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## **WRITTEN STATEMENT OF PAULA DIPERNA, Special Advisor, CDP, 25 July 2019**

Thank you for the opportunity to testify before you today, and I congratulate the vision of Speaker Pelosi and Chairwoman Castor to convene the Select Committee. I've had first-hand experience with the Speaker's commitment to addressing climate change, dating back to 2007 when she led a vanguard effort to create a zero emissions target for the House office buildings, and to do so, the US House of Representatives became a member of the also vanguard Chicago Climate Exchange at the time, where I as Executive Vice President.

Now, nearly a decade later, we come together again to address the complexities of climate change, surely one of the most vexing operational, socio-economic and policy issues before us, inescapable across all sectors and all constituencies. No doubt the disclosure repository of CDP, launched originally in 2003 as the Carbon Disclosure Project, and the first international system to gather environmental performance disclosure, contains information relevant to not only each state represented here on the Committee, but all 50 states, and I thank you for your service to the nation.

CDP disclosure is both qualitative and quantitative, and we send our standardized annual request for disclosure to most of the publicly trading companies in the world, covering climate change, water and forests issues. No other system like ours exists elsewhere. We make all our information available to the public, operate as a public good and to an extent model ourselves on the SEC EDGAR system for 10K filings. Our annual request is signed by roughly 550 institutional investors, asset owners and wealth managers---our signatories--who represent most of the financial services sector of the world. They use our disclosure as a reference on corporate environmental performance, strategic advantages and vulnerabilities, and a gauge for making investment decisions.

On climate change, today, roughly 650 companies in the US or about 70% of the S&P 500 in the US disclose to us and through us to our signatories, providing data on environmental performance, plans and imperatives.

CDP disclosure also information companies need to benchmark to their peers. Our system offers years of anecdotal and analytical information establishing both the do-ability and desirability of addressing climate change, expressed by companies themselves, and information about the cascade effects up and down the line to workers and average Americans who see climate change impacts up close.

In fact, perhaps there is no longer any such thing as a purely environmental problem. All environmental problems are now squarely socio-economic, and the climate crisis is absolutely inextricable from the socio-economics at work. For example, we've all heard of the recent research in the Federal Reserve's *2018 Report on the Economic Well-Being of US Households* that roughly 40% of adults would struggle to cover an unexpected expense of \$400, either by borrowing, selling something or not covering it at all.

So, obviously, if a house is even modestly damaged by flooding, the family would be unable to replace essentials, such as furniture, or the washing machine in the basement. Climate change related extreme weather events compound the precariousness of cash-strapped families.

Climate change is, in sum, a here and now issue that will hurt the poor and disenfranchised most of all.

A word about me: My cv is part of my written testimony but suffice it to say here that I have seen the climate change issue from 360 degrees, from coral reefs to carbon markets, literally. And I know well the proud US tradition of concern about climate change. In fact, I recently spoke with Dr. Warren Washington, a pioneer of climate modeling science, a long-standing researcher at the National Center on Atmospheric Research and recipient of National Medal of Science, who told me of his work advising six consecutive US Presidents up until President Obama, all of whom had shown concern about the possibility of climate change. He mentioned especially President George H.W. Bush, who not only helped set up the nation's first dedicated climate change research programs, but who also signed the US on to the original Framework Convention on Climate Change in 1992—I witnessed his pen crossing the paper, I should add.

This Convention, of course, provided the legal underpinning for the 2015 Paris agreement, currently the world's blueprint, which the US Administration has now rejected, breaking ranks with our own history of thoughtful action, and leaving us alone on earth to stand outside the global consensus that climate change must be addressed, but also dampening the incentives that could help us reap at scale the extraordinary opportunities that are at hand as we redesign, retool, rebuild and refit almost all our critical infrastructure, generating jobs and helping the US regain dominance of 21<sup>st</sup> century technological innovation and manufacturing. In fact, I sometimes feel like the rabbit in *Alice in Wonderland*, running around with a clock and running late, late, late for a very important date. A date we all have with our destiny to take leadership on the climate change question and recognize it for what it is--the greatest impetus in a generation to create jobs, re-set and modernize our economy and protect our people.

On the specific issue of today's hearing, climate resilience and business views, it is crystal clear that climate change has two basic faces: Risks and Opportunities. This month, CDP issued a comprehensive global disclosure report on both.

On RISKS: Of the world's 500 largest companies, 215 companies representing US\$16.95 trillion in market cap reported estimated financial risks from climate change at ~US\$970 billion), nearly a trillion dollars, with over half of those risks reported as likely/ very likely / or virtually certain to materialize in five years or earlier. Of these 215, 81 are based in the US.

The main drivers of this potential financial impact were:

- 1) Increased operating costs (due to higher compliance costs, increased insurance premiums etc.) at ~US\$179 billion;
- 2) The write-off of assets or their early retirements because of potential damage to them / being in high-risk locations at ~US\$170 billion;
- 3) Reduced demand for goods and / services due to a shift in consumer preferences totaling US\$102 billion; and
- 4) Changes in policy leading to write-offs, asset impairment and early retirement of existing asset sets totaling ~US\$73 billion.

ON OPPORTUNITIES: On the other hand, opportunities derived from addressing climate change outsize the risks, with 225 of the world's 500 biggest companies reporting potential upside financial impacts totaling over US\$2.1 trillion dollars, driven by potential increase in revenue due to demand for low emissions products and services, and meeting shifting consumer preferences. Of these 225, 89 are based in the US.

The main drivers of these opportunities were:

- 1) Increased revenue (through demand for low emissions products and services) - US\$970 billion;
- 2) Better competitive position to reflect shifting consumer preferences - US\$487 billion;
- 3) Increased revenue through new solutions to adaptation needs - US\$236 billion;
- 4) Increased capital availability (as more investors favor low-emissions producers -US\$198 billion.

In terms of opportunities, it is interesting to note that companies headquartered in the US in the G500 group report less than half the potential opportunities as their counterparts headquartered in the EU. As we know, the EU is evolving a clear policy framework consistent with the Paris agreement, and it could be that this coherence supports a business opportunity viewpoint by offering reasonable regulatory certainty, conducive to investment.

As to how these risks and opportunities are expressed by companies themselves, I will provide you some examples from a range of state and company types.

CALIFORNIA RESOURCES CORPORATION, a company engaged in hydrocarbon exploration, sees “Risks in changes in precipitation patterns and extreme variability in weather patterns leading to increased operating costs (e.g., inadequate water supply for hydroelectric plants or to cool nuclear and fossil fuel plants)” and also says this impact could be worsened because “Due to the severe drought in California over the last several years, water districts and the state government are implementing regulations and policies that may restrict groundwater extraction and water usage and increase the cost of water.”

EQUINIX, INC., which operates data centers in 52 metropolitan areas in 24 countries, says “The physical impacts of climate change, including extreme weather conditions such as heat waves, could materially

increase our costs of operation due to, for example, an increase in our energy use in order to maintain the temperature and internal environment of our data centers necessary for our operations.”

PG&E CORPORATION: As we all know, PG&E, which has 23,000 employees, has been forced into bankruptcy by the losses and potential claims against it related to the recent cataclysmic forest fires in Paradise, California whose devastation was compounded by drought and other factors. The bankruptcy affected not only the company, its customers and shareholders, but was also a blow to the transition to renewable energy since, PG&E had been a leading supplier of renewables and had itself recognized climate change risk. It has said “PG&E faces the risk of increased electricity demand and loads from its customers due to more extreme and prolonged hot weather events. Higher temperatures, including warmer daytime maximums and nighttime minimums, for prolonged periods, may also mean that certain electrical assets may fail, become less efficient or less reliable, and may need to be modified or replaced. Higher electrical loads increase stress and management of electricity on the transmission system. There is also the risk of increased PG&E customer outages during extreme heat wave events” as well as “...the risk of higher inundation and flooding potential at coastal and low elevation facilities due to sea level rise when combined with high tides, storm runoff, and storm surges. There is the risk of levee erosion or failure, putting assets at risk. PG&E also faces the risk of damage to substations and other gas and electric infrastructure.”

Other utilities have also been negatively affected by the PG&E situation. After the fires, Standard and Poor’s ratings stated “we lowered our credit rating on Edison International and its subsidiary Southern California Edison...and placed all of our ratings on the companies on CreditWatch with negative implications” which “reflects the increased likelihood that Edison will continue to experience catastrophic wildfires due to climate change.” S&P similarly downgraded San Diego Gas and Electric Company, for the same reasons. Subsequently, Fitch Ratings also revised its rating outlook for Edison International, from stable to negative adding “Given the unprecedented size of recent wildfires, future multi-notch downgrades cannot be ruled out.”

These credit ratings changes may seem far from the American people, but in fact they reflect a drain on financial stability and borrowing power of key employers and infrastructure providers, and can cut into the

value of pension fund holdings, 401Ks, etc. causing indirect hardship and heartbreak for ordinary Americans beyond even those who suffer loss of life and property.

SEMPRA ENERGY is a North American energy infrastructure company based in San Diego, California that has said, “damages from the 2007 wildfires exceeded SDG&E's [Sempra parent company] liability insurance coverage, ultimately leading to a \$351 million charge in 2017.”

WELLS FARGO with approximately 265,000 employees, says “Change in precipitation extremes and droughts can impact our customers. For example, droughts can drive up the cost of water and thereby affect our customers’ ability to payback their loans, especially if they are in in water intensive industries such as agriculture, semiconductors, energy, select tourism, breweries and beverage companies and more.” Wells Fargo also said “Global agreements were established as a result of COP21; however there remains a lack of clear, consistent global and national regulations associated with climate change.”

THE MOSAIC COMPANY is a Fortune 500 company based in Minnesota, the largest U.S. producer of potash and phosphate fertilizer, with facilities in Florida. It sees climate risks as chronic: “Changes in precipitation resulting in droughts or water shortages at our mines in Florida or Saskatchewan where we manage large volumes of water in our daily operations could restrict our operating activities, require us to make changes in our operating activities that would increase our operating costs, reduce our efficiency or limit our output.”

HARRIS CORPORATION, based in Jacksonville, Florida, with close to 17,000 employees, identifies increased severity of extreme weather events such as storms, cyclones and flood risks as a current and direct risk to its operations. Their disclosure states “For data centers, reduction in operational efficiency and increased component failure rates as increases in average temperatures and associated humidity will affect baseline design parameters. For example, the loss of ambient cooling potential. Changes in humidity may also lead to changes in patterns and rates of equipment corrosion. Higher humidity levels may also lead to new requirements to maintain internal environments within system tolerance ranges, as excess condensation can cause short-circuiting or water ingress.”

Harris also said it will, “expand the scope of events we consider in our planning to include more frequent and unusually disruptive storms in these locations, as well as the impacts of increased/more severe winter storms on our operations in the Midwest and Northeast.”

ARCHER DANIELS MIDLAND, based in Illinois, employs 31,000 employees serving customers in more than 170 countries. ADM can foresee potential loss of revenue ““if facilities are unable to acquire enough raw material to operate” due to “increased severity of extreme weather events” and ensuing impacts. It also says, that “the price of raw materials would increase, transportation via river would become difficult, and operations could be limited or halted.”

CONAGRA, with headquarters in Chicago, has said “Rising mean temperatures [leads to] reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions).”

In our Forests disclosure, CONAGRA also has said “Our paper suppliers are impacted by U.S. flooding caused by extreme weather and exacerbated by climate change, and forest fires exacerbated by drought that have appeared with increasing frequency over the past few years.”

YUM! BRANDS, based in Louisville, Kentucky, with 38,000 employees and operating 48,000 restaurants in 145 countries worldwide, said: “...Shortages or interruptions to our Concepts' restaurants could adversely affect the ...operations of our restaurants. Such shortages or disruptions could be caused by inclement weather, natural disasters, other a variety of other issues. Climate change influences several physical risk drivers that could negatively impact production, including extreme weather events such as tropical cyclones and changes in precipitation and temperature, forest fires, loss of ecosystem services, reduced crop yields, and thus, availability of certified sustainable material, which is already limited.”

EXELON CORPORATION, also based in Chicago and employing approximately 33,400 people worldwide with approximately 10 million customers in the US, has said it foresees risk as “Increased severe-weather events leading to increased capital costs (e.g., damage to facilities). Each utility plans for storm recovery costs in their annual operating budget, but costs can swing year to year by 10 to 100 million dollars (as incurred during Hurricane Sandy in 2012, and again in 2014 from February ice storms) depending on the

significance of the storm event.” In addition, Exelon says “Extreme weather conditions or damage resulting from storms could stress the Utility Registrants' transmission and distribution systems, communication systems and technology, resulting in increased maintenance and capital costs and limiting each company’s ability to meet peak customer demand.”

In the hospitality sector, HYATT HOTELS which employs approximately 45,000 people around the world, and another 70,000 through third-party owners and franchise partners, has described multiple risks, including “Rising mean temperatures...that could result in increased cooling demands and associated costs at our hotels. Wide-spread increases in energy demand may also increase the cost of utilities for our hotels.” In addition, “Hyatt’s coastal properties may need to make capital investments in systems to mitigate the effects of sea level rise, such as structural reinforcement and improved drainage systems. Sea level rise would also compound the risks of tropical cyclones and flooding mentioned above for Hyatt’s coastal properties, which could impact business continuity and increase capital costs needed for repairs. Sea level rise could also impact the desirability of particular locations or travel patterns of customers.”

In the real estate sector, JONES LANG LASALLE INCORPORATED is the second-largest company of its kind in the world, with operations in over 80 countries and a global workforce of 82,000. On climate risks, the company says “We expect insurance companies to raise premiums generally as the result of projected increase in extreme weather events resulting from the increase in *global temperatures*.” Also, “The occurrence of natural disasters can significantly increase the availability and/or cost of commercial insurance policies covering real estate, both for our own business and for those clients whose properties we manage and who may purchase their insurance through the insurance buying programs we make available to them. For LaSalle Investment Management, changes to weather patterns leading to increasing precipitation pose an indirect risk through rising insurance premiums as actuaries start to integrate climate change into their pricing models. These costs would normally be passed on but there is a risk they could impact the value of the asset.”

ELI LILLY, with headquarters in Indianapolis, Indiana has said, “Changing precipitation patterns, droughts, flooding and tropical cyclones could potentially damage our manufacturing, research and



development, and our housing/distribution facilities and those of our key suppliers, especially in flood prone areas...In 2017, our operations in Mexico, US and Puerto Rico were hit by a string of devastating earthquakes and hurricanes. Our principal active ingredient manufacturing occurs at our US, Ireland, and Puerto Rico sites. Puerto Rico, where we employ 1,400, was devastated by Hurricane Maria in 2017, causing power outages, food and water shortages.”

And the CDP repository has many years of similar descriptions from companies, and since all companies are employers, these and other risks described, all touch people.

But there is also an upside concerning people and the ongoing drive for jobs creation. The International Labour Organization (ILO) forecasts that “24 million new posts will be created globally by 2030,” with the caveat that, “the right policies to promote a greener economy must also be in place for this to happen, along with better social safety nets for workers.”

To take just one significant company, in Maryland, Lockheed Martin Corporation, which has more than 590 facilities in 50 US states and employs approximately 100,000 people worldwide, identified in our disclosure the use of lower-emission energy sources as a \$21 billion opportunity, which in turn presumably could generate significant new employment.

And just for perspective, while of course the use of artificial intelligence and the IT revolution have cut into jobs creation, on the other hand, “green jobs” exist across the spectrum of work that needs to be done. I helped spearhead an entity called the Jobs and Environment Initiative back in 2006 to survey the landscape then of what are overly simply called “green jobs,” in a range of states in the US and, for example we found in Florida, environmental demands were generating more jobs for sheet metal workers than geoscientists, in Ohio, more jobs for welders than biochemists, and so forth.

Regarding business expectation and preparedness for policy, there is significant evidence of wide-open eyes. Take, for example, the question of whether and how to “put a price on carbon”—meaning either a tax or cap-and-trade or combination.

As of our tally two years ago, 96 companies disclosed that they had already set an internal carbon price for the purpose of internal planning, indicating that they accept and understand that greenhouse gas emissions carry a hidden cost to their business which they seek to make visible using a projected surrogate cost, an internal carbon price. An additional 245 companies stated they are likely to be using an internal carbon price by the end of this year's disclosure cycle. And many companies using this internal mechanism indicate they do so because they wish to be better prepared for eventual regulation and/or are operating in a jurisdiction where they already face mandatory requirements, such as in the EU or in China.

Among the companies using an internal carbon price is Oklahoma Gas and Electric, which employs 2,500 people and serves more than 800,000 electricity customers. Citing opportunities ahead, OG&E disclosed that it "has leveraged its advantageous geographic position to develop renewable energy resources and completed transmission investments to deliver the renewable energy. The Southwest Power Pool (SPP) has begun to consider and authorize the construction of transmission lines capable of bringing renewable energy out of the wind resource area in western Oklahoma, the Texas Panhandle and western Kansas to load centers by planning for more transmission to be built in these areas."

Also of interest but less discussed, given the links between drought and water availability, and anticipated scarcities in predictable water supply, 89 companies have also begun using internal water prices to better gauge rising costs and risk, as of our 2018 Water Disclosure request.

And on the question of climate science, far from denying climate science, there is essentially no debate about it among any thoughtful business leaders. In fact, climate science could be said to be a new business language, given the growth in companies setting science based targets (SBTs) for greenhouse gas emissions reduction, meaning targets in line with the terms of the Paris agreement. As of the end of 2018, 150 companies disclosed they had or were in the process of setting SBTs, up from 128 companies in 2017 and 88 in 2016.

Regarding trends in capital investment, mainstream investors are also recognizing the significant upside of shifting capital to companies that take environmental and social factors into strategic account in their business management. According to the Sustainable Investment Forum of the US, for example, which tracks

relevant data, today 1 in 4 dollars invested in the US is screened for environmental, social or governance factors (esg), or 26% of the approximately \$46 trillion US-based assets under management. That is up from 1 in 6 dollars in 2019 and 1 in 9 dollars in 2012.

And, in a basic core indication of how integrated low carbon efficiency has become, the S&P 500 Carbon Efficient Index, which overweights carbon efficient companies and underweights carbon intensive companies, is now tracking virtually to a T with the venerable classic S&P 500, an alignment that indicates if nothing else that valuations are not reduced if low carbon intensity and energy efficiency are prioritized. On the contrary.

But despite progress, returning to the science, we see that the clock is ticking on reversing the most dangerous climate change trends, as greenhouse gas emissions continue to rise due to a variety of interlocking factors. So looking ahead to solutions and meeting new demands and needs, it could be worthwhile to think of what I call the three I's—indemnification, insurance and infrastructure.

First, indemnification. Currently the risks of climate change are bouncing around the economy like a wayward pawn on a chessboard looking for a place to land. They are not hitting the general economy yet because they are not priced in yet—but costs there are, and they are being borne either by the government and taxpayers, through FEMA and other social safety net programs, already stretched thin; insurance companies; or the victims themselves, who have no recourse, either because they are cash-strapped, under-insured, or just plain unable to respond to catastrophic extremes.

So perhaps new forms of indemnification will be needed to absorb risks and insulate at least the individual victims.

This leads to insurance.

The Committee will be hearing from Zurich Re, of course. But for additional relevance, according to a July 2018 overview report on climate risk by the Sustainable Insurance Forum and the International Association of Insurance Supervisors:

On insurance market risk, the report says: “From a pricing risk perspective, insurers’ capacity to write insurance business may be constrained by increasing physical risks to insured property and assets, if risk-based pricing rises beyond demand elasticity and customer willingness to pay. There is evidence that domestic property in high risk areas is being rendered uninsurable due to high exposure to physical risks, such as wildfires, storms and sea level rise. In the United States, US\$600bn of property within one mile of the coast is covered under the National Flood Insurance Programme, much of which will not be viable in coming decades, absent intensive adaptation investments.”

And on investment risk: “The profitability of insurer investment portfolios may be affected if invested in sectors or assets which may be especially at risk from either physical or transition-related factors. This could, at the extreme, constrain insurers’ capacity to pay future claims.”

Also, regarding insurance and risks, according to the 2018 Annual report from global insurance broker, AON, entitled *Weather, Climate and Catastrophe Insight*, in 2018: “64% global insured losses from natural disasters came from the United States; the years 2017 and 2018 were the costliest back-to-back years for weather disasters on record globally, with an economic impact of US\$653 billion, and the costliest for private and public insurers on record at \$237 billion.:

Moreover, of the \$225 billion economic cost of natural disasters in 2018, \$215 billion were weather related.

And finally infrastructure. We all know that America’s infrastructure is crumbling and in urgent need of modernization. To undertake what is needed will require decades of capital investment, but we also know that any dollar invested in infrastructure improvements pays dividends for years to come.

This is especially obvious as we celebrate the 50<sup>th</sup> anniversary of the Apollo 11 landing, one of the most fantastic accomplishments in our nation's history. The space program gave us much more than Tang—it built the communications systems that became the internet and gave the US such an edge in digital technologies. And consider the compounding benefits of investments in the US highway system, much of which also needs climate resilience updating, by the way.

There is room for an ambitious and comprehensive focus on not only modernizing infrastructure but designing and planning it with climate change trends in mind. Climate change resiliency means strengthened security--if we build it, we will have it when we need it. And a focus on climate change as an infrastructure opportunity, rather than an existential threat, can mobilize and galvanize the American people across the nation.

In fact, there are climate resilience infrastructure needs big and small vividly waiting to be met all around the nation. Through our CDP Cities program, we operate the Matchmaker portal where cities can showcase to investors their climate resilience related infrastructure needs, most of which have direct benefit where people live and work. Currently, in the states represented on the Committee alone, we have 158 projects currently needing funding, of which 108 have preliminary cost estimates totaling roughly \$10 billion in projected cost, ranging from the multi major Embarcadero Seawall renewal project in San Francisco, to smaller flood and mitigation projects needed valued at \$23 million in Gretna, Louisiana. Globally, there are about 650 costed Matchmaker projects seeking funding, half of which need funding of under \$1 million.

When it comes to infrastructure we all have our horror stories. In my own experience, one day earlier this month, not only did Amtrak come to a halt because of a fire in the rail tunnel now crossing the Hudson River—the walls were still so hot after the all-clear, they looked like the inside of a toaster as our train limped through. A few days later, flights from Reagan international were delayed for hours due to overheated airplanes, too hot to board, we were told, because of high external temperatures on the ground that prevented normal cool down after a flight. The airline company had to wheel in a portable unit to pump cool air into the cabin, a contraption that looked like a giant vacuum cleaner in reverse. Anomaly, maybe, but more likely a

harbinger of what is to come as we try to match our wits and technology to the exigencies of a changing climate. Perhaps there is even room for a Climate Resilience Infrastructure Act?

In sum climate change is present and costly to companies and average Americans, and coherent inter-sectoral policies would make the US less vulnerable. Thank you and I will be glad to answer any questions.

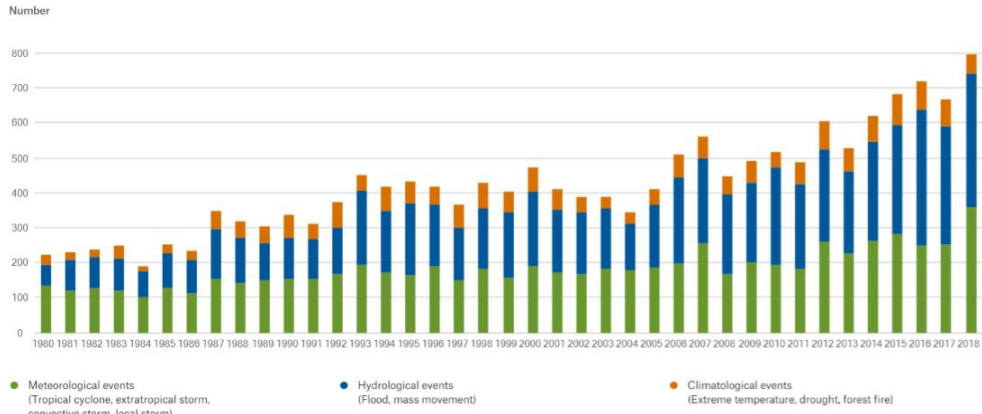
## **Natural Catastrophes on Rise**



NatCatSERVICE

Munich RE

**Number of events**  
Relevant weather-related loss events  
worldwide 1980 - 2018

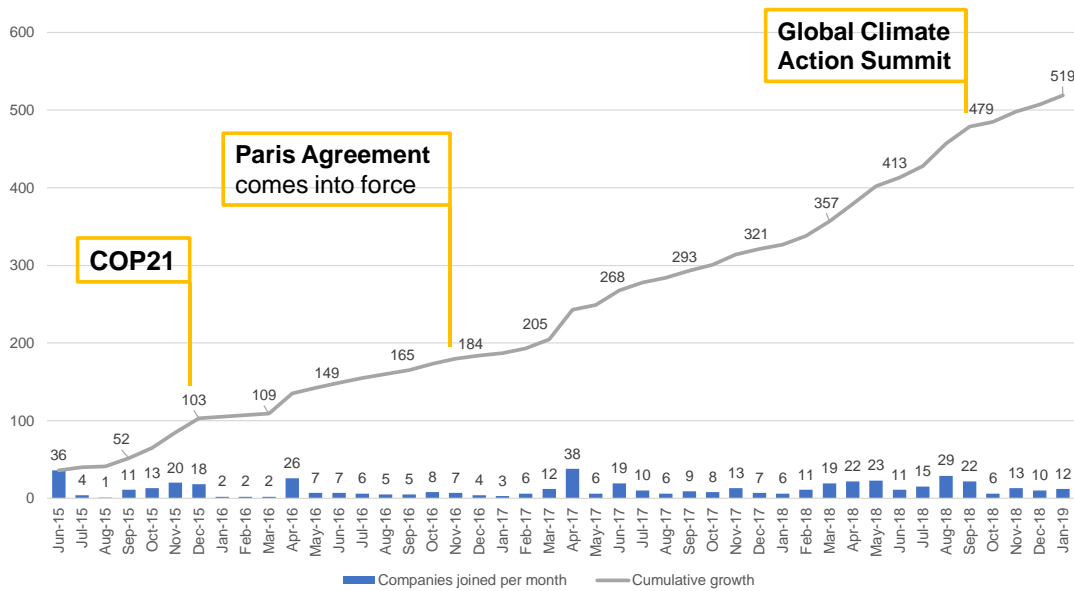


Accounted events have caused at least one fatality and/or produced normalised losses  $\geq$  US\$ 100k, 300k, 1m, or 3m (depending on the assigned World Bank income group of the affected country).

# Growth of Companies Setting Science-Based Targets



SBTi companies (committed and approved) since June 2015



555 companies have committed to setting SBTs – up from 320 companies in January 2018

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# Global ESG Investing: Steadily Rising



FIGURE 6: GLOBAL GROWTH OF SUSTAINABLE INVESTING STRATEGIES 2016–2018



Note: Asset values are expressed in billions.

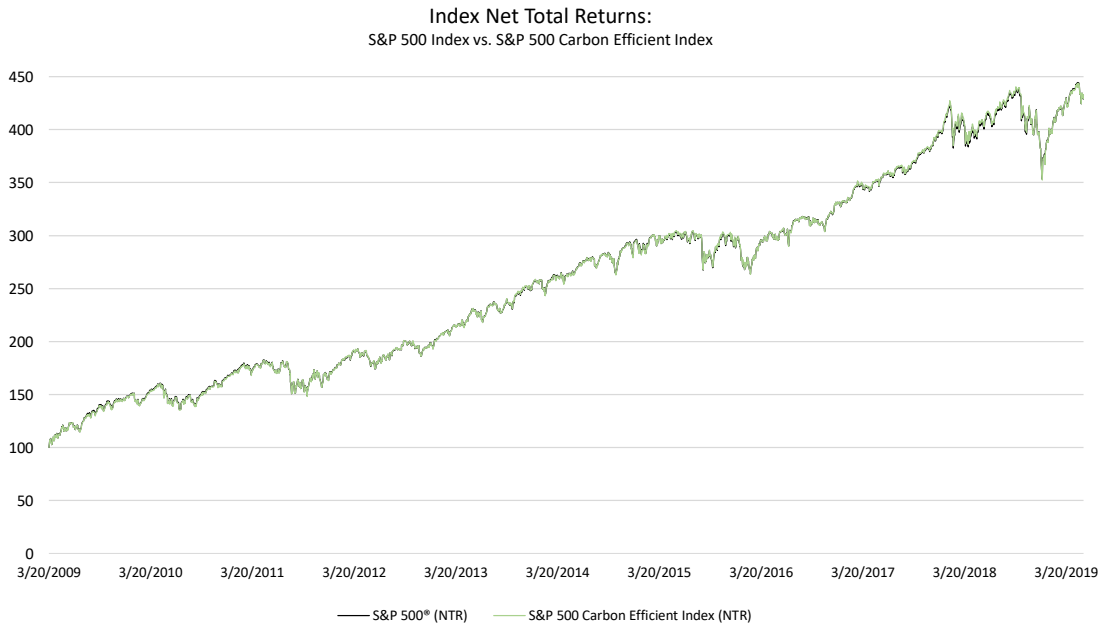
Some corrections to the 2016 strategies have been made. See the Methodology section for more information.

2018 GLOBAL SUSTAINABLE INVESTMENT REVIEW

# S&P 500 Index Closely Tracks S&P 500 Carbon Efficient Index



## S&P 500 Index vs. S&P 500 Carbon Efficient Index



**S&P Dow Jones  
Indices**  
A Division of S&P Global

NOTE: The graph shows the S&P 500 Index and S&P 500® Carbon Efficient Index (Net Total Return, daily performance) over a 10 year period. The index performance data was re-based as of the index series' base date (20/03/2009), and spans to 21/05/2019.

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