors impacting strategy need to be evaluated alongside more traditional financial considerations. The sustainability-focused portfolio seeks to generate competitive returns and outperform broad market indexes while demonstrating a positive impact on the environment and society.

The chart below and to the left includes the aggregate performance of the SISS activist and sustainability-focused portfolios. The chart below and to the right exclusively features the performance of the SISS sustainability-focused portfolio.

### Sustainable Investment Performance

as of June 30, 2019



### CalSTRS Announces Sustainability-Focused Public Equity Managers

In June 2019, CalSTRS announced the funding of three new public equity investment managers. This was the culmination of a thorough and rigorous selection process that allowed us to identify proven industry leaders with expertise in integrating ESG analysis into investment decision making. We believe they will bring positive environmental, social and financial impacts to our portfolio.

The firms will collectively manage \$750 million across sustainability-focused strategies. The three firms—Hermes Investment Management, Impax Asset Management and Schrodgers—are highly attuned to how sustainability-related trends, like the low-carbon transition and resource efficiency, create investment risks and opportunities. These firms offer geographic diversification and apply analytical rigor in incorporating environmental, social and governance factors into fundamental analysis, all while maintaining a long-term investment horizon.

## FIXED INCOME

Total staff

**23**

Total AUM

**\$29.2  
BILLION**

as of June 30, 2019

### Environmental Integration

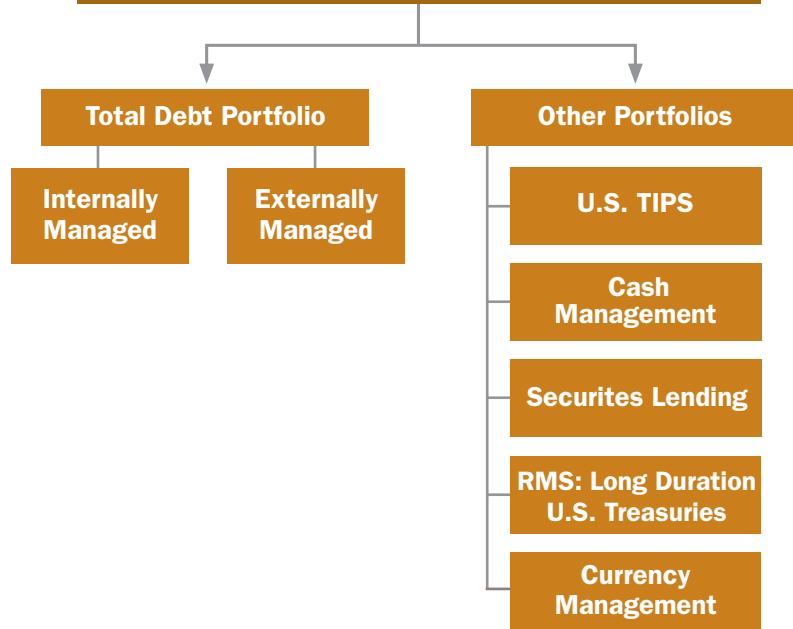


ESG Risk Factor  
Investment Management  
Agreement



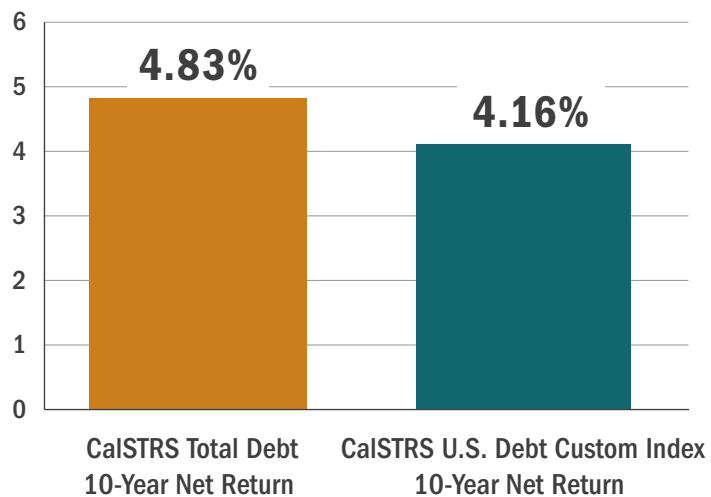
Credit Rating Analysis

### CalSTRS Fixed Income Assets Under Management



The goal of the Fixed Income asset class is to improve the diversification of CalSTRS' total investment portfolio, enhance risk-adjusted total return, preserve capital and liquidity, and generate current income while facilitating the fund's cash needs.

### Asset Class Performance





## Green Bond Memberships

CalSTRS' Fixed Income continues to provide guidance to members of climate-related groups, including the Climate Bonds Initiative and the International Capital Market Association's Green Bond Principles.



CalSTRS is on the Climate Bonds Standards Board of the Climate Bonds Initiative, a multidisciplinary and multimember nonprofit organization that seeks to establish standards along with a certification schedule for issuers and underwriters interested in issuing green bonds. A number of technical and working groups are attempting to establish rigorous standards in areas ranging from solar energy to biofuels. Fixed Income continues to work closely with our Sustainable Investment and Stewardship Strategies Unit on this initiative.



In January 2014, the Green Bond Principles were developed through guidance from issuers, investors and underwriters, and serve as voluntary guidelines on the recommended process for the development and issuance of green bonds. The 2018 edition of the Green Bond Principles was released in June 2018 after a consultation period with members and observers active in the green bond market. CalSTRS Fixed Income staff is a member of the Green Bond Principles and previously served as an executive committee member.

Fixed Income will continue to expand our leadership role in the green bond market and work with peers, underwriters and issuers to better define the green bond space. Fixed Income staff will also serve as a resource to others looking to enter the field as an investor or issuer.

## Why Invest in Green Bonds?

Green bonds offer competitive returns that complement our Fixed Income Portfolio, with the added benefit of investing in projects that benefit the environment. The table below highlights the largest CalSTRS green bond holdings.

| CalSTRS Green Bond Holdings: \$286 million (as of June 30, 2019) |                  |                  |   |
|--|------------------|------------------|---|
| Issuer   | Years Issued     | % of Green Bonds | Use of Proceeds                                       |
| African Development Bank   | 2018             | <b>13.96%</b>    | Climate mitigation and adaption                       |
| KfW  | 2016, 2017, 2018 | <b>6.98%</b>     | Renewable energy projects                             |
| Apple Inc.   | 2016, 2017       | <b>5.93%</b>     | Environmentally sustainable projects                  |
| European Investment Bank   | 2016, 2017, 2018 | <b>4.19%</b>     | Renewable energy and energy efficiency                |
| MidAmerican Energy   | 2017, 2018, 2019 | <b>4.19%</b>     | Renewable energy                                      |
| Southern Power Company   | 2015, 2016       | <b>4.19%</b>     | Renewable energy generation                           |
| Bank of America Corp.  | 2016, 2018       | <b>3.49%</b>     | Renewable and energy efficiency projects              |
| Export-Import Bank of Korea                                      | 2016             | <b>3.49%</b>     | Renewable energy projects                             |
| Swedish Export Credit  | 2015             | <b>3.49%</b>     | Transition to low-carbon and climate resilient growth |
| Neder Waterschapsbank  | 2016, 2017, 2018 | <b>3.14%</b>     | Climate mitigation and adaptation, biodiversity       |

## GLOBAL EQUITY

Total staff

**18**

Total AUM

**\$111.0  
BILLION**

as of June 30, 2019

### Environmental Integration



ESG Risk Factor  
Investment Management  
Agreement



ESG Score Analysis



Dedicated Sustainability  
Investment Strategy

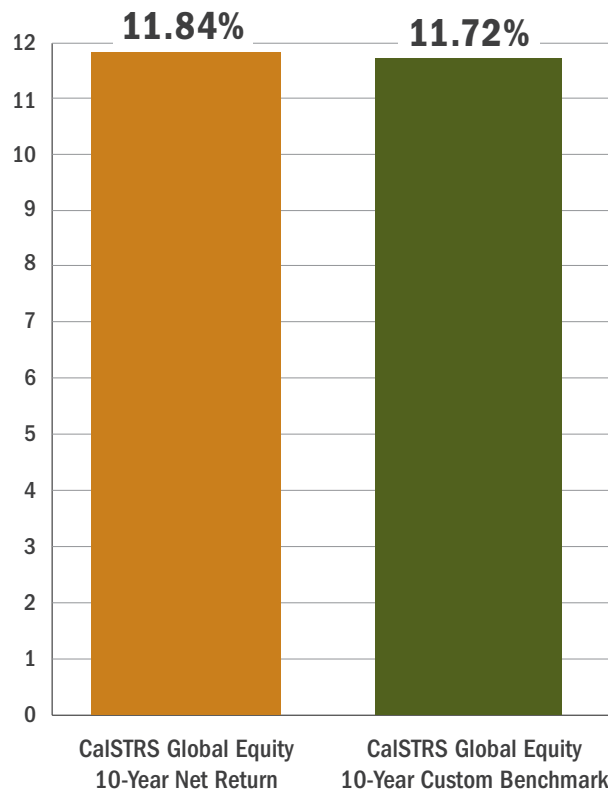
**CalSTRS Global Equity Program  
\$111.0 Billion**

**Core Portfolio  
\$109.4 Billion**

**Developing  
Manager Program  
\$1.6 Billion**

The CalSTRS Global Equity asset class manages U.S. and international publicly traded equities. Approximately half the stocks are internally managed, most of which are indexed to a market cap weighted index. The balance is actively managed by external investment managers.

### Asset Class Performance



### CalSTRS Low-Carbon Index

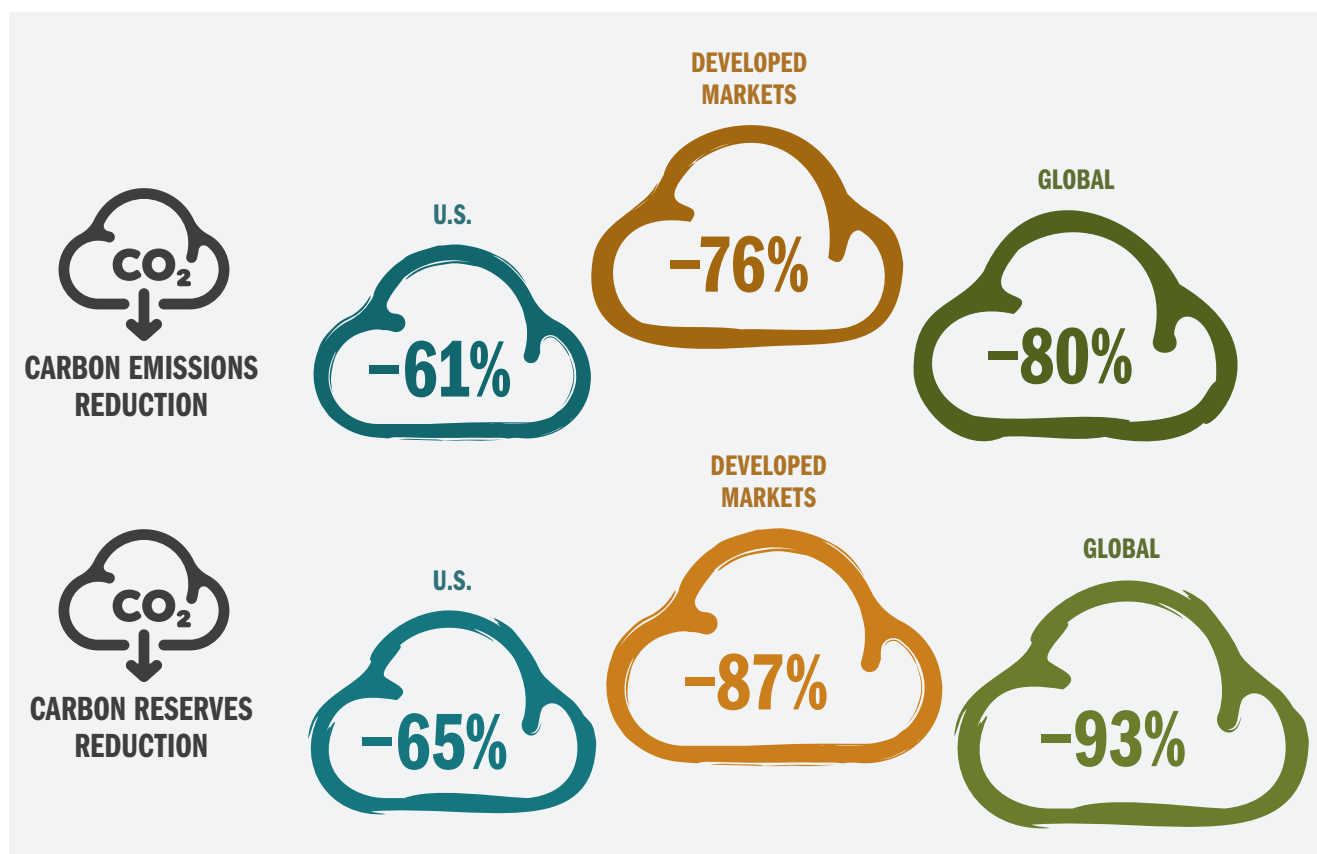
The initial implementation of CalSTRS' \$2.5 billion Low-Carbon Index took place July 1, 2017. The first phase was a \$1.3 billion investment in the U.S. market. The second phase, which took place November 1, 2018, was a \$1.0 billion investment in non-U.S. developed markets. The third phase will be a \$200 million investment in emerging markets.

The Low-Carbon Index is managed internally by Investments staff. The index's 1-year performance, over fiscal year 2018–19 was 10.51 percent, outperforming its benchmark by 46 basis points.

### MSCI ACWI Low-Carbon Target Index: Implementation Roadmap for \$2.5 Billion

|                |   |
|----------------|---|
| <b>PHASE 1</b> | <ul style="list-style-type: none"> <li>• \$1.3 billion into U.S. market</li> <li>» Implemented July 1, 2017</li> </ul>                    |
| <b>PHASE 2</b> | <ul style="list-style-type: none"> <li>• \$1.0 billion into non-U.S. developed markets</li> <li>» Implemented November 1, 2018</li> </ul> |
| <b>PHASE 3</b> | <ul style="list-style-type: none"> <li>• \$200 million into emerging markets</li> </ul>   |

The projected carbon emissions reduction and carbon reserves reduction for the \$2.5 billion allocation is presented below. Carbon emissions represent current emissions and carbon reserves represent potential future emissions. In the MSCI ACWI Index, utilities, materials and energy companies account for nearly four-fifths of the total current carbon emissions. Not surprisingly, energy companies represent more than 80 percent of total fossil fuel reserves.



## INFLATION SENSITIVE

Total staff

**10**

Total AUM

**\$5.57  
BILLION**

as of March 31, 2019

### Environmental Integration



ESG Risk Factor Investment Management Agreement



Investment Advisory Boards



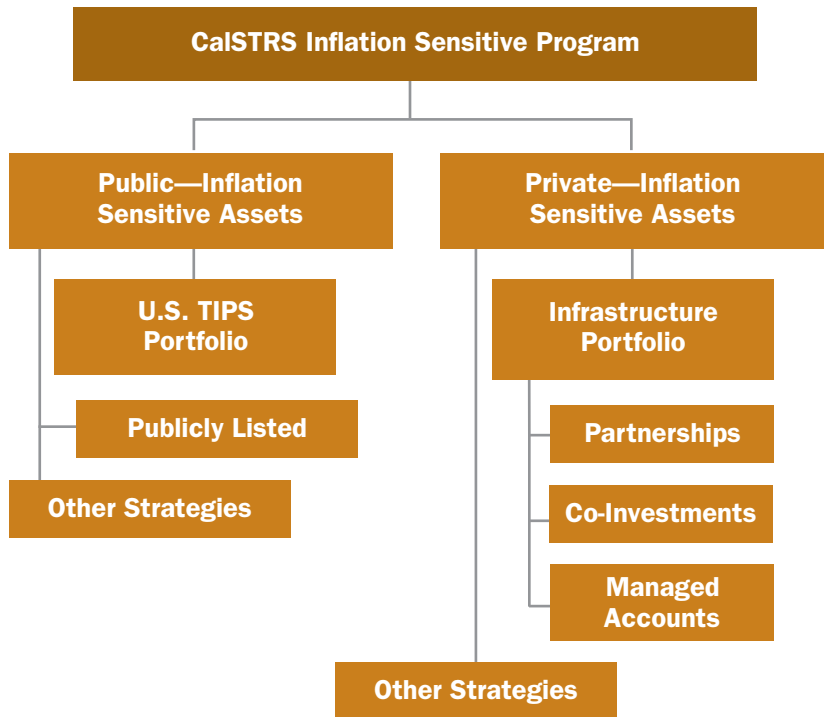
Commodity Risk Analysis



Environmental Impact Assessment



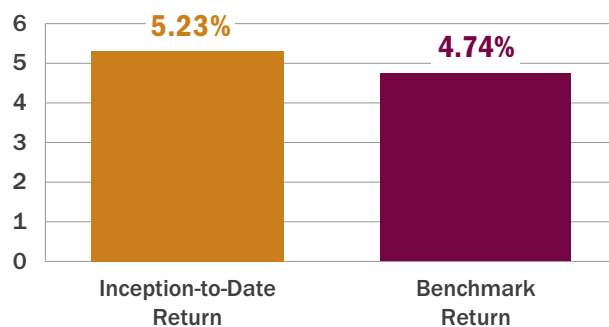
Engineering Technical Assessment



The Inflation Sensitive asset class consists of multiple sub-asset classes that, when combined, seek to provide investment returns in excess of the U.S. Consumer Price Index at a level that appropriately considers risk and return. The Inflation Sensitive Portfolio seeks to lower the macroeconomic risks that affect the other asset classes while capturing changes in inflation. Inflation Sensitive considers both public and private strategies in areas such as infrastructure, commodities, agriculture, forestland and Treasury Inflation-Protected Securities.





### Asset Class Performance

Inflation Sensitive generated a 5.23 percent inception-to-date return relative to a custom benchmark return of 4.74 percent. The program started in 2010 and has grown significantly since then. The current custom benchmark is a weighted blend of CPI+4%, Bloomberg Barclays U.S. Government Inflation-Linked Bond Index, Bloomberg Commodity Index and Alerian MLP Index.



**INFLATION SENSITIVE FOCUS**

The CalSTRS Inflation Sensitive asset class has **\$505** million invested in solar, wind and other renewable power generation and LEED-certified assets.

|   | <b>Asset Type</b>                       | <b>Approximate Investment Value</b><br>(In millions) |
|---|---|--|
|    | <b>Solar Power Generation</b>           | <b>\$342</b>   |
|    | <b>Wind Power Generation</b>            | <b>\$96</b>  |
|   | <b>Other Renewable Power Generation</b> | <b>\$49</b>  |
|  | <b>LEED-Certified Assets</b>            | <b>\$18</b>  |
|   | <b>Total</b>                            | <b>\$505</b>   |

## PRIVATE EQUITY

Total staff

**23**

Total AUM\*

**\$21.3  
BILLION**

as of March 31, 2019

\*AUM is defined as net asset value

### Environmental Integration



ESG Risk Factor  
Investment Management  
Agreement



Investment Advisory Boards



Dedicated Sustainability  
Investment Strategy



Environmental Impact Assessment



Engineering Technical Assessment

## NET ASSET VALUE BY STRATEGY

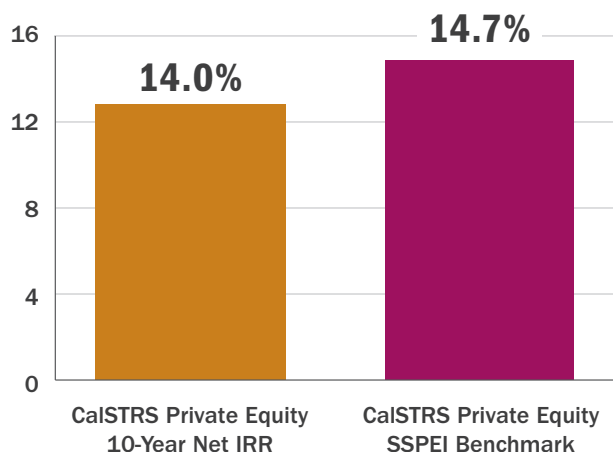
|                                      |  |                                       |
|--------------------------------------|--|---------------------------------------|
| Buyout<br><b>\$15.0</b> BILLION      | Venture Capital<br><b>\$2.4</b> BILLION  | Opportunistic<br><b>\$227</b> MILLION |
| Private Debt<br><b>\$1.9</b> BILLION | Special Mandates<br><b>\$1.3</b> BILLION | Core PE<br><b>\$387</b> MILLION       |

The Private Equity asset class was established in 1988 with a global mandate. Currently, 82 percent of the portfolio is U.S.-based. Components include limited partnership commitments, side-by-side co-investments and secondary transactions.

### Asset Class Performance

As of the first quarter of 2019, the Private Equity Portfolio has \$21.3 billion in assets under management, defined as net asset value, and has generated a 10-year net internal rate of return of 14.0 percent and a 13.0 percent net IRR since inception. The performance of the benchmark over the same period was 14.7 percent and 13.1 percent, respectively. CalSTRS has performed in line with the benchmark since inception.

As of March 31, 2019, the overall performance of the Clean Energy Portfolio is 0.81x on a multiple of invested capital, or MOIC, basis. The performance of the clean energy buyout funds, representing 80 percent of committed capital, has generated a 0.91x MOIC to date. The buyout portion of the portfolio represents \$181 million of remaining market value. The performance of the clean energy venture capital funds, representing 20 percent of committed capital, has generated a 0.48x MOIC to date. The venture capital portion of the Clean Energy Portfolio represents \$8 million of remaining market value.



| INVESTMENT SUMMARY: CLEAN ENERGY PORTFOLIO |                   |                                    |  |
|--|-------------------|------------------------------------|--|
| Investment Type                            | Vintage Year Span | Aggregate Commitment (In Millions) | Comments   |
| Buyout Funds                               | 2006–2010         | \$532.7                            | Buyouts involve the purchase of all or part of the stock or assets of a company using a significant amount of borrowed capital as well as equity capital. Borrowed capital typically consists of some combination of senior and subordinated debt. The company may be privately or publicly owned, or a subsidiary or division of a privately or publicly owned company.   |
| Venture Capital Funds                      | 2005–2012         | \$75.5                             | <p>Venture capital refers to investments in young emerging growth companies in different stages of development. The stages of venture capital investing include the following:</p> <ul style="list-style-type: none"> <li>• Seed Stage—An entrepreneur seeking capital to conduct research or finish a business plan.</li> <li>• Early Stage—A company developing products and seeking capital to commence manufacturing.</li> <li>• Late Stage—A profitable or near-profitable high-growth company seeking further expansion capital.</li> </ul> <p>The common theme underlying all venture capital investments is the high-growth nature of the industries in which the investee companies operate and the active role played by the investor to identify additional management expertise and provide general business advice.</p> |
| Co-Investments                             | 2005–2010         | \$83.4                             | Co-investments are privately negotiated purchases of equity or quasi-equity from privately or publicly traded entities. Such investments involve the purchase of unregistered securities, which by their private, illiquid nature command a premium over comparable publicly traded securities.  |
| <b>Total Clean Energy Portfolio</b>        |                   | <b>\$691.6</b>                     |  |

## REAL ESTATE

Total staff

**21**

Total AUM

**\$32.4  
BILLION**

as of June 30, 2019

### Environmental Integration



ESG Risk Factor  
Investment Management  
Agreement



Investment Advisory Boards



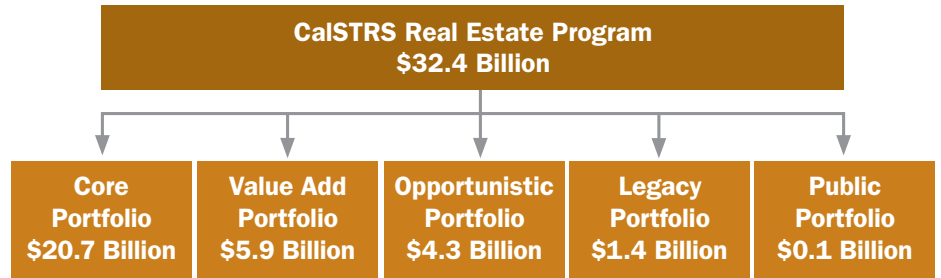
LEED & Energy Star Certifications



Environmental Impact  
Assessment



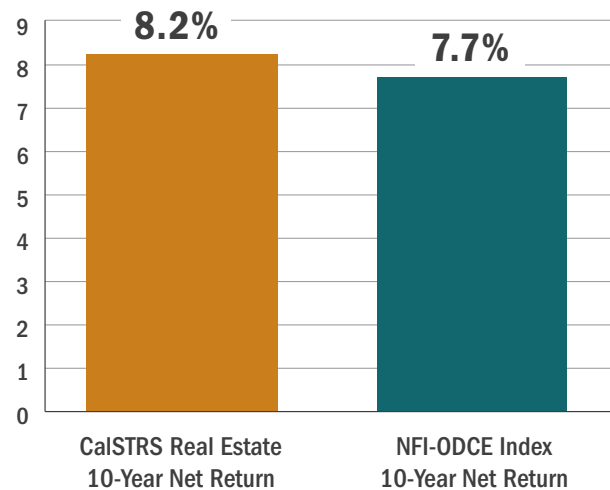
Engineering Technical  
Assessment



The Real Estate asset class strives to provide stable cash flow and enhanced yield while also providing total fund diversification and an inflation hedge. To accomplish this objective, the portfolio invests in both equity and debt positions across multiple property types, including office, retail, multifamily and industrial.

### Asset Class Performance

10-year net TWR as of March 31, 2019





## REAL ESTATE FOCUS

### PROGRAM SUMMARY

In 2003, Real Estate staff directed all separate account investment managers to include a conservation and sustainability assessment in the annual planning and budgeting process. Our goal was to enhance value, create awareness and become more socially responsible investors. The planning process challenges managers to assess strategies relating to green buildings. A green building is defined as a structure that is designed, built, renovated, operated or reused in an ecological and resource-efficient manner.

While we encourage green-related programs in the planning and budgeting process, all capital expenditures must be supported by appropriate return on investment measures and payback periods.

CalSTRS establishes benchmarks in order to track energy use, develop capital improvement plans, make energy efficiency upgrades and measure the benefits by reduced consumption of energy. By reducing resource consumption, value is added to the portfolio.

In 2005, CalSTRS partnered with the EPA's Energy Star program, which is widely accepted and used by leaders within the real estate industry. The partnership provided us with a tool to take control of energy use by providing the best information and resources for improving energy and environmental performance. More specifically, the partnership provided us with a tracking and audit tool to benchmark and measure energy consumption.

### THE RATING SYSTEMS



#### Energy Star

Energy Star, a voluntary labeling program for commercial and industrial buildings, is sponsored by the U.S. Department of Energy and the U.S. Environmental Protection Agency and managed by the EPA. It uses a scale of 1–100 to rate the relative energy performance of new and existing buildings. The rating, which is certified by a professional engineer, is based on the amount of energy the building uses over a 12-month period as evidenced by utility bills, the amount of CO<sub>2</sub> it emits, the nature and intensity of its occupancy, and its location.

A score of 75 or more qualifies a building for an Energy Star label. This means the building is in the top 25 percent of like structures in energy efficiency for the year rated.



#### LEED Certification Green Building Rating System

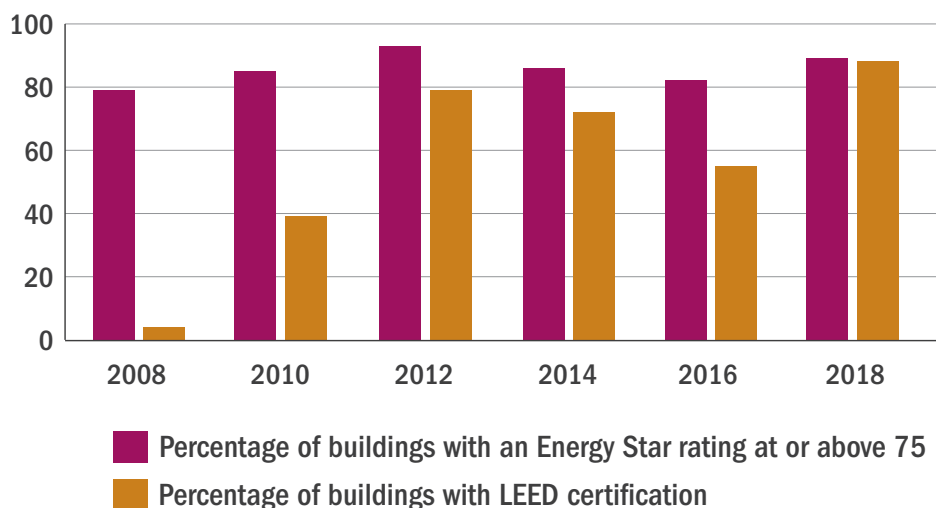
The Leadership in Energy and Environmental Design Green Building Rating System is the nationally accepted benchmark in the U.S. for the design, construction and operation of high performance green buildings. Established by the U.S. Green Building Council, LEED addresses different types of development with distinct rating systems, among them LEED for New Construction and Major Renovation, LEED for Commercial Interiors, and LEED for Existing Buildings: Operations and Maintenance.

The LEED rating systems and the four levels of LEED recognition—Certified, Silver, Gold and Platinum—reflect projected or actual performance beyond certain prerequisites in five critical areas of environmental sustainability: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.

The rating systems for the various types of development, and from property to property, require and reward somewhat different technologies and strategies and give different relative weight to the sustainability categories. Consistently, however, almost 50 percent of the points at stake are in the areas of energy and water conservation.

## SUSTAINABILITY ACHIEVEMENTS

As of June 30, 2019, nearly 90 percent of CalSTRS' directly controlled office buildings are Energy Star certified and have achieved LEED certification.



New or newly acquired buildings under redevelopment work are prevented from being eligible for LEED certification for that particular year. After the redevelopment work is complete, the buildings will be submitted for certification and the improvements will help them achieve LEED certification standards.

# LOW-CARBON SOLUTIONS INVESTMENT HIGHLIGHTS

CalSTRS has invested in sustainability-focused solutions that generate positive financial outcomes for more than a decade. As climate change affects all sectors within the CalSTRS Investment Portfolio, we continue to draw on this experience when investing in companies that support the world's transition to a low-carbon economy and generate competitive returns.

The investments highlighted in this section demonstrate three important themes: investments in renewable energy, investments in energy efficiency, and investments incorporating sustainable business practices.

## INVESTMENTS IN RENEWABLE ENERGY

Limiting global warming to 1.5°C will require dramatic changes in the way the world generates energy. The [United Nations' Intergovernmental Panel on Climate Change recent report](#) presents multiple scenarios that would draw down emissions and keep warming below 1.5°C. Within these scenarios, the IPCC shows that renewables will need to range from a 63 to 77 percent share of electricity by 2050. The [International Energy Agency](#) estimates that 23 percent of electricity is generated by renewables. An increase to at least 63 percent will require significant investments in renewable energy such as those listed on this page.

### Investment Example

CalSTRS owns a share of a new platform vehicle that will invest in a diversified mix of commercial and industrial solar photovoltaic facilities. This new vehicle is expected to fund the construction of 200 megawatts of solar assets across the U.S., with the initial investment targeting roughly 110MW of solar projects across the eastern U.S. The previous vehicle with the same developer delivered over 120 MWs of commercial and industrial solar in the U.S.



### Investment Example

CalSTRS recently acquired a portfolio of commercial and industrial solar projects across 12 U.S. states. The portfolio consists of 114MW of contracted solar power assets such as rooftop, parking lot and ground installations that range from 6.7MW down to 97kW. This fund, in addition to the several renewable assets owned by commingled funds, will continue to increase our exposure to renewable investments over time.

## INVESTMENTS IN ENERGY EFFICIENCY

The buildings and building construction sectors combined are responsible for 40 percent of global energy and process-related CO<sub>2</sub> emissions, according to the [International Energy Agency](#). Energy demand from buildings and building construction continues to rise at nearly 3 percent per year, driven by improved access to energy in developing countries, new building development, an increase in the amount of floor space per person used, and increased use of energy-consuming devices.

The amount of energy used to cool buildings has doubled since 2000, from 3.6 exajoules to 7 EJ. This makes cooling buildings the fastest growing energy end-use in buildings. Without energy efficiency gains, the amount of energy used to cool buildings could double between now and 2040 due to the increased use of air conditioning. Fortunately, solutions exist to help mitigate this potential increase in energy demand. By retrofitting current buildings and developing new buildings that take energy efficiency best practices into consideration, a significant amount of energy use could be avoided, preventing a significant amount of greenhouse gas emissions from electricity generation. The potential energy savings varies by market, but the IEA estimates that, on average, buildings in 2040 could be nearly 40 percent more energy efficient than today.

For CalSTRS, nearly 90 percent of our directly controlled office buildings are Energy Star certified and have achieved LEED certification, which demonstrates our commitment to energy efficiency. Some CalSTRS investments and energy efficient improvements are featured in this section.

### Investment Example

This Class A, 27 story, 490,049 square feet office tower is certified LEED Gold. Some of the anticipated key sustainability feature improvements include:

#### Window Film Installation

The tower was built with tinted single-pane aluminum frame windows on all four sides of the building. The poor thermodynamic performance of the windows and frames leads to solar heat gains through the glass, which translates into frequent comfort complaints from tenants. The solar heat gains were reduced after installing low emissivity nonreflective window film on the interior side of the windows on all sides of the building. This solution improved tenant comfort and saved cooling energy by reducing the radiant heat entering the building through windows. Benefits include the reduction of up to 85 percent of the heat from the sun, as well as 99 percent rejection of UV light and 95 percent reduction of the glare.

#### Building Management Software and Pneumatic Zone Control Upgrade

The building uses antiquated Siemens Apogee Building Management Software to control the HVAC systems, which offers limited functionality. The 2019 budget recommendation is to upgrade the BMS and pneumatic zone controls to direct digital control. This upgrade will allow greater functionality, easier maintenance and the potential for a zone level direct digital control retrofit. The greater control provides easier implementation of energy-efficient routines like demand-based duct static pressure and supply air temperature resets, as well as a smooth transition from free-cooling to mechanical cooling mode.

#### Periodic Boiler Shut Off

The building has three 2,000 kBtu/h atmospheric noncondensing boilers that supply hot water to the perimeter zone variable air volume reheat boxes via two 15-hp pumps. In order to reduce gas usage during the cooling season, the team decided to turn off the boilers during the warmer months of the year.







### Investment Example

Alexandria Real Estate Equities Inc. is an urban office real estate investment trust focused on collaborative life science and technology campuses with an asset base of 33.7 million square feet. Since 2018, Alexandria has issued \$1 billion in green bonds. CalSTRS has invested in these green bonds through our Fixed Income asset class. Alexandria’s eligible green projects include new or existing Class A development properties and tenant improvements that have received or are expected to receive Gold or Platinum LEED certification.

Alexandria Real Estate Equities’ 2018 Corporate Responsibility Report demonstrates its commitment to improving the buildings that it directly manages. Since 2015, both energy consumption and carbon pollution have been reduced by nearly 15 percent. Furthermore, the company’s goal is to reduce energy consumption and carbon pollution by 25 and 30 percent by 2025, respectively.



### ALEXANDRIA’S LIKE-FOR-LIKE REDUCTION GOALS & PERFORMANCE FOR BUILDINGS IN OPERATION<sup>1</sup>

| METRICS   | 2025 GOAL <sup>2</sup> | PROGRESS FROM 2017 TO 2018 <sup>3</sup> | CUMULATIVE PROGRESS SINCE 2015 <sup>4</sup> |
|---|------------------------|---|---|
|  <b>Energy Consumption Reduction (kWh)</b>             | <b>25%</b>             | <b>2.4%</b>                             | <b>15.3%</b>                                |
|  <b>Carbon Pollution Reduction (MTCO<sub>2</sub>e)</b> | <b>30%</b>             | <b>2.0%</b>                             | <b>14.5%</b>                                |
|  <b>Potable Water Consumption Reduction (gal)</b>      | <b>10%</b>             | <b>0.0%</b>                             | <b>1.3%</b>                                 |
|  <b>Waste Diversion (% in tons)<sup>5</sup></b>        | <b>45%</b>             | <b>2.0%</b>                             | <b>38.3%</b>                                |

1. Energy, carbon, and water values are for directly managed buildings.  
 2. Relative to a 2015 baseline.  
 3. Energy, carbon, and water values are for like-for-like buildings from 2017 to 2018.

4. Reflects sum of annual like-for-like progress since 2015.  
 5. Waste values are for the total portfolio, which includes both indirectly and directly managed buildings.

Source: [are.com/cr/ARECR2018.pdf](http://are.com/cr/ARECR2018.pdf)

# INVESTMENTS INCORPORATING SUSTAINABLE BUSINESS PRACTICES

The phrase “reduce, reuse, recycle” can be traced back to the environmentally conscious movement of the 1970s. The first Earth Day in the U.S. occurred on April 22, 1970, and the Environmental Protection Agency was established later that year. In 1976, Congress passed the Resource Conservation and Recovery Act to increase the reduction, reuse and recycling of waste as waste became a growing problem.

All resources—including materials, water, land and agriculture—face climate-related risks. Fortunately, through technology and innovation, “reduce, reuse, recycle” is a business best practice and not just a grand vision.

The following investment examples incorporate the “reduce, reuse, recycle” ethos and provide examples of sectors that are investing in sustainability-focused solutions.

## Investment Example

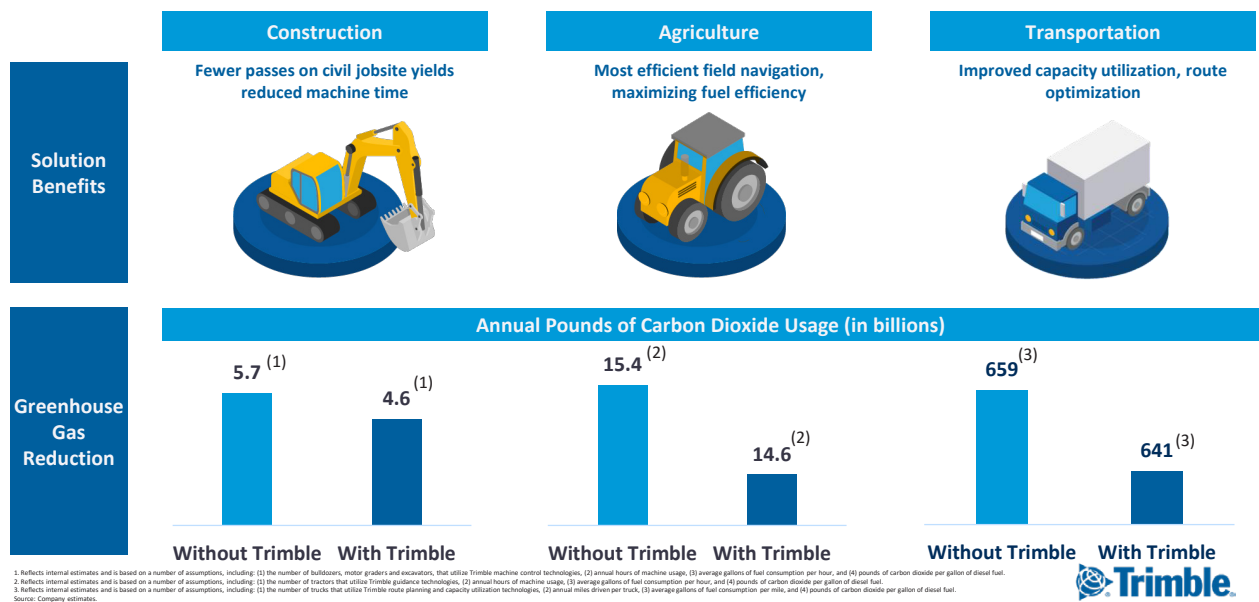
The African Development Bank is a regional multilateral development finance institution established to contribute to the economic development and social progress of member African countries. The AfDB green bond program supports its corporate priority of green growth through the financing of eligible climate change projects. AfDB has been issuing green bonds since 2013. In November 2018, AfDB came to market to issue a green bond in which CalSTRS’ Fixed Income asset class purchased \$40 million. One of its projects, the Tunisia-Project to Improve the Quality of Treated Water, will help improve the performance of sanitation services and the quality of treated wastewater in Tunisia. This project will benefit over 3,950,000 people through 30 wastewater treatment plants.



## Investment Example

The CalSTRS Public Equity Portfolio invests in Trimble, a company headquartered in Sunnyvale, California. Trimble delivers products and services that connect the digital and physical worlds, particularly in the agriculture, construction, geospatial and transportation industries. The company has developed core technologies in positioning, modeling, connectivity and data analytics that enable its customers to improve productivity, quality, safety and sustainability. By using Trimble software, hardware and services, a company can reduce its greenhouse gas emissions. The chart below illustrates the potential carbon reduction impact by using Trimble solutions across the construction, agriculture and transportation industries.

## Trimble Solutions Reduce Greenhouse Gas Emissions (cont.)



Source: [trimble.com/corporate/pdf/RCC/Trimble\\_Environmental\\_Solutions\\_201908071050.pdf](https://trimble.com/corporate/pdf/RCC/Trimble_Environmental_Solutions_201908071050.pdf)

# CALIFORNIA CLIMATE POLICY GOALS



California is a global leader in climate change mitigation efforts through bold climate goals and actions that use the state's power as the fifth largest economy in the world to drive positive action. As the second-largest pension system in the U.S., CalSTRS uses our influence to engage portfolio companies and advocate for policy that aligns to the long-term interest of the fund.

The state has ambitious and essential climate goals to transition to a more sustainable economy. These goals relate to clean electricity, methane emissions and hydrofluorocarbon gases, and electric vehicles. CalSTRS has demonstrated our alignment to California's climate goals through policy advocacy, corporate engagement and investment.

Three of California's climate policy goals are:

- Reduce greenhouse gas emissions 40 percent below 1990 levels by 2030 and provide 100 percent of the state's electricity from clean energy sources by 2045.
- Reduce methane emissions and hydrofluorocarbon gases by 40 percent.
- Add five million zero-emission vehicles to California's roads by 2030.



## CALSTRS' RESPONSE

### CLEAN ELECTRICITY

For the first time since California started to track greenhouse gas emissions, total electricity generation from zero-GHG sources (solar, hydro, wind and nuclear) exceeded generation from GHG-emitting sources.

Ultimately, California will need to see the absolute number of GHG emissions continue to decline. As shown in the chart to the right, California has experienced significant economic GDP expansion and population growth over the last two decades. Traditionally energy demand has increased as the population or GDP has increased, but with a significant increase in the use of renewables, energy management and energy efficiency, and a dramatic shift to electrification, California has witnessed a meaningful reduction in the relative number of GHG emissions when considered per capita or GDP. These relative GHG numbers are important and indicate that California is moving toward accomplishing its GHG and clean energy goals.

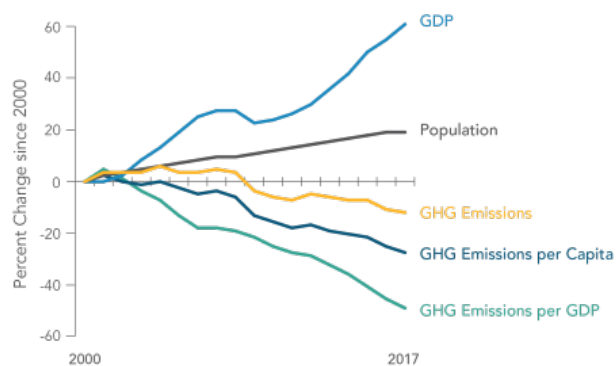
### ENGAGEMENT

## RE 100

As an asset owner, CalSTRS has public equity and fixed income exposure to thousands of companies, including many that are headquartered or have operations in California. As demonstrated in the engagement section of this report, we meet with and engage hundreds of companies each year.

When we engage portfolio companies, we encourage them to consider procurement and investment in renewable electricity. As of November 2019, more than 200 companies have joined RE100, which requires companies to make a global, public commitment to 100 percent renewable electricity. Companies can achieve 100 percent renewable electricity through producing renewable electricity from their own facilities or through purchasing renewable electricity from power generators and suppliers in the electricity

**California goal:** Reduce greenhouse gas emissions 40 percent below 1990 levels by 2030 and provide 100 percent of the state's electricity from clean energy sources by 2045



market. Some of these companies include Apple, Bloomberg, Google, HP, JPMorgan Chase, Procter & Gamble, Starbucks, Target and Walmart. CalSTRS staff encourages companies that we engage to consider joining RE100 because committing to 100 percent renewable electricity aligns to the transition to a low-carbon economy and mitigates climate-related risk for our Investment Portfolio.

### INVESTMENT

As a capital allocator, CalSTRS has supported California's climate goals of reducing GHG emissions and increasing the percent of electricity the state obtains from clean energy sources. From March 2018 to March 2019, the CalSTRS Inflation Sensitive asset class increased investment in solar, wind and other renewable power generation and LEED-certified assets by 38 percent, from \$364 million to \$505 million.

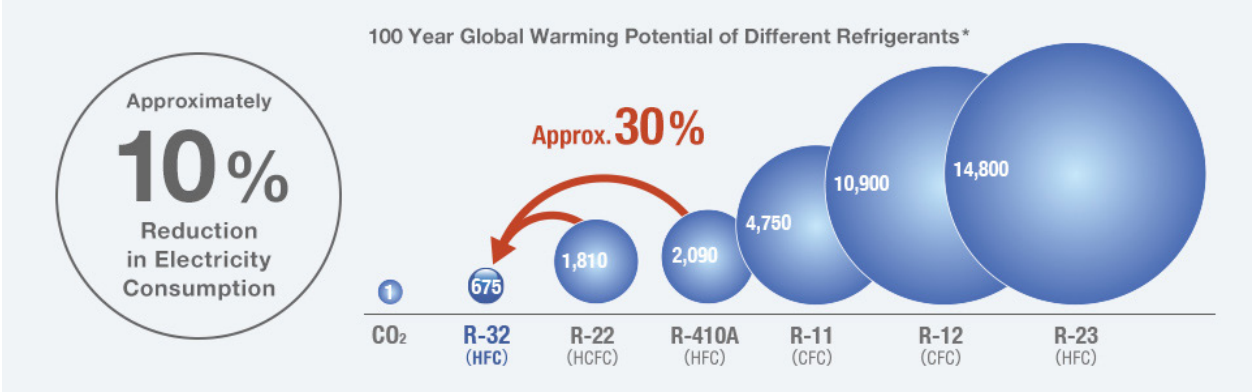
# CALSTRS' RESPONSE

## METHANE EMISSIONS AND HYDROFLUOROCARBON GASES

Methane is emitted during the production and transport of coal, natural gas and oil. Methane emissions also result from livestock and other agricultural practices, and from the decay of organic waste in municipal solid waste landfills. The Environmental Protection Agency reports that globally, 50 to 65 percent of total CH<sub>4</sub> emissions come from human activities. In 2017, methane accounted for approximately 10 percent of all U.S. greenhouse gas emissions from human activities. Methane's lifetime in the atmosphere is much shorter than carbon dioxide, but methane is more efficient at trapping radiation. Over a 20-year period, methane is a climate pollutant 84 times more powerful than carbon dioxide, according to the Environmental Defense Fund.

Hydrofluorocarbons are organic compounds that contribute to global warming and are frequently used in air conditioning and refrigerants. R-32 is a next generation refrigerant that efficiently carries heat and has lower environmental impact. Because R-32 efficiently conveys heat, it can reduce electricity consumption up to 10 percent compared to that of air conditioners using other refrigerants.

**California goal:**  
Reduce methane emissions and hydrofluorocarbon gases by 40 percent



Source: Daikin and Values for 100-year global warming potential (GWP) from IPCC Fourth Assessment Report Comparative 100-year GWP: HFC410A, 2,090; HFC32, 675

## CALSTRS' RESPONSE (CONTINUED)

### ENGAGEMENT

CalSTRS continues to engage oil and gas and gas utility companies on how they approach the issue of fugitive methane emissions. We have conducted a benchmarking study on the companies within CalSTRS' Russell 3000 portfolio and assessed the companies' disclosure of methane risk management strategy combined with an assessment of the potential leakage rate. Following engagements, many companies increased their disclosure of leak detection and repair activities.

### INVESTMENT

Daikin Industries, which CalSTRS is engaging as part of the Climate Action 100+ initiative, became the world's first company to succeed in applying R-32 to air conditioners by leveraging its expertise as the only manufacturer that develops and manufactures both air conditioners and refrigerants. As global warming continues, the use of air conditioning and therefore the use of refrigerants will increase. The use of inverter system air conditioners and new generation refrigerants, such as R-32, will become more important to combat climate change. Daikin's innovations, through its advanced air conditioning systems and new generation refrigerants, demonstrates its products are helping accomplish California's climate goals. As of October 31, 2019, CalSTRS had more than \$50 million invested in Daikin. Over the last five years, Daikin's stock return was more than 138 percent while the Tokyo Stock Price Index returned 39 percent. Daikin's stock outperformed TOPIX by 99 percent over the 5-year period.

# CALSTRS' RESPONSE

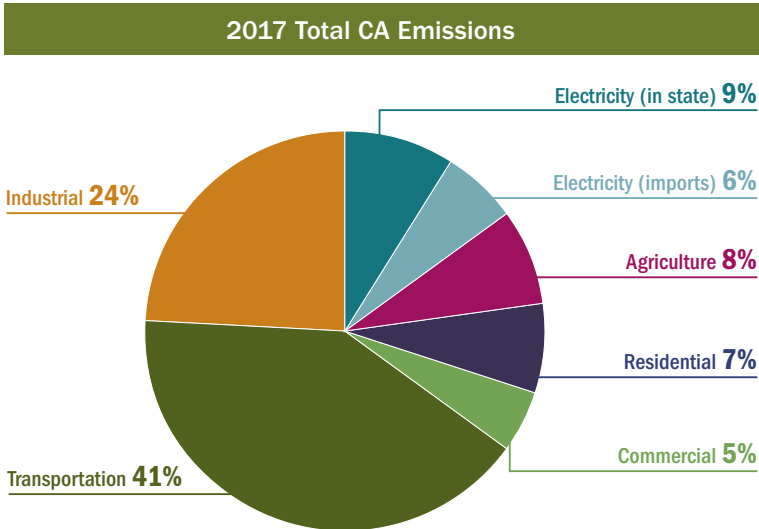
## ELECTRIC VEHICLES

While the transportation sector remains the largest source of GHG emissions in California, 2017 saw a 1 percent increase in emissions, the lowest growth rate over the past four years.

In September 2019, the *Los Angeles Times* reported sales of new electric vehicles increased 63.7 percent in the first half of the year, to 51,750 units. Though pure electric cars total 5.5 percent of California car sales, nearly 13 percent of overall car sales were electrified to some degree—pure EV, hybrid or plug-in hybrid.

In order to increase electric vehicle adoption, more automakers will have to produce more electric models at competitive price points.

**California Goal:**  
Add five million zero-emission vehicles to California's roads by 2030



Source: [ww2.arb.ca.gov/ghg-inventory-data](http://ww2.arb.ca.gov/ghg-inventory-data)

## ENGAGEMENT

Despite the federal roll back of U.S. Corporate Average Fuel Economy and greenhouse gas vehicle standards, Ford Motor Company, American Honda, BMW North America and Volkswagen Group of America, have entered into a compromise agreement with California that provides for emissions reductions on a nationwide basis, regulatory certainty, and incentives for increased deployment of electric vehicles. CalSTRS staff has engaged the majority of these companies to advocate for better fuel efficiency standards and the importance of reaching an agreement with California.

While we were pleased that many companies chose to pursue this agreement, we were disappointed that General Motors chose not to join, especially when it has a long-term public commitment to zero emissions and an all-electric future. In October 2019, CalSTRS and a coalition of more than 20 investors with \$1.1 trillion in collective assets under management called on General Motors, through a letter sent to General Motors' Chief Executive Officer Mary Barra, to join its peers in the compromise agreement with California and other states on clean vehicle standards. CalSTRS intends to continue engaging General Motors on this important issue.

# RISK MANAGEMENT



*The Teachers' Retirement Board policy delegates to CalSTRS staff the responsibility to manage risks within the global financial markets that the fund invests in. In order to fulfill this duty, staff uses a variety of methods through which risk can be determined, quantified and addressed. Staff also continuously considers and implements new means with which to identify market-impacting risk.*

## COMPLEXITIES OF CLIMATE-RELATED RISKS

Addressing ESG-themed risks, especially climate-related financial risk, is difficult for several reasons: data around climate change continues to evolve and remains inconsistent and challenging to compare; the data that does exist is often immaterial to the investment decision-making process; and climate change risk management is based largely on events that are yet to occur, so there is no prior climate crisis from which to evaluate outcomes. As a result, considerable uncertainty exists among climate experts as to how fast and to what degree climate impacts will be seen and felt.

These challenges do not alleviate staff's responsibility to manage risk, but they do make the job more complex. To help manage the complexities of climate-related risks, staff is committed to partnering with and regularly evaluating leading data providers and advisers, and using the most meaningful available frameworks and platforms to understand how our portfolio can be positioned to be climate resilient. Furthermore, staff incorporates a robust stewardship program focused on engaging companies around how they manage their carbon exposure, fund managers on how they integrate ESG and climate considerations into investment decisions, regulators on how they integrate ESG and climate issues into rules and regulations, and government officials on how they give thought to ESG and climate change when considering legislation.

To date, staff uses two distinct approaches when considering climate-related risks:

- A static, point-in-time analysis that assesses both the aggregate and sectoral investment portfolio carbon exposure and considers how the fund's carbon exposure is aligned with climate scenarios that assume differing levels of global response to climate change. For this report, the point-in-time analysis was conducted by [Institutional Shareholder Services](#).

- A risk factor framework that considers how identified climate risk factors are evolving and impacting the response to climate change. For this report, and as seen in prior *Green Initiative Task Force* reports, staff used a Mercer Consulting climate risk factor framework.

CalSTRS acknowledges there are interested parties and stakeholders who are calling on us to divest of our holdings in fossil fuels. We believe divestment is a last resort action that can have a lasting negative impact on the health of the fund, while severely limiting our ability to shape corporate behavior for long-term sustainable growth. It is imperative we continue to actively engage on climate change issues, including with the fossil fuel industry. We are focused on understanding and responding to the risks that climate change presents to our portfolio and to sustainable economic growth. Our engagement will reduce carbon emissions in the global economy and our low-carbon work plan will help position our portfolio to be resilient in a changing world.

# PORTFOLIO CLIMATE-RELATED FINANCIAL RISK AND PARIS AGREEMENT ALIGNMENT

## IN RESPONSE TO CALIFORNIA SENATE BILL 964

In September 2018, the Governor of California signed into law California Senate Bill 964 (Allen), which required the Teachers' Retirement Board to publicly report on CalSTRS' analysis of the climate-related financial risk of our public market portfolio, including the alignment of the portfolio with the Paris Agreement, California climate policy goals and the exposure of the portfolio to long-term risks. The board has delegated the duty to respond to staff.

CalSTRS determined the best way to align with SB 964's goal would be to work with outside resources to develop our climate risk exposure analysis. Over a period of approximately six months, staff met with multiple service providers that focus on climate risk analysis and analyzed each organization's ability to provide research that met the intent of the legislation. The ability to properly analyze a large and diverse global portfolio was also a key consideration when selecting a service provider.

Ultimately, we chose to work with Institutional Shareholder Services' ESG research teams to conduct a portfolio climate risk analysis and risk assessment. We asked ISS to identify our fund's total greenhouse gas emissions within the public market portfolio and analyze how those levels of emissions compare to the portfolio benchmark index based on June 30, 2019, holdings. We also asked ISS to break down portfolio emissions as being direct or indirect since risk exposure differs between emission type. Finally, we asked ISS to analyze how emissions varied by economic sector and how our current emissions profile aligns with different climate scenarios, including a scenario that aligns with the goals of the Paris Agreement. ISS was not able to provide an assessment of how our emissions profile aligns with a 1.5 degree Celsius scenario but will be able to conduct such analysis in the future.

In order to meet our climate risk assessment objectives, ISS determined the following three levels of analysis would be needed:

- Emission exposure analysis
- Emission attribution analysis
- Climate scenario analysis

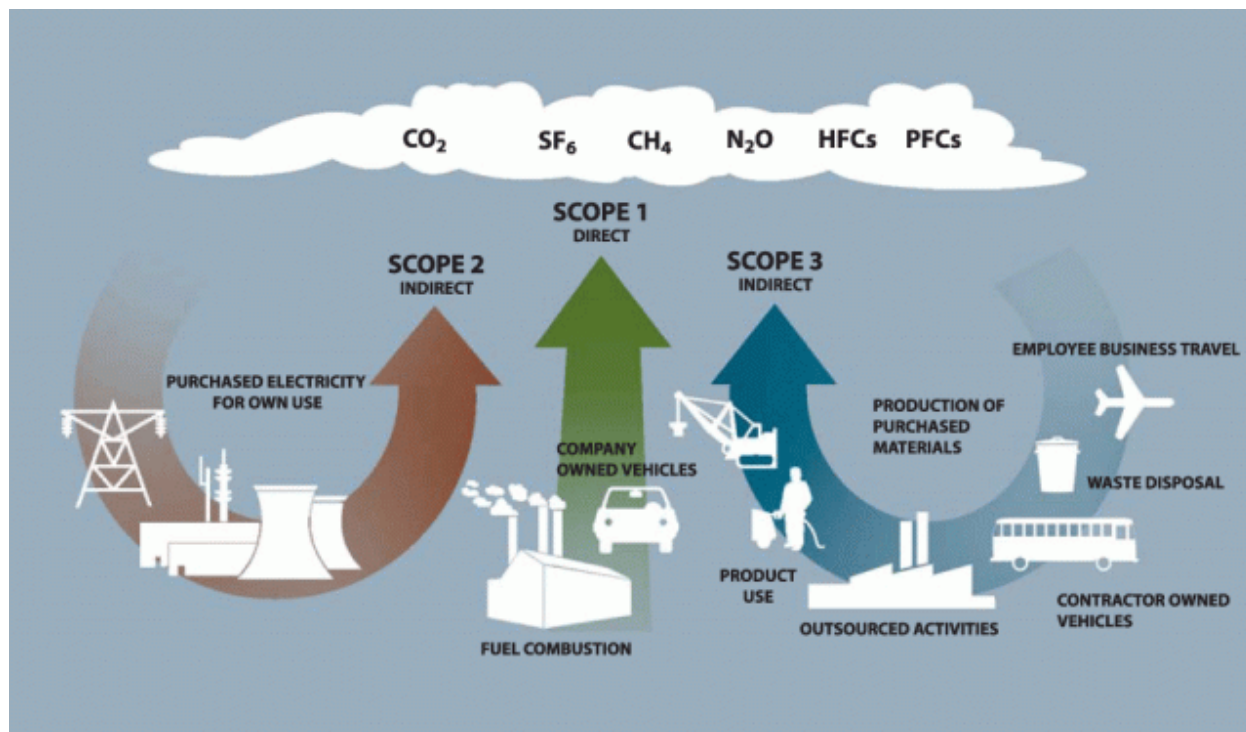
Staff recognizes there are currently significant limitations in this analysis, and analysis from other climate data service providers, including:

- It provides a static assessment of our portfolio and does not account for emissions reductions associated with changes in portfolio composition over time.
- It is not able to factor in the successful results of CalSTRS' stewardship activities that focus on engaging companies to reduce emissions to align with the goals of the Paris Agreement.
- It focuses on the aggregate level of company emissions and does not consider whether a company's emissions lead to lower emissions elsewhere.
- Corporate emissions data remains inconsistent and incomplete so estimation is involved in calculating carbon exposure.

However, despite these limitations, having actively engaged companies, fund managers, market regulators and government representatives on climate-related issues for many years, we understand the benefits of conducting this type of climate analysis. In addition to meeting the goals of the legislation, the results support our existing climate risk initiatives, particularly those conducted as part of our stewardship program. The insights can also help inform new climate-related strategies relating to the portfolio.

## DEFINING GREENHOUSE GASES

Greenhouse gases are often categorized as direct or indirect as well as identified as scope 1, scope 2 or scope 3 emissions. To provide context on what scope 1, 2 and 3 emissions are, the World Resources Institute developed the chart below.



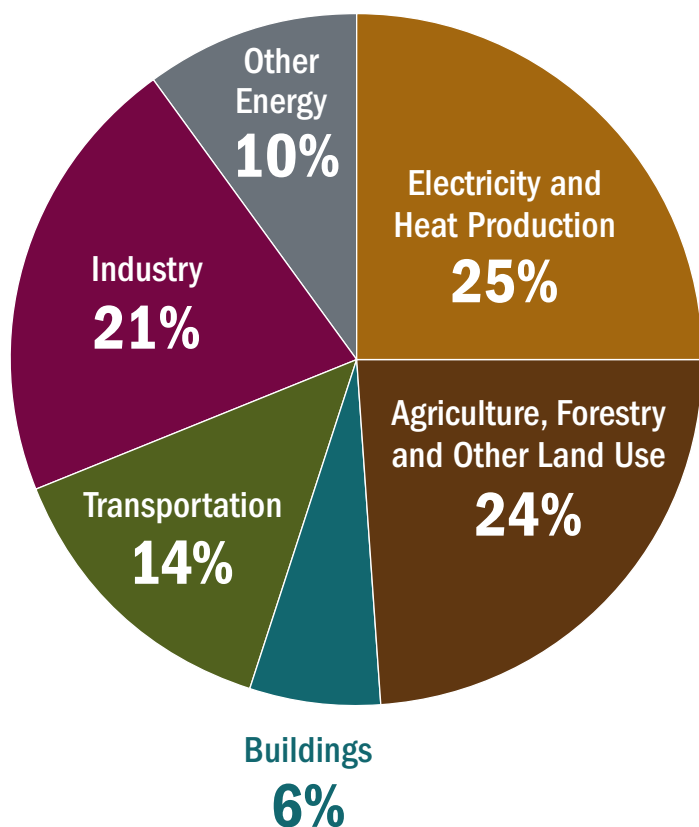
Source: World Resources Institute

The WRI notes that emissions result from a variety of activities, such as heating and cooling buildings, meeting-related travel, and shipping products to consumers. Direct (scope 1) emissions are emissions within a company's organizational boundary from sources the company owns or controls, such as business travel in a company car or the combustion of fuel in the company's boilers and furnaces. Indirect (scope 2 and 3) emissions result from a company's activities but are from sources owned or controlled by another company.



## UNDERSTANDING GLOBAL EMISSIONS SOURCES BY ECONOMIC SECTOR

As the Institutional Shareholder Services portfolio climate risk analysis discusses CalSTRS' risk exposure by sector, it's important to understand the source of global greenhouse gas emissions from an economic sector perspective. The chart below illustrates the sources of global greenhouse gases.



While the burning of coal, natural gas, and oil for electricity and heat is the largest single source of global greenhouse gas emissions—representing 25 percent—another 24 percent of global greenhouse gas emissions comes from agriculture, forestry and other land uses. Greenhouse gas emissions from industry, 21 percent of global emissions, primarily involve fossil fuels burned on site at facilities for energy. Transportation is the fourth largest source at 14 percent. Greenhouse gas emissions from this sector primarily involve fossil fuels burned for road, rail, air and marine transportation.

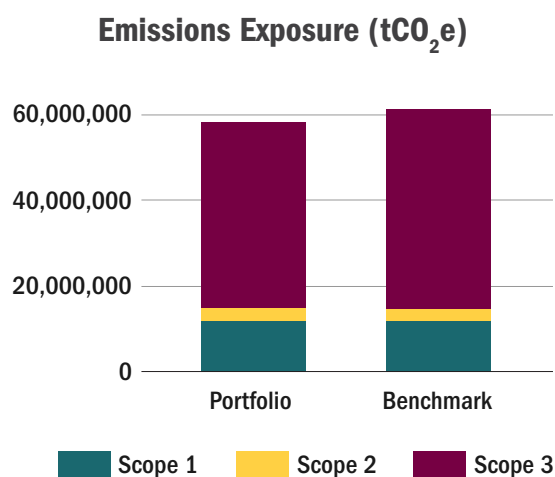


## ISS ASSESSMENT: EMISSIONS EXPOSURE ANALYSIS

Institutional Shareholder Services first analyzed the greenhouse gas emissions exposure of the CalSTRS public markets portfolios. To do this, ISS calculated the total carbon emissions of our portfolio using publicly available company emissions data and estimated company emissions when data was not available. ISS then calculated the total carbon emissions of the CalSTRS benchmark index using the same methodology. Finally, ISS compared the total emissions of the CalSTRS public market portfolio against the total emissions of the index.

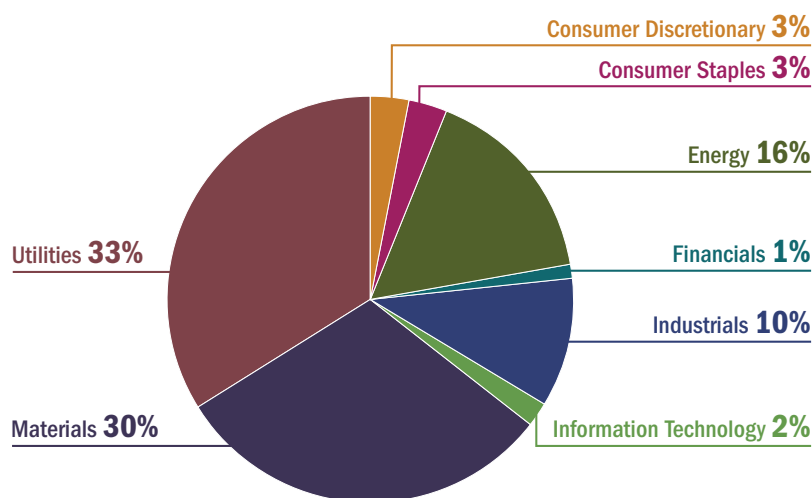
An analysis of the carbon emissions exposure of our public markets portfolios allowed staff to understand the aggregate greenhouse gas emissions in both our Public Equity and Fixed Income Corporate Bond portfolios. The analysis also compared the level of emissions to the respective performance benchmarks.

### CalSTRS Public Equity Portfolio



We closely track the emissions profile of the benchmark index. CalSTRS' total public equity emissions exposure is slightly below 60 million tons of CO<sub>2</sub> while the benchmark is slightly above 60 million tons. Our greenhouse gas emissions profile is similar to the index because we are largely a passive public equity investor. The differences in emissions, seen largely in scope 3 emissions, are attributable to the smaller, actively managed component of the Public Equity Portfolio.

### Sector Contributions to Emissions



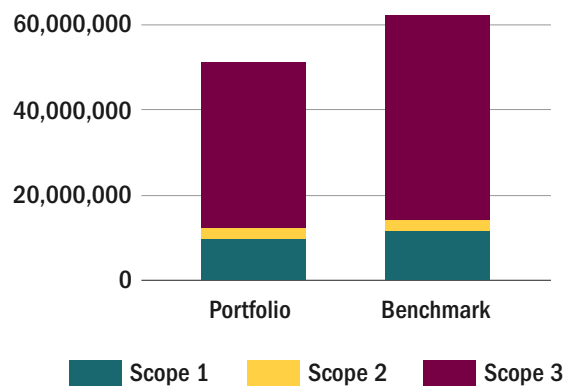
More than 60 percent of the CalSTRS Public Equity Portfolio's scope 1 and 2 emissions come from the utilities and materials sectors, while the energy sector, which includes traditional fossil fuel companies, comprises 16 percent of the portfolio's scope 1 and 2 emissions.

Emissions contributions for all other portfolio sectors is less than 1 percent for each sector.

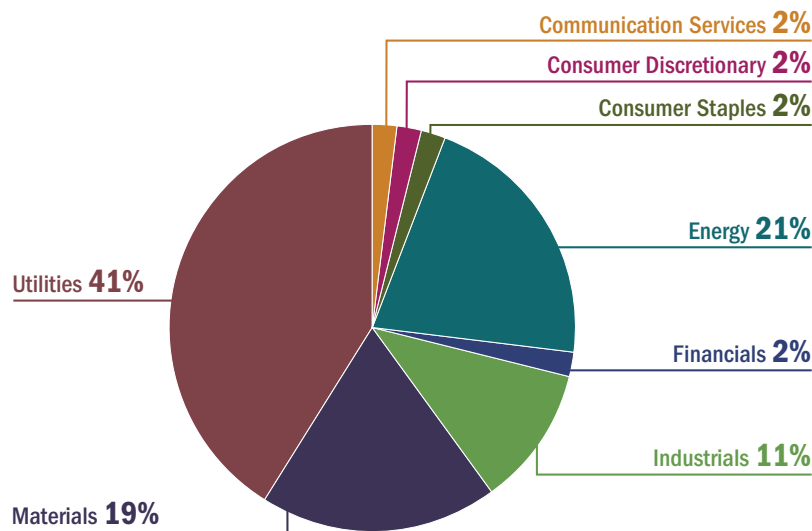
## CalSTRS Fixed Income Corporate Bond Portfolio

The charts below provide a similar analysis for our Fixed Income corporate bond emissions exposure. The Emissions Exposure chart below illustrates the Fixed Income corporate bond emissions exposure is approximately 18 percent less than the benchmark. While the Public Equity Portfolio is largely passively managed, the Fixed Income Portfolio is largely actively managed, meaning that Fixed Income staff has more opportunities to decide which individual companies within specific sectors to invest in. The Sector Contributions to Emissions chart below illustrates the majority of our Fixed Income corporate bond emissions exposure comes from the utilities and energy sectors.

**Emissions Exposure (tCO<sub>2</sub>e)**



**Sector Contributions to Emissions**



Emissions contributions for all other portfolio sectors is less than 1 percent for each sector.

## ISS ASSESSMENT: EMISSION ATTRIBUTION ANALYSIS

The emission attribution analysis examines the extent to which higher or lower scope 1 and 2 greenhouse gas emissions exposures between the CalSTRS Investment Portfolio and the underlying benchmark can be attributed to sector allocation versus stock selection. A portfolio with a larger amount of investment in an emissions-intensive sector will ultimately have higher GHG emissions exposure. However, this can be offset by the selection of less emissions-intensive companies from within that sector or by owning less of an emissions-intensive company than is held in the index.

This analysis considers the total carbon exposure of the portfolio, broken down by sector. Sector allocation effect indicates whether the difference in sector exposure results in higher or lower carbon exposure. Security selection effect indicates how the choice of companies and the amount of a company owned within each sector results in higher or lower carbon exposure.

### CalSTRS Public Equity Portfolio

As previously highlighted, the Public Equity Portfolio is largely passively managed, and therefore should be expected to have an emissions profile that is close to the benchmark. Differences in sector emissions exposure are largely due to different percentages of company ownership between the CalSTRS Public Equity Portfolio and the benchmark. The analysis indicates that our portfolio has a net emissions exposure that is less than 1 percent different than the benchmark. The Public Equity Portfolio invests less in the energy sector compared to the benchmark and the energy sector companies in the Investment Portfolio have lower carbon emissions profiles.

*The Public Equity Portfolio invests less in the energy sector compared to the benchmark, and those energy sector companies have lower carbon emissions profiles.*

### CalSTRS Fixed Income Corporate Bond Portfolio

The Fixed Income Corporate Bond Portfolio has a larger carbon emission variation to its benchmark than the Public Equity Portfolio. Security selection effects in the energy and materials sectors, and sector allocation effects in the materials sector, were the greatest contributors to the Fixed Income Corporate Bond Portfolio having net emissions exposure that is 15 percent less than its benchmark. The Fixed Income Portfolio invests less in the materials sector compared to the benchmark and the energy and materials sector companies in the Investment Portfolio have lower carbon emissions profiles.

*The Fixed Income Corporate Bond Portfolio's net emissions exposure is 15 percent less than the benchmark.*

## ISS ASSESSMENT: CLIMATE SCENARIO ANALYSIS

Senate Bill 964 required that CalSTRS conduct an analysis of the Teachers' Retirement Fund's alignment with the emissions reduction goals of the Paris Agreement, which calls on all countries to develop carbon reduction plans to hold global temperature increases at or below 2 degrees Celsius from preindustrial levels.

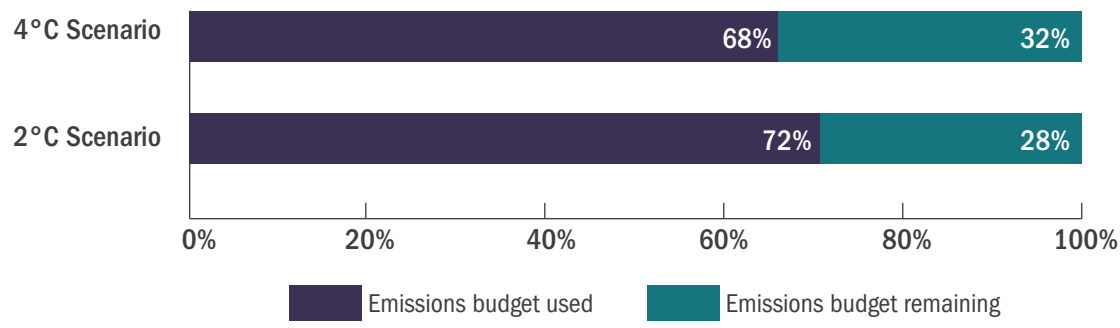
The climate scenario analysis conducted by Institutional Shareholder Services is based on two climate scenarios provided by the International Energy Agency in the report, *Energy Technology Perspectives 2015*. Each scenario expects a certain level of temperature increase by 2100: a 2 degree Celsius warming scenario (2DS), which represents the goal of the Paris Agreement, and a 4 degree Celsius warming scenario (4DS).

Each scenario is tied to a carbon budget. A carbon budget specifies the amount of fossil carbon that can be combusted worldwide to remain within a certain temperature increase limit. The carbon budget changes depending on the scenario. For example, to remain within the temperature limits of the 2DS, significantly less carbon can be combusted compared to the scenario that expects a much higher temperature increase such as the 4DS.

The climate scenario analysis considers how our existing portfolio aligns with the varying carbon budgets contained within the IEA's 2DS and 4DS. Under a 2DS, the corporate carbon budgets are expected to be much lower than under a 4DS, and high emitting sectors will be challenged to meet their carbon budget.

### CalSTRS Public Equity Portfolio

**CalSTRS 2019 Public Equity  
Emission Allowances Under Different Climate Scenarios**

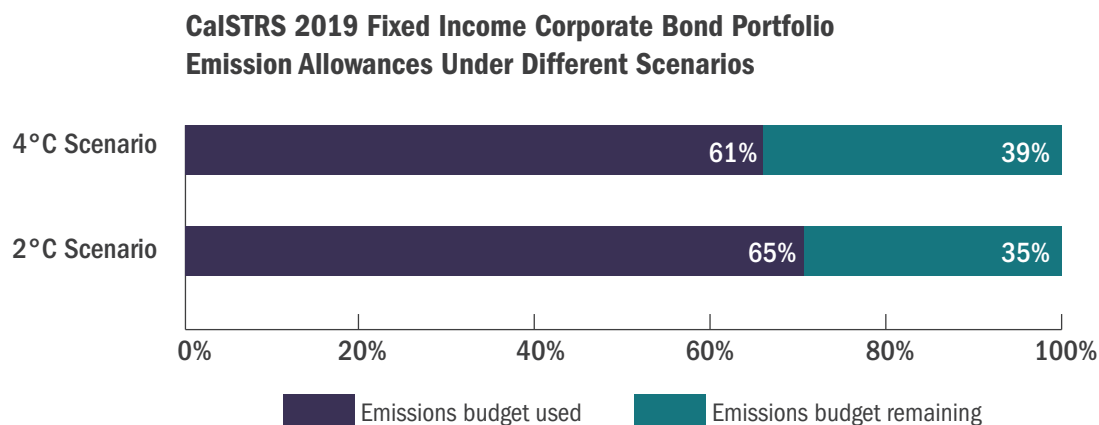


The CalSTRS Public Equity Portfolio is aligned with a 2 degree Celsius warming scenario until 2031 and aligned to a 4 degree Celsius and warming scenario through 2050. As of 2019, the CalSTRS Public Equity Portfolio emissions are 28 percent less than budgets that align with a 2DS.

*CalSTRS' current Public Equity Portfolio emissions is 28 percent less than what is budgeted to be aligned with a 2 degree Celsius warming scenario. Until the year 2031, the CalSTRS Public Equity Portfolio is aligned with a 2 degree Celsius warming scenario.*

## CalSTRS Fixed Income Corporate Bond Portfolio

CalSTRS' current Fixed Income Corporate Bond Portfolio emissions are 35 percent less than what is budgeted to be aligned with a 2DS.



The CalSTRS Fixed Income Corporate Bond Portfolio is aligned with a 2 degree Celsius warming scenario until 2033, and is aligned to a 4 degree Celsius warming scenario through 2050. As of 2019, the CalSTRS Fixed Income Corporate Bond Portfolio emissions are 35 percent less than budgets that align with a 2DS.

While climate scenario estimates can provide insights into analyzing and managing climate-related risks, they do come with limitations that have to be considered. These analyses:

- Represent snapshots of the CalSTRS Investment Portfolio as of June 30, 2019, and do not consider changes to portfolio composition and the associated emissions changes that would occur.
- Do not fully consider how CalSTRS' and other investors' stewardship efforts, including corporate engagement, result in corporate commitments to reduce emissions and thus impact carbon emissions pathways.
- Fail to capture nonpublic commitments and initiatives around emissions reductions by companies and assume identified commitments will be realized.
- Do not consider the transitional aspects of climate change, particularly how technology will impact emissions and impact carbon budgets.

*While climate scenario estimates can provide insights into analyzing and managing climate-related risks, they do come with limitations that have to be considered.*

# EVALUATING CLIMATE RISK



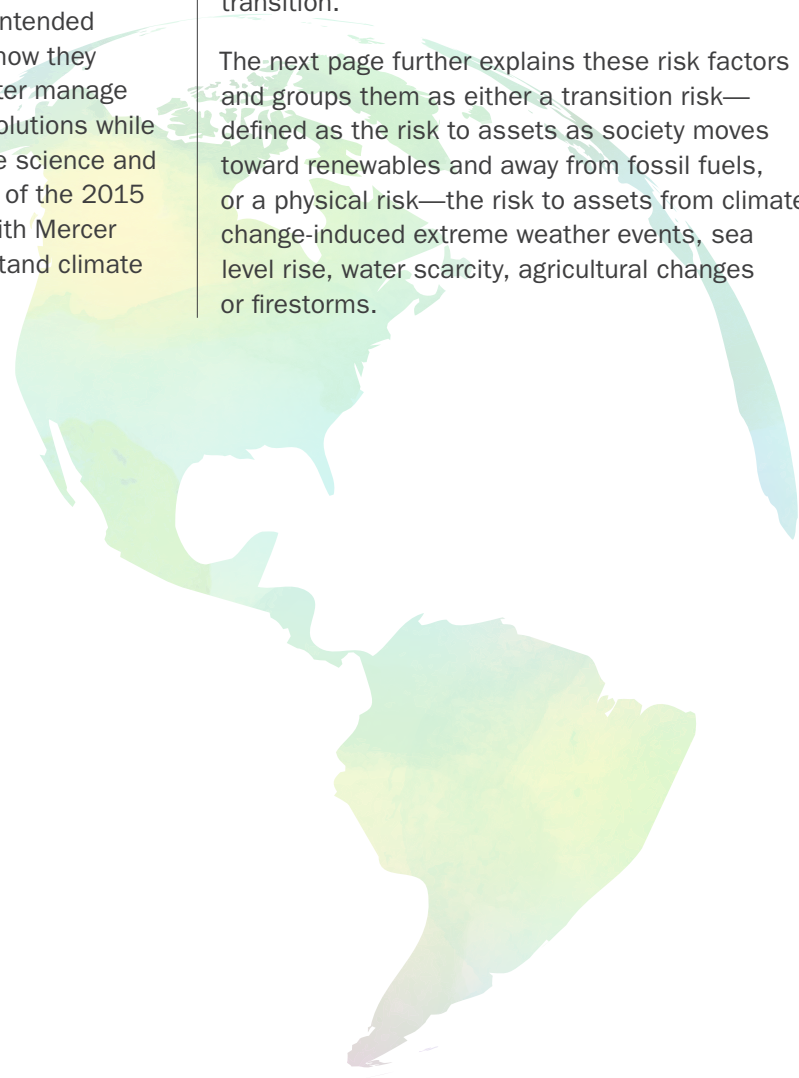
## USING THE MERCER TRIP FACTOR FRAMEWORK

In 2015, CalSTRS collaborated with Mercer Consulting and several other large institutional investors to produce *Investing in a Time of Climate Change—The Sequel*, a follow-up report to Mercer’s 2011 report on climate change and asset allocation. The 2015 edition focused on integrating climate change considerations into asset allocation decisions and was intended to provide guidance to investors on how they could position their portfolios to better manage climate risks and invest in climate solutions while incorporating more advanced climate science and scenario analysis. Since the release of the 2015 report, we have continued to work with Mercer and other investors to better understand climate scenario likelihoods and impacts.

One of the outcomes of our collaboration with Mercer was the classification of climate change-related investment risks, or risk factors, resulting from the transition to a low-carbon economy. According to the Mercer report, the four key climate change-related investment risks are: Technology (T), Resource Availability (R), Impact of Physical Damage (I) and Policy (P). Collectively, these risks comprise Mercer’s TRIP Factor Analysis.

By analyzing these risk factors, Mercer believes that investors would be better positioned to recognize how the transition to a low-carbon economy was occurring and, therefore, better able to manage the risks associated with that transition.

The next page further explains these risk factors and groups them as either a transition risk—defined as the risk to assets as society moves toward renewables and away from fossil fuels, or a physical risk—the risk to assets from climate change-induced extreme weather events, sea level rise, water scarcity, agricultural changes or firestorms.



**TECHNOLOGY (T)  
TRANSITION RISK**

**The rate of progress and investment in the development of technology to support the low-carbon economy.**

The technology factor captures technological advancement and the opportunity for increased efficiency through technological change.

The speed, scale and success of low-carbon technologies of existing sectors, or development of new sectors, are key considerations for investors.

**IMPACT OF PHYSICAL DAMAGES (I)  
PHYSICAL RISK**

**The physical impact of acute weather incidence such as extreme or catastrophic events.**

This factor can be interpreted as the economic impact of climate change on the physical environment caused largely by change in the incidence and severity of extreme weather events.

Examples include damage to property caused by flooding as a result of rising sea levels, and damage caused by hurricanes and wildfire.

**RESOURCE AVAILABILITY (R)  
PHYSICAL RISK**

**The impact of chronic weather patterns, such as long-term changes in temperature or precipitation.**

Resource availability is a new aspect being added to the previous Mercer study to identify how changes to the physical environment might impact investments reliant on the use of resources, such as water and agricultural resources, at risk of becoming scarcer or, in some cases, more abundant over the long term as a result of changes to weather patterns. The impacts on agriculture, energy and water are key.

**POLICY (P)  
TRANSITION RISK**

**Collectively refers to all international, national and subnational regulation, including legislation and targets, intended to reduce the risk of further man-made climate change.**

This factor can be interpreted as the level of coordinated ambition of governments to adopt and adhere to policies and regulations to reduce greenhouse gas emissions.

Examples of climate-related policy include greenhouse gas emissions targets, carbon pricing and energy efficiency standards.

Source: *Preparing Portfolios for Transformation, February 2017, Mercer*

CalSTRS staff uses the Mercer TRIP risk factor framework to identify the most widely accepted climate-related risks and periodically consider how these physical and transitional risks are evolving. Staff recently reviewed the risk factors and, as is widely recognized, determined the current global response to climate change does not align with the Paris Agreement goals of limiting the global temperature increase to 2 degrees Celsius.

Despite the existing levels of water stress around the world, and increasing severe meteorological and hydrological events, ambitious and stringent climate policy and large-scale low carbon investment and climate mitigation actions have yet to materialize. However, staff recognizes the global response to climate change, as realized through the low-carbon economy transition, could occur more quickly and with a higher magnitude than is presently being experienced. Because of this, staff will continue to monitor, analyze and consider climate risk indicators such as the Mercer TRIP risk factors.

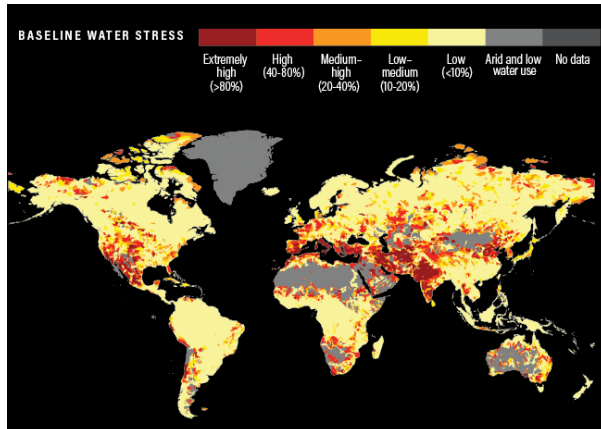


Data points CalSTRS considered, and which we continue to review, relating to the Mercer TRIP risk factors are resource availability, impact of physical damages, technology and policy, are detailed in this section.

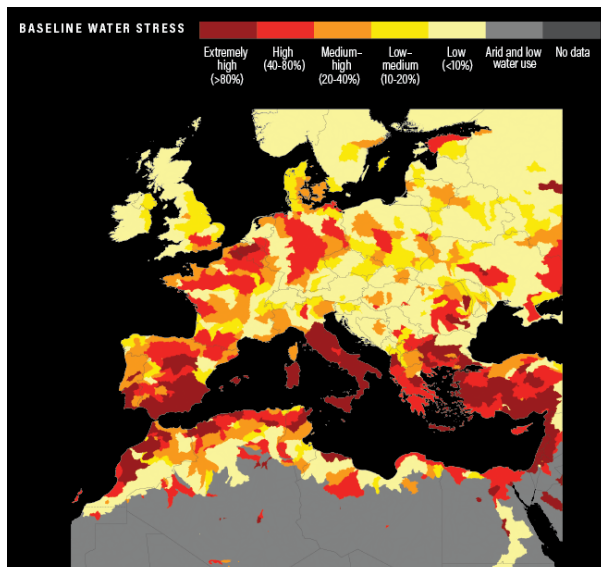
### PHYSICAL RISK: Resource Availability

The World Resources Institute provides data and analysis on global water stress, defined as the ability, or lack thereof, to meet human and ecological demand for water.

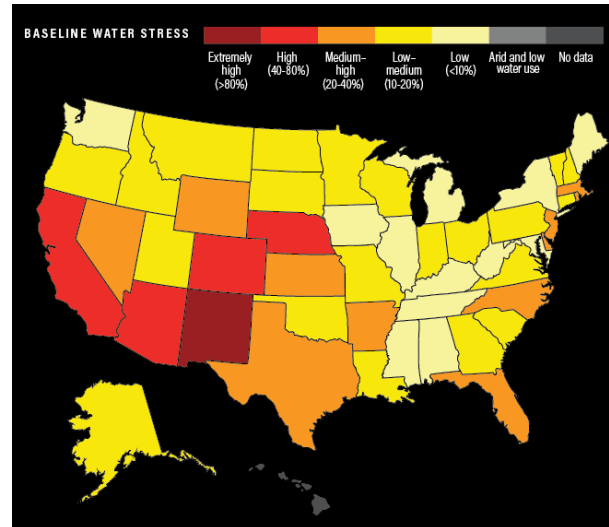
The map below reveals that 17 countries, home to one-quarter of the world’s population, face extremely high levels of baseline water stress. Forty-four countries, home to one-third of the world’s population, face high levels of water stress.



The following map shows the severity of the situation in the Middle East and North Africa, which is the most water-stressed region on Earth.



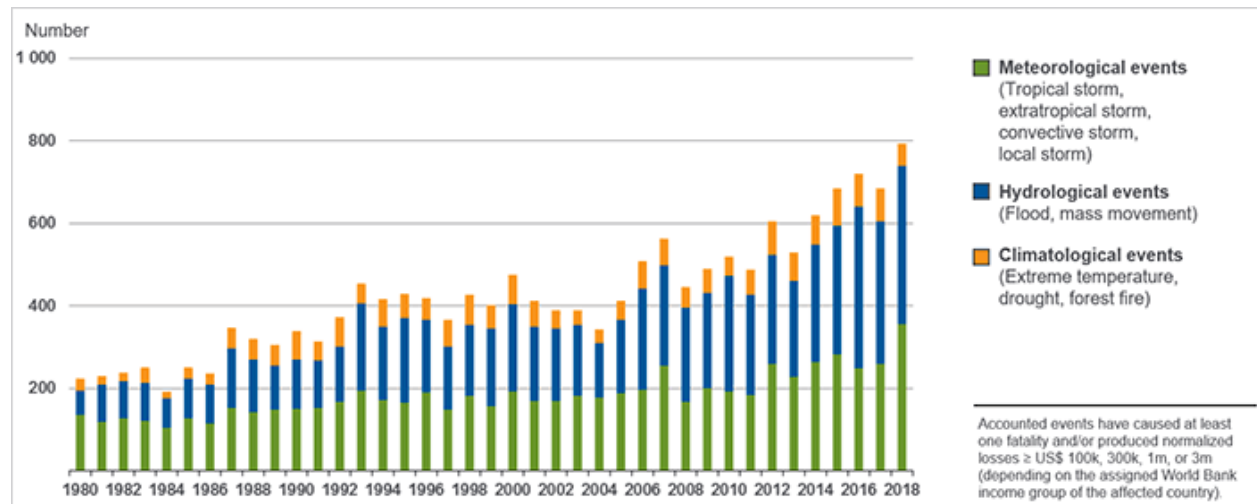
The map below illustrates that on average, the U.S. has low to medium water stress, but that differs by state.



Source: [wri.org/aqueduct](http://wri.org/aqueduct)

## PHYSICAL RISK: Impact of Physical Damages

Munich RE provides data on extreme weather events and the approximate costs of these events. This year-over-year analysis allows investors to see aggregate costs associated with extreme weather events and to what degree these events were meteorological, hydrological or climatological.



Source: ©2019 Munich Re, Geo Risks Research, NatCatSERVICE, as of March 2019

According to Munich RE:

- Overall losses from world-wide natural catastrophes in 2018 totaled \$160 billion, down from \$350 billion in 2017.
- Eight hundred and fifty events caused losses in 2018 compared to 740 events in 2017.
- Insured losses from these 2018 events totaled \$80 billion, down from \$140 billion in 2017.
- In 2018, insured losses were \$19 billion, or 31 percent higher than the average of the prior 10 years, from 2008 to 2017.

## TRANSITION RISK: Technology

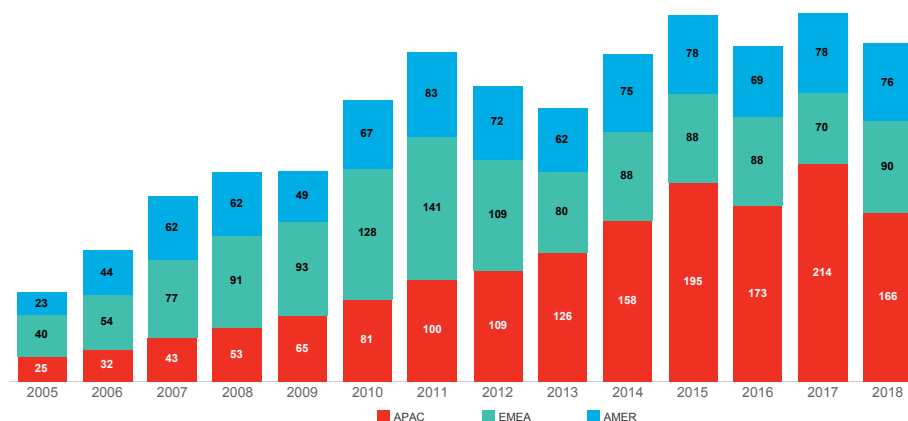
Bloomberg New Energy Finance provides robust data around investment in clean energy. This data is a good proxy for overall investment in climate-related energy solutions.

Annual Trends, New Investment

### Global New Investment in Clean Energy, by Region

2005 - 2018

\$bn



Global investment in clean energy projects decreased year-over-year from 2017 to 2018, falling from \$362 billion in 2017 to \$335 billion in 2018.

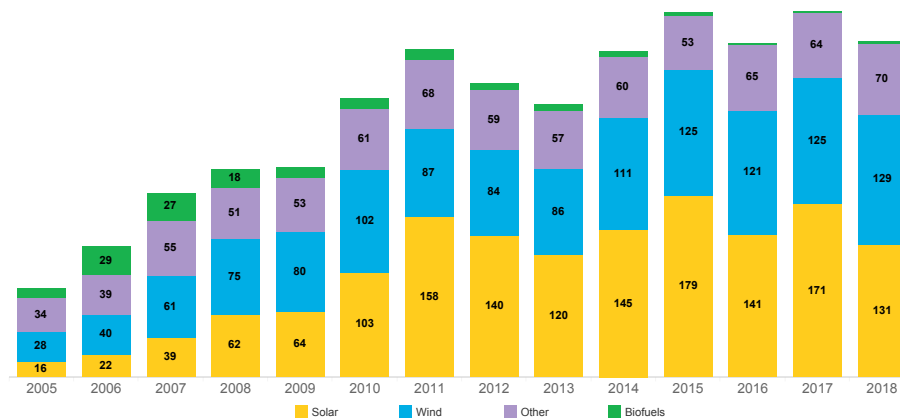
The Asia-Pacific region remained the dominant leader of global new investments in clean energy for each year since 2013, although the Asia-Pacific region's investments decreased by more than 20 percent from 2017 to 2018.

Annual Trends, New Investment

### Global New Investment in Clean Energy, by Sector

2005 - 2018

\$bn



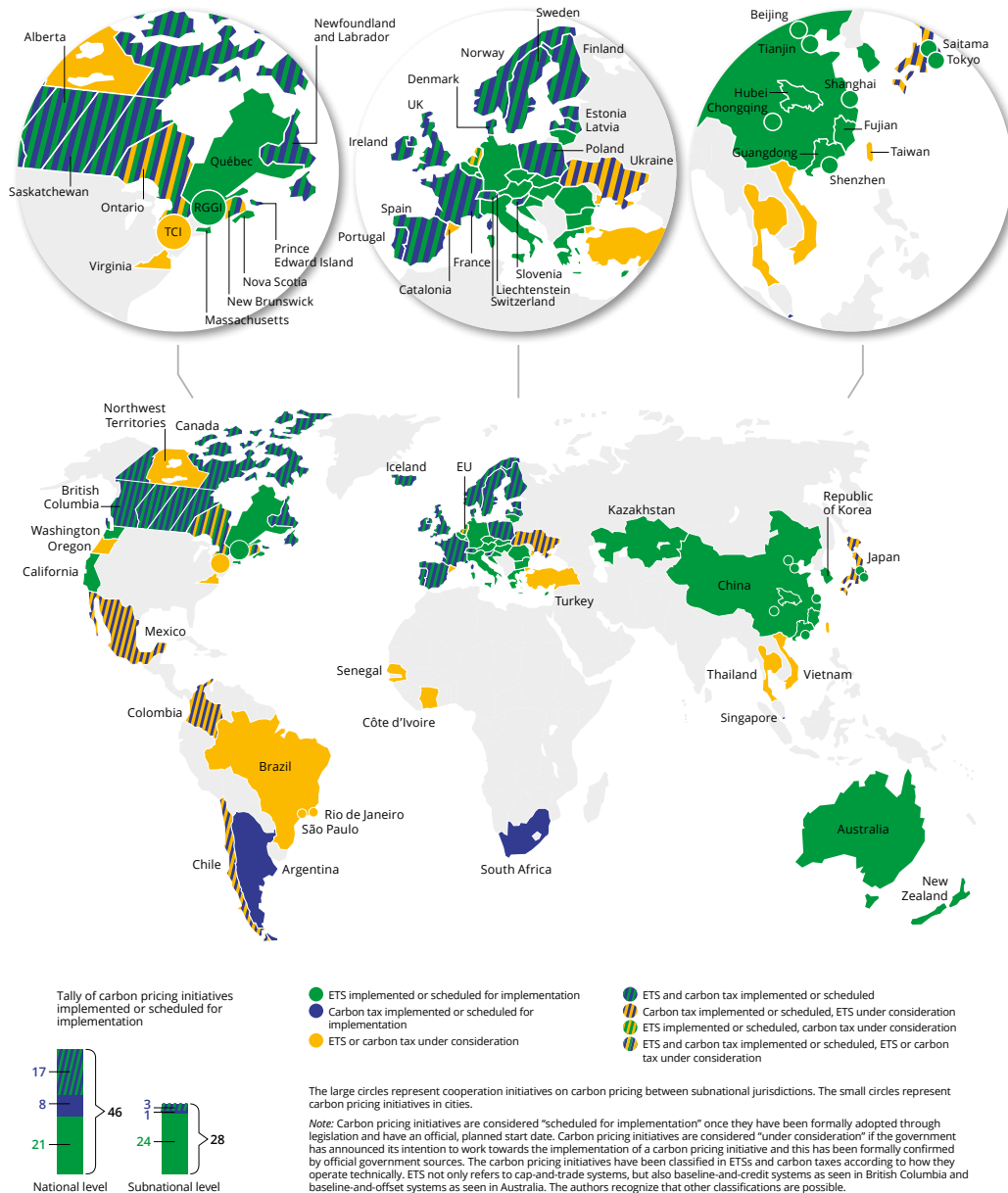
For the last several years, wind and solar have led the way in receiving new investment.

During the first half of 2019, asset finance of utility-scale generation projects, such as wind farms and solar parks, was down 24 percent at \$85.6 billion, due in large part to China's shift away from government-set tariffs to auctions for new wind and solar capacity. Financing of small-scale solar systems of less than 1MW was up 32 percent at \$23.7 billion in the first half of 2019.

## TRANSITION RISK: Policy

The World Bank Group provides a global perspective on carbon emissions-related policy and shows the regional, national and subnational carbon pricing initiatives that have been implemented, are scheduled for implementation, and under consideration as of December 31, 2018.

### Summary map of regional, national and subnational carbon pricing initiatives implemented, scheduled for implementation and under consideration (ETS and carbon tax)



Source: World Bank Group—State and Trends of Carbon Pricing 2019

While most regions have implemented some level of carbon emissions regulation, most countries around the world have not implemented, or do not seem to be considering, any type of emissions reduction program.








The World Bank reports that about 20 percent of global greenhouse gas emissions are covered by regional, national and subnational carbon pricing initiatives and, of these, less than 5 percent are currently priced at a level consistent with achieving the temperature goals of the Paris Agreement.















# METRICS AND TARGETS



*CalSTRS has developed a set of metrics and targets to support our goals of integrating ESG factors into investment management and improving our understanding of and ability to respond to the risks presented by climate change. These metrics and targets have been organized to reflect the Governance, Strategy and Risk Management sections of this report.*

*This is our first year reporting metrics and targets. We recognize the opportunity for ongoing improvement in this area and commit to working with the investment industry to refine our approach over time.*

| GOVERNANCE  |  |
|---|--|
| Objective   | Metrics  and Targets   |
| Board oversight of sustainable investment and ESG-related policies                      | <ul style="list-style-type: none"> <li>✓ Develop annual Investment Committee agenda item to review policies</li> </ul>   |
| Board oversight of stewardship strategies, efforts and outcomes                         | <ul style="list-style-type: none"> <li>✓ Develop annual Investment Committee agenda item to approve CalSTRS' stewardship and engagement program</li> <li>✓ Produce annual report to the Teachers' Retirement Board on proxy voting outcomes</li> </ul>   |
| STRATEGY  |  |
| Objective   | Metrics  and Targets   |
| Advance Teachers' Retirement Board Low-Carbon Transition Work Plan                      | <ul style="list-style-type: none"> <li>✓ Establish consensus between the Teachers' Retirement Board and CalSTRS staff to support common understanding of low-carbon transition impact on the CalSTRS portfolio</li> <li>✓ Analyze low-carbon transition readiness of portfolios</li> <li>✓ Expand stewardship activities through public policy engagement, corporate engagement and proxy voting to support an orderly low-carbon transition</li> </ul>  |
| Influence companies to focus on long-term value creation through stewardship activities | <ul style="list-style-type: none"> <li>✓ Engage portfolio companies on climate issues: carbon intensity, methane emissions, energy use</li> <li> Engagement lead on eight Climate Action 100+ companies</li> <li>✓ Engage portfolio companies on additional stewardship priorities</li> <li>✓ Sponsor shareholder proposals that promote climate risk and ESG risk management</li> </ul>  |
| Vote corporate proxies according to CalSTRS Corporate Governance guidelines             | <ul style="list-style-type: none"> <li>✓ Vote 100 percent of corporate proxies</li> <li>✓ Support climate and ESG-related proposals that align with long-term value creation</li> <li> Supported 54 percent of environmental shareholder proposals during July 1, 2018, through June 30, 2019.</li> <li> Continue to communicate to stakeholders, peers and partners on the efforts undertaken to advance the Low-Carbon Transition Work Plan</li> </ul> |
| Influence global public policy through stewardship activities                           | <ul style="list-style-type: none"> <li>✓ Communicate with regulators, exchanges and government officials promoting climate and ESG issues that align with long-term value creation</li> <li>✓ Support collaborative partners and investor organization efforts to scale activities and influence</li> </ul>  |

| STRATEGY   |  |
|--|--|
| Objective  | Metrics  and Targets                           |
| Integrate ESG, including climate-related factors, into public market portfolios      | ✓ Ensure 100 percent of managers reporting on ESG risk factor integration  |
|  | ✓ Survey Global Equity managers on climate risk consideration  |
|  | ✓ Invest in sustainability-focused solutions   |
|  |  \$286 million in Fixed Income green bond portfolio (\$700 million invested in green bonds from 54 issuers since 2009)            |
|  |  \$2.1 billion in Sustainable Investment and Stewardship Strategies sustainability-focused public equity portfolio                |
| Integrate ESG, including climate-related risk factors into private market portfolios |  \$2.68 billion in CalSTRS' Low-Carbon Index  |
|  | ✓ Ensure 100 percent of managers reporting on ESG risk factor integration  |
|  | ✓ Invest in sustainability-focused solutions   |
|  |  \$691 million in Private Equity Clean Energy Portfolio   |
|  |  \$505 million in Inflation Sensitive investments in solar, wind and other renewable power generation and LEED certified assets  |
|  |  90 percent of Real Estate directly controlled office buildings in Energy Star and LEED certified buildings                     |
| RISK MANAGEMENT  |  |
| Objective  | Metrics  and Targets                       |
| Conduct carbon risk assessment and alignment with Paris Agreement                    | ✓ Conduct triennial public markets climate scenario analysis   |
|  |  2019 Public Equity Portfolio emissions are 28 percent less than budgets that align with a 2 degree Celsius scenario            |
|  |  Public Equity Portfolio aligned with a 2 degree Celsius scenario until 2031  |
|  |  2019 Fixed Income Corporate Bond Portfolio emissions are 35 percent less than budgets aligned with a 2 degree Celsius scenario |
|  |  Fixed Income Corporate Bond Portfolio is aligned with a 2 degree Celsius scenario until 2033                                   |
| Conduct climate risk factor assessment   | ✓ Conduct annual review and analysis of impacts from physical and transitional risk factors  |

# CONCLUSION



*CalSTRS commits to enhancing the disclosure of CalSTRS climate-related risk. We will continue to produce a triennial Green Initiative Task Force report that aligns to SB 964 and the Task Force on Climate-Related Financial Disclosure framework recommendations. We intend to provide an annual update that highlights our low-carbon transition activities and how we incorporate risk and opportunities within the investment management process.*



**CALSTRS**  
HOW WILL YOU SPEND YOUR FUTURE?