Client Conversations & Primers

Climate Change Investment Opportunities: Decarbonizing Your Portfolio

Climate Change Is Creating New Investment Opportunities

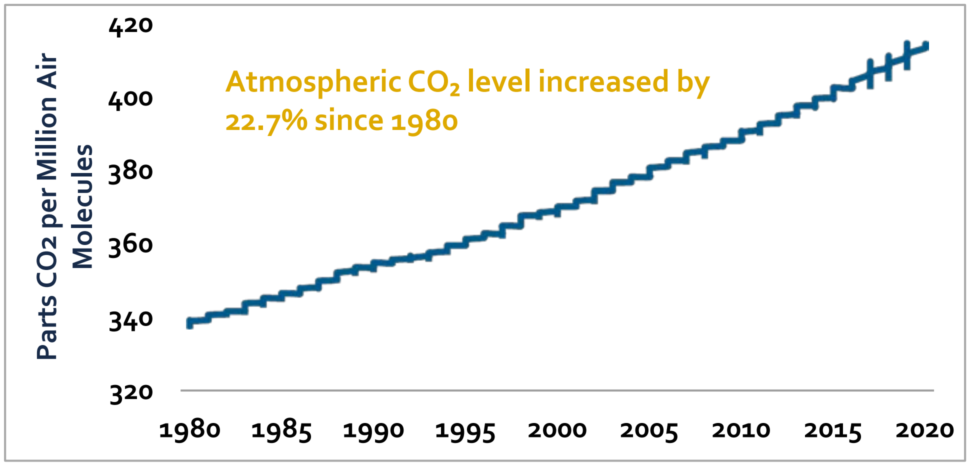
- Climate change represents perhaps the defining issue of our time. From rising sea levels that increase the risk of flooding, to extreme weather events, including droughts, floods and wildfires that threaten food and manufacturing supply chains, the impacts of climate change are global in scope and unprecedented in scale. Mitigating these risks and adapting to a changing environment due to climate change requires prompt and coordinated action across governments, corporates and investors.
- Current levels of greenhouse gas (GHG) emissions are projected to increase temperatures by 1.5⁰ C by 2040, driving a number of physical implications and attributed costs estimated at $54 trillion globally.* The Paris Agreement – signed by 187 countries – outlines key objectives to drive collective climate action: hold global temperature increases well below 2⁰ C above pre-industrial levels by 2100; adapt to adverse climate impacts and foster climate resilience; and increase capital flows toward low greenhouse gas emissions technology and climate-resilient development.
- To reduce global GHG emissions, companies are pledging to decarbonize, creating investment opportunities across all industries; this coincides with a globally diversifying energy mix as renewable energy proves to be cost competitive to conventional sources.
- **The Climate Change and Fossil Fuel Aware Investment Framework can help investors meet their long-term financial goals while helping with the transition to a lower-carbon economy.**

Source: *The Intergovernmental Panel on Climate Change 2019 Report: *Global Warming of 1.5⁰*

It Has Become Well Understood that Human-Induced Greenhouse Gas Emissions (GHG) Are the Primary Cause of Climate Change

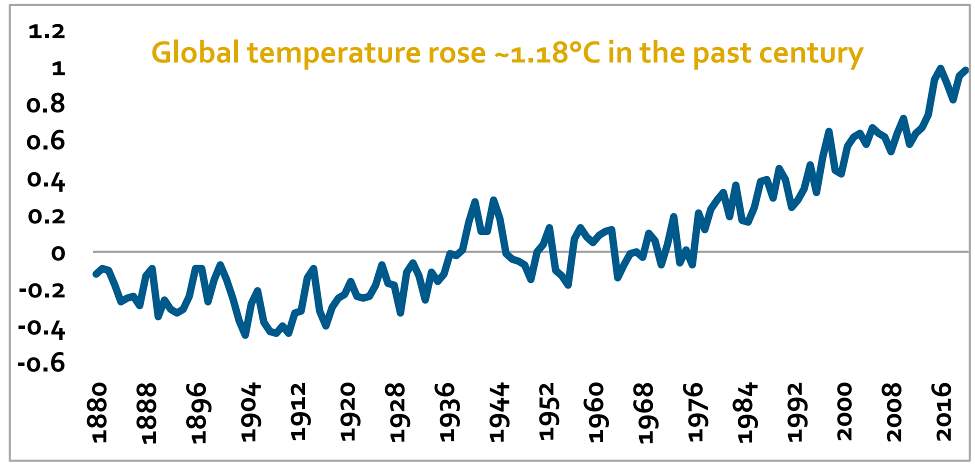
Atmospheric CO_2 Level (ppm)

As of February 2020



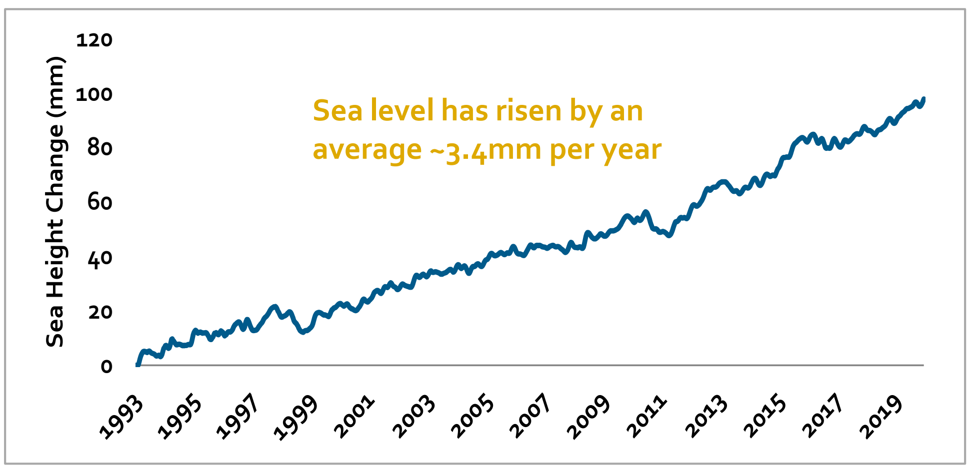
Global Land-Ocean Temperature Anomaly – Annual Mean (°C)

As of December 2020



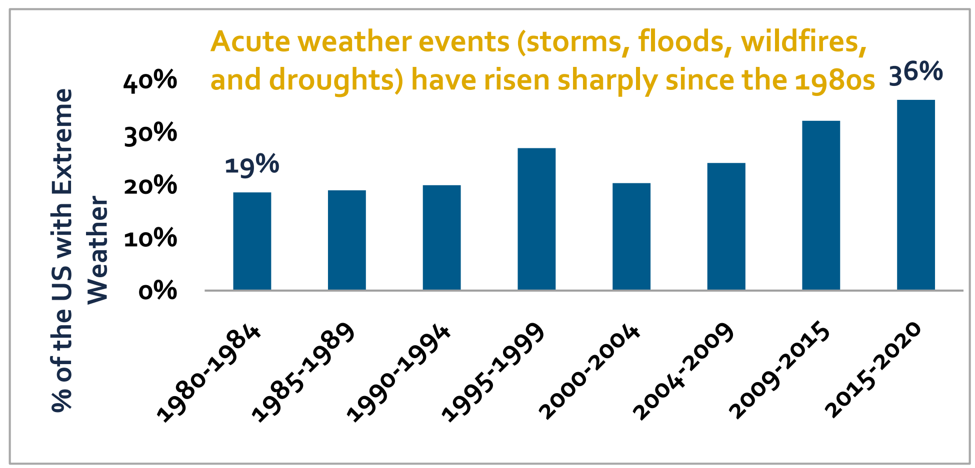
Sea Level Change Since 1993 (satellite data)

As of December 2019



Five-Year Average US Climate Extremes Index (CEI)

As of December 2020



Source: National Oceanic and Atmospheric Administration, NASA's Goddard Institute for Space Studies, NASA Goddard Space Flight Center, The National Center for Environmental Information, Morgan Stanley Wealth Management Global Investment Office Sustainable Impact Strategy

Climate Change Is an Economic Reality and a Growing Risk That Investors, Businesses and Governments Are Learning to Address

PHYSICAL RISKS

Environmental
- Destruction of natural resources
- Acute weather events (storms, floods, wildfires, and droughts)
- Environmental pollution or contamination
- Increase in rainfall variability and depletion of water
- Increased uncertainty for crop yields across regions
- Rising fertilizer costs

Social
- Forced migration
- Geo-political impacts
- Implications for human health
- Reduced access to public goods
- Shortages in food supply
- Societal change

TRANSITION RISKS

Regulatory and Legal
- Increase in climate-specific legislation
- Regulation and policies including:
  - Physical risk disclosure requirements
  - Increasing exposure to legal liability

Technological
- Market disruption from new technologies

BUSINESS REPERCUSSIONS

Business
- Reduced access to capital
- Increase in costs and high capex requirements
- Intangible assets (brand, reputation, license to operate)
- Lost revenues
- Potential liabilities
- Project risks in project-based assets
- Sensitivity to fossil fuel prices
- Supply chain, logistics, production and operations
- Tangible asset destruction

CONSEQUENCES ON THE FINANCIAL SYSTEM

Economic
- Fiscal policy
- Global demand and commodity price exposure
- Global GDP
- Government policy
- Inflation
- Labor productivity
- Market demand/supply
- Political interference

Investments
- Costs of carbon emissions
- Devaluing fossil fuel investments
- Lack of exposure to emerging opportunities
- Stranded assets

Source: Morgan Stanley & Co. International, *Decarbonisation: The Race to Net Zero* (October 21, 2019)

Despite Existing Policies and Emission Reduction Pledges, There Is Potential for Even Further Regulation Across the Globe

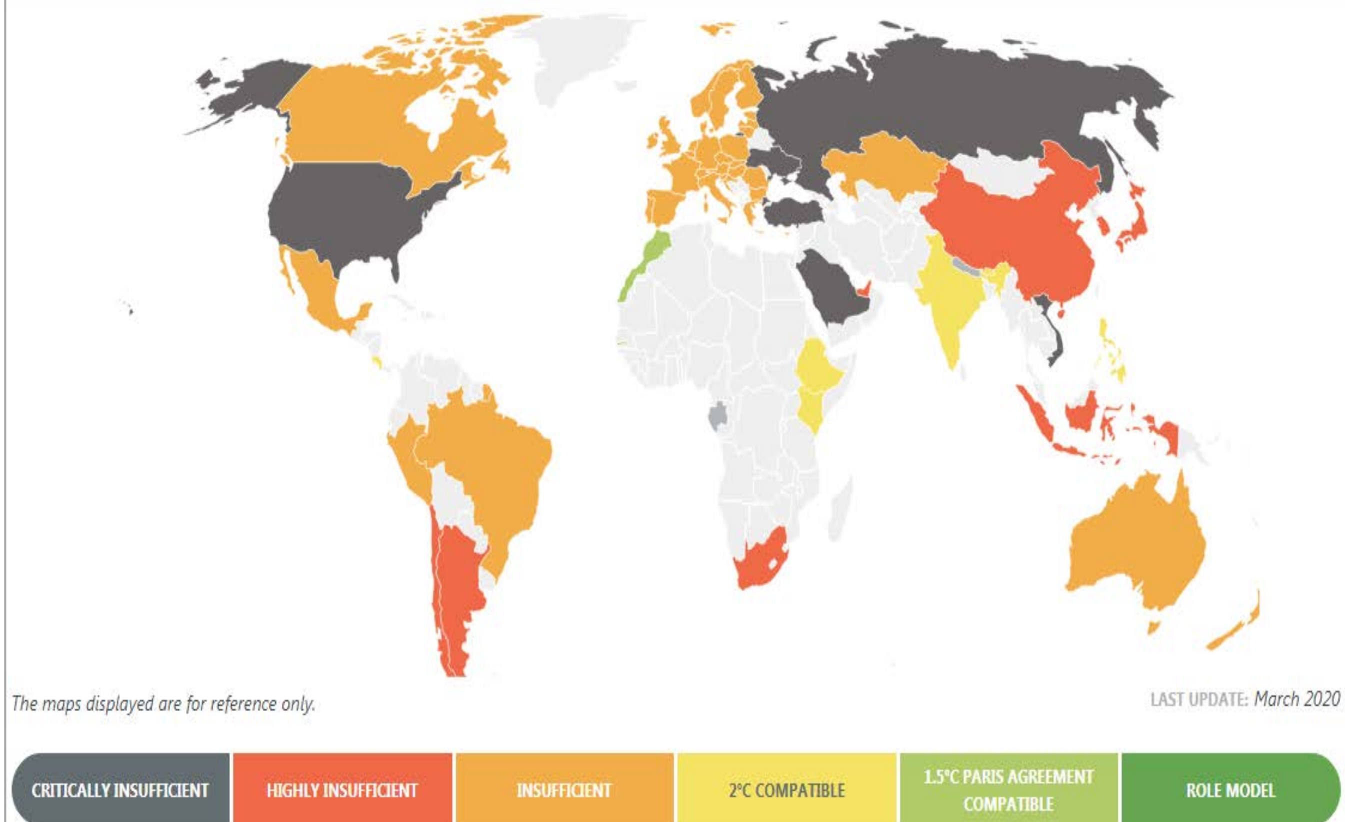
Upcoming Climate Regulation Pledges

As of July 31, 2017

UNFCCC Party	2012 % of World GHG Emissions	GHG Reduction Goal
China	22.4	60%
United States*	12.2	26%
EU (28)	8.7	40%
Russia	4.7	25%
Japan	2.5	26%
Canada	1.8	30%
Mexico	1.6	25%
Australia	1.4	26%
South Korea	1.4	37%
Ethiopia	0.3	64%
Morocco	0.2	32%
Kenya	0.1	30%
New Zealand	0.1	30%
Singapore	0.1	36%
Switzerland	0.1	50%
Trinidad & Tobago	0.1	30%
Norway	0.1	40%

Climate Action Tracker Rating of INDC Submissions by Country

As of March 2020

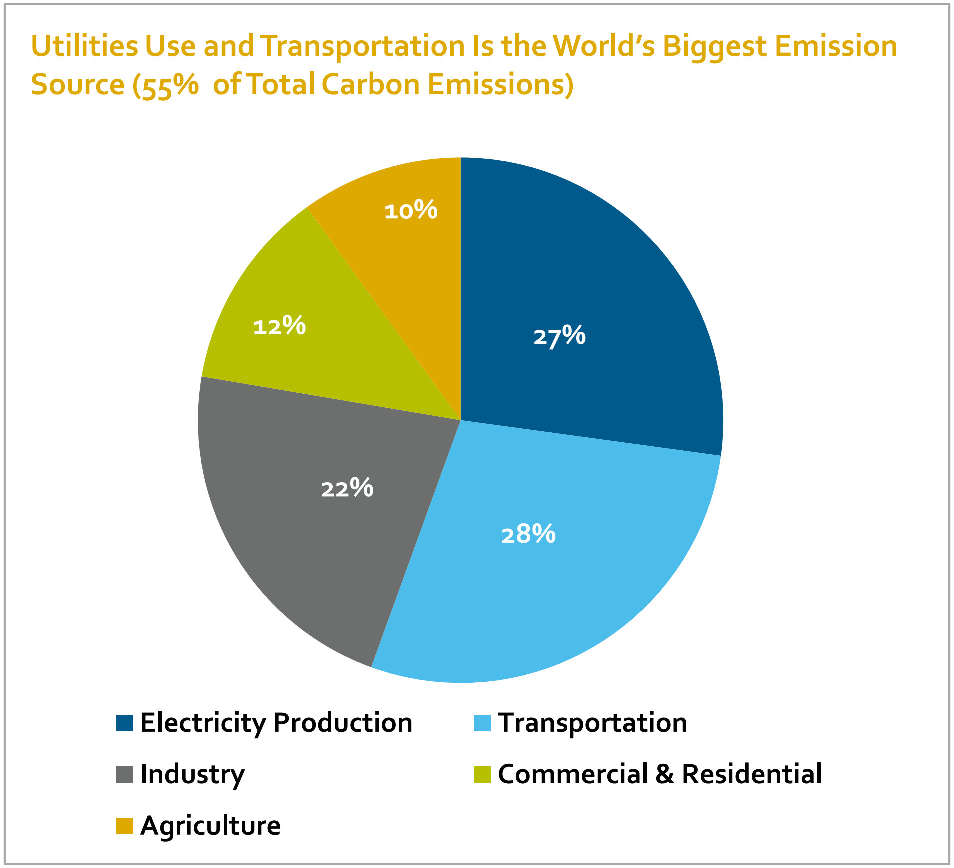


Source: Climate Action Tracker, Copyright © 2009 by Ecofys and Climate Analytics

Utilities and Transport Are Major Sources of Greenhouse Gas (GHG) Emissions With Increased Emissions by EM

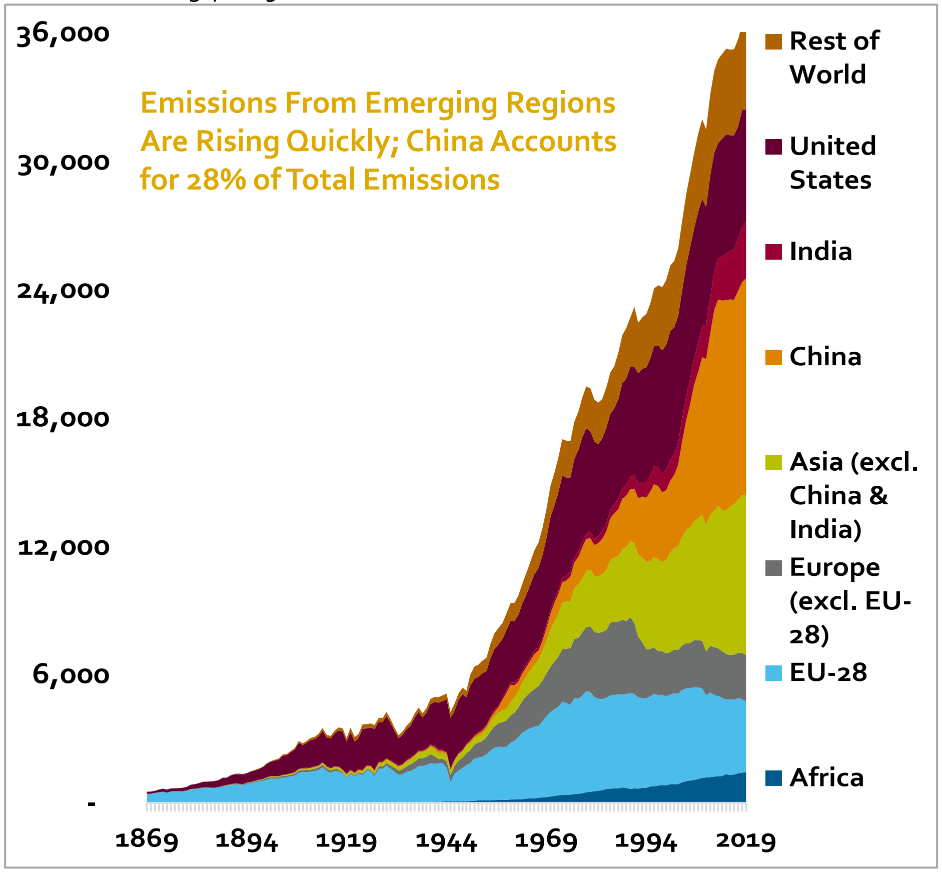
World CO2 Emissions by End Use Sector

As of December 31, 2018



Percent of CO_2 Emissions by Region

As of December 31, 2019



Source: IEA, Morgan Stanley Wealth Management Global Investment Office Sustainable Impact Strategy. *Other includes agriculture/forestry, fishing, energy industries other than electricity and heat generation, and other emissions not specified elsewhere.

To Reduce GHG Emissions, Companies Are Pledging to Decarbonize, Creating Investment Opportunities Across All Industries

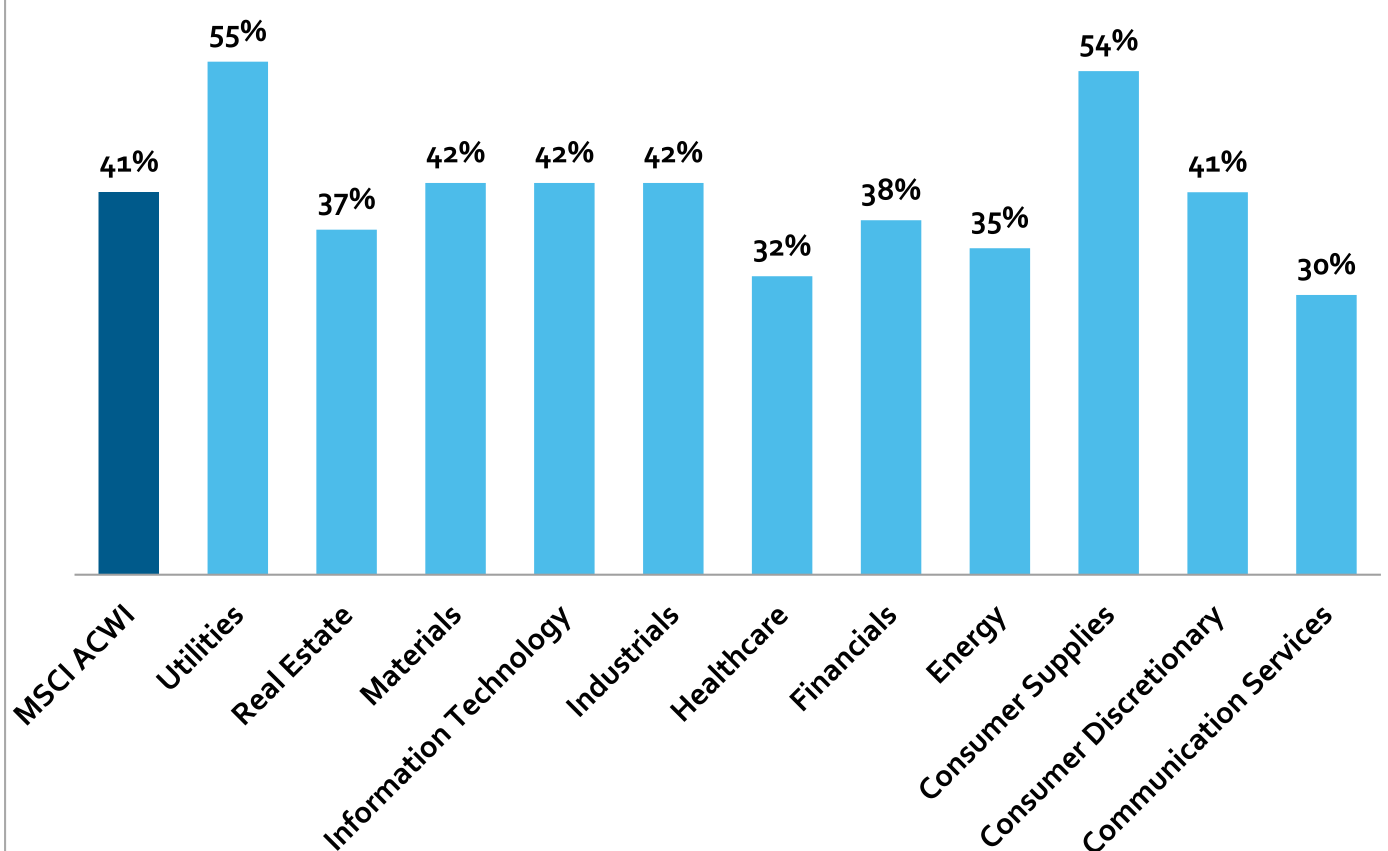
4 in 10 global companies across multiple sectors have a confirmed emissions target:

Akin to earnings guidance, companies have begun to set public targets for reducing their emissions

- As a baseline, emissions targets, coupled with evidence of action toward achieving said targets, can signal a positive direction toward decarbonization efforts
- As companies set, refine and make progress toward these goals, their related decarbonization investments may translate into valuation over time (particularly in high-emitting sectors)

Percentage of Companies With Confirmed Emissions Targets

MSCI ACWI Universe as of 12/31/2019



Source: Morgan Stanley Institute for Sustainable Investing, Morgan Stanley Investment Management: *Climate Transition in a Portfolio Context* (July 1, 2020)

Five Technologies Offer Innovative Solutions to Decarbonize Industry, Power and Mobility

RENEWABLES

- **Renewable power is the cornerstone of de-carbonization**
- **Renewables** will account for 37% of global capacity (2019E) compared to 25% in 2000
- **Solar** is positioned to become the fastest-growing technology, with capacity increasing at a 13% CAGR (MS & Co. est.)
- Strong outlook for **wind**, which remains the lowest-cost form of energy in many markets
- **Hydropower** will continue to play an important role in achieving climate goals

ELECTRIC VEHICLES (EV)

- **Concerns around air pollution and climate change have helped accelerate investment**
- 113 million EVs are expected to hit the road by 2030 globally; 924 million by 2050
- $11 trillion of capital expenditures required to support EVs throughout the next 30 years
- Cost reduction in EV battery cells is key for volume production and higher penetration; cost parity of $100/kWh could be achievable by around 2025

HYDROGEN

- **Clean hydrogen offers a material opportunity to reduce carbon emissions in industry**
- The Hydrogen Council expects 18% of final energy demand attributed to hydrogen by 2050; 10x increase in demand
- Opportunity for the creation of an industry with $2.5 trillion of revenues globally
- Green hydrogen requires renewable energy to power the process of water electrolysis
- To reach the 2050 target, ~$5.4 trillion would need to be invested in electrolysers

CARBON CAPTURE AND STORAGE (CCS)

- **IEA targets the capture of 850 million tons of carbon per year (MTPA) in 2030**
- $2.5 trillion of upfront capital investment by 2050 is needed to build sufficient capacity
- 380 new, large-scale CCS facilities would need to be operational by 2030 to reach the IEA goals
- To make CCS attractive to investors, IEA suggests providing incentives for emission reductions
- 15% reduction in cost of building CCS plants expected by2040; 30% by 2050

BIOFUELS

- **The integration of biofuels in the transportation fuel mix is key to achieving carbon emission reduction goals**
- Biofuels provide a low carbon solution for the continued use of the combustion engine
- By 2030, ~4% of global transportation fuels will come from biofuels
- $2.7 trillion capex is needed by 2050 to reduce emissions by 1.7Gt
- Aviation will become a key use for this clean fuel as EVs become the main form of passenger car transport

Source: International Energy Agency (IEA), Morgan Stanley & Co. International, *Decarbonisation: The Race to Net Zero* (October 21, 2019)

These Technologies Introduce a Broad Array of Investment Opportunities; $50 Trillion Needed Across 5 New Technologies

	% of Global Emissions	Renewables	Electric Vehicles (EVs)	Hydrogen	Carbon Capture & Storage (CCS)	Biofuels
Power	26%	✓		✓	✓	
Transport	15%	✓	✓	✓		✓
Industry	12%	✓		✓	✓	
Buildings	6%	✓		✓		

✓ Relevant Applications

Short Term (1-3 years)

- Battery manufacturers
- Biofuels for autos
- Enhanced oil refiners (EOR)
- Power generation (hydro, solar, wind)

Medium Term (3-7 years)

- Lithium & cobalt
- Power storage
- Power grid enhancements
- Original equipment manufacturers (OEMs)
- Semiconductors

Long Term (7+ years)

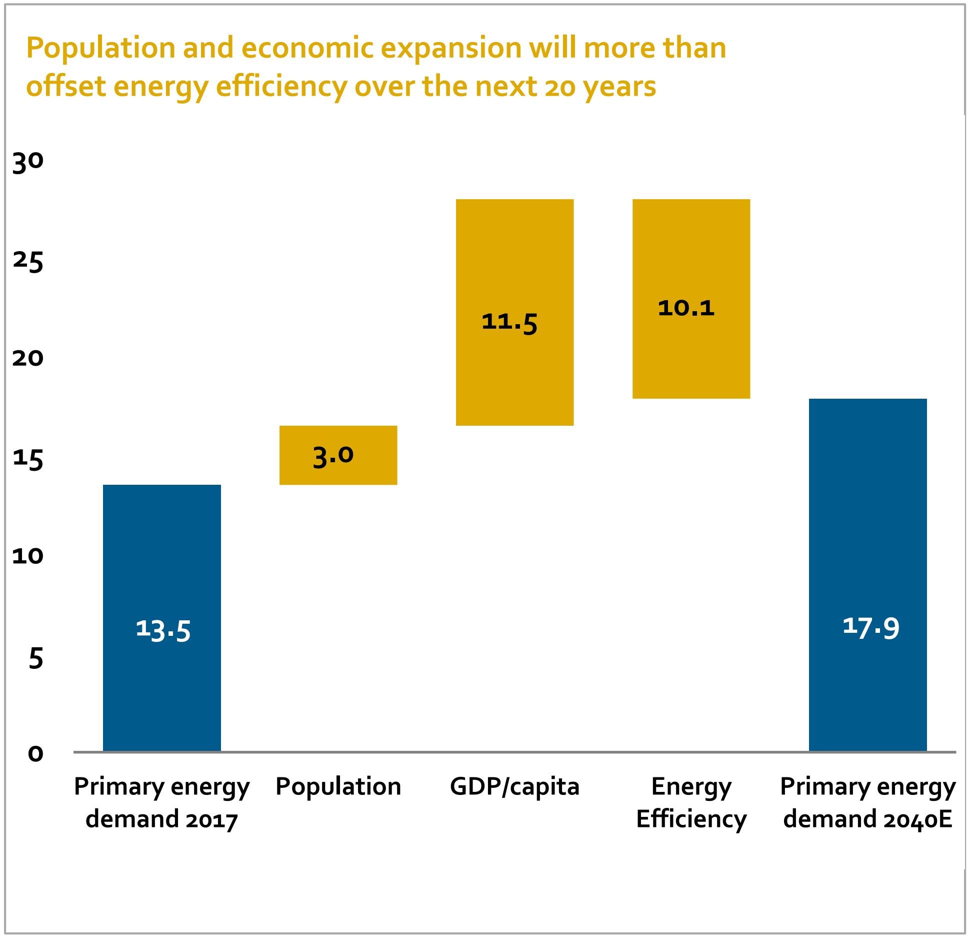
- Biofuels for aviation & trucks
- Electrolyser manufacturing
- Fuel cell manufacturers
- Industrial gases (hydrogen)
- Industrial gases (CCS)
- Renewables for EVs
- Renewable power (hydrogen)

Source: Morgan Stanley & Co. International, *Decarbonisation: The Race to Net Zero* (October 21, 2019)

Renewables Are Becoming Increasingly Cost Effective, Leading to More Power Generation

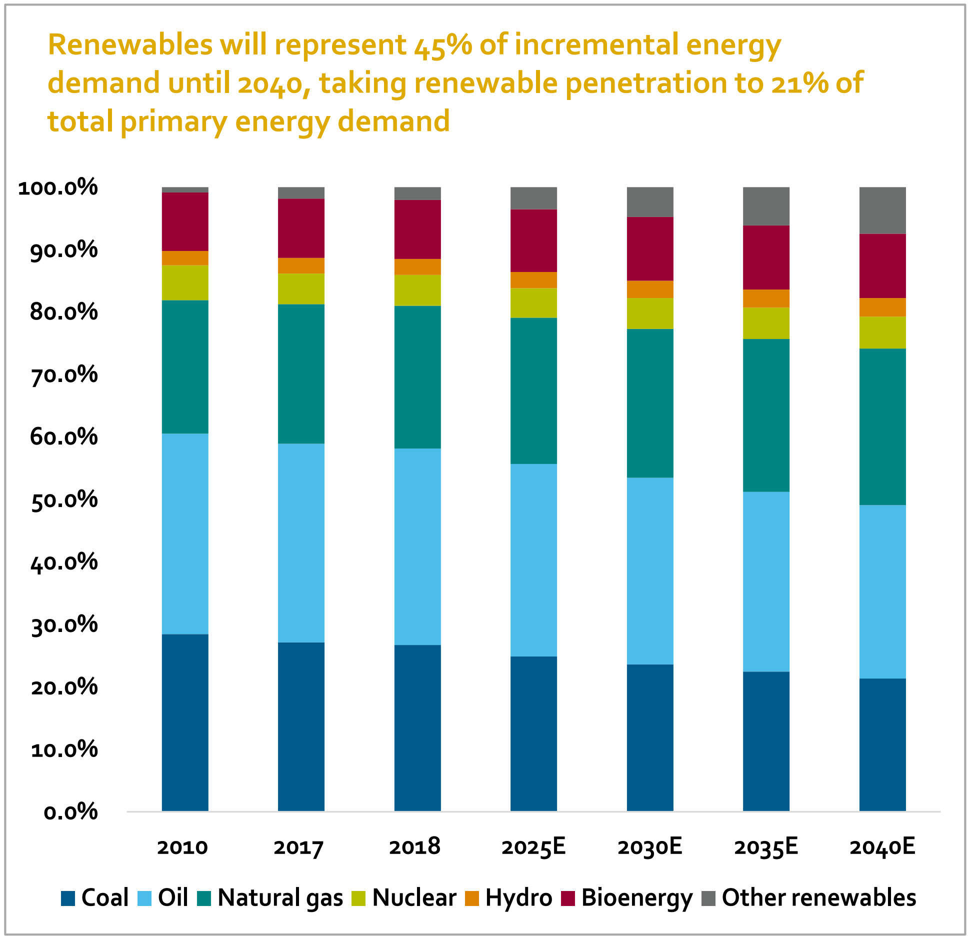
Primary Energy Demand 2017-2040E (billion toe)

As of October 31, 2019



% of Total Primary Energy Demand

As of October 31, 2019

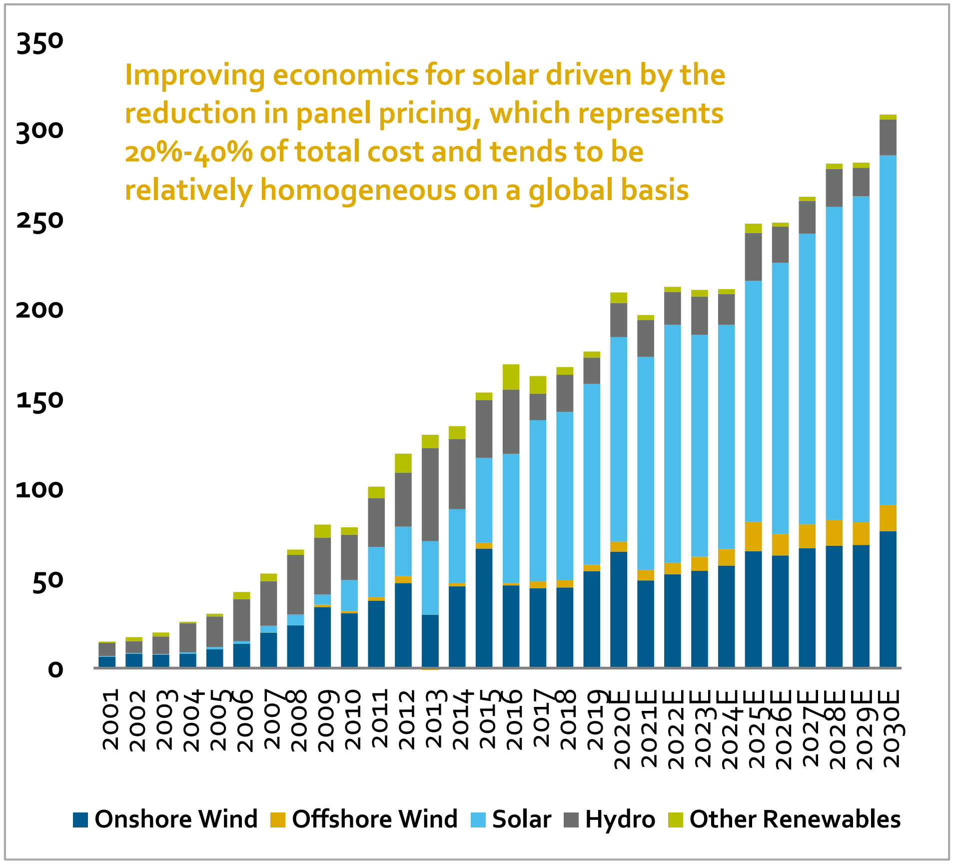


Source: BP World Energy Outlook 2019, Morgan Stanley Institute for Sustainable Investing analysis based on International Energy Agency's World Energy Outlook 2019

Solar Will Surpass Wind and Hydro to Become the Largest Source of New Capacity Over the Coming Decade

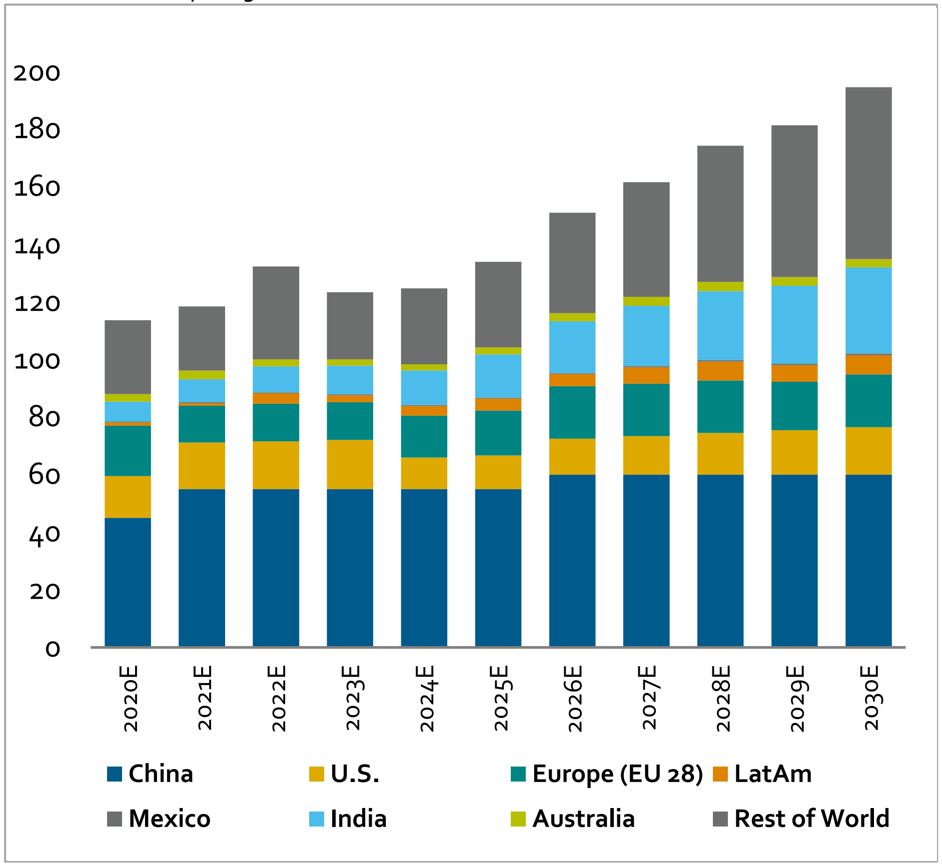
Renewable additions (GW)

As of October 21, 2019



Growth in solar power capacity 2020E-2030E – Additions (GW)

As of October 21, 2019



Rapidly improving economics in solar will drive a 13% CAGR for additional capacity, making it the fastest-growing technology

Source: Morgan Stanley & Co. International, *Decarbonisation: The Race to Net Zero* (October 21, 2019)

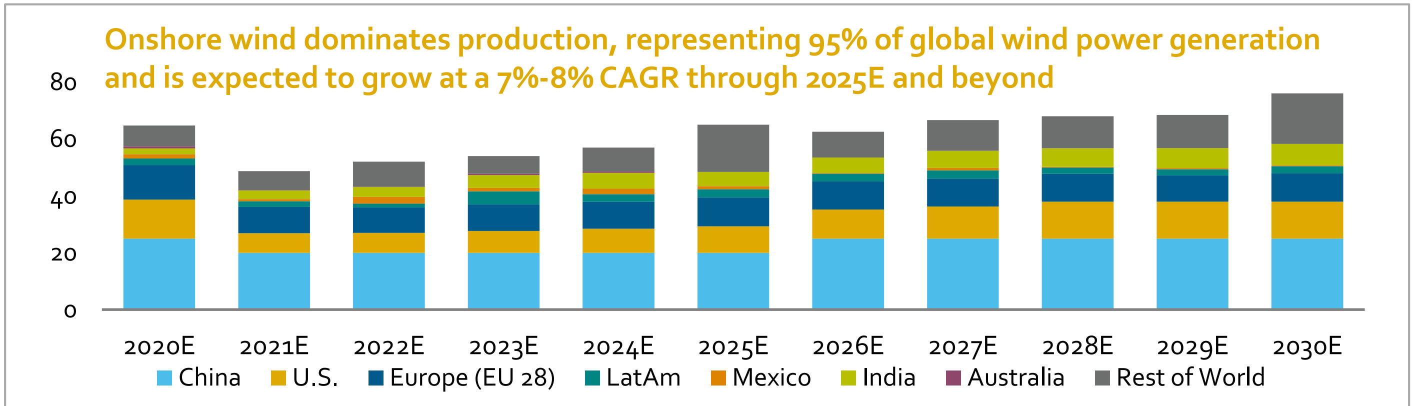
Strong Growth Outlook for Wind, Driven by Increased Capacity Demand and Compelling Economics

Commercial and Industrial customers are becoming a very important source of incremental wind demand:

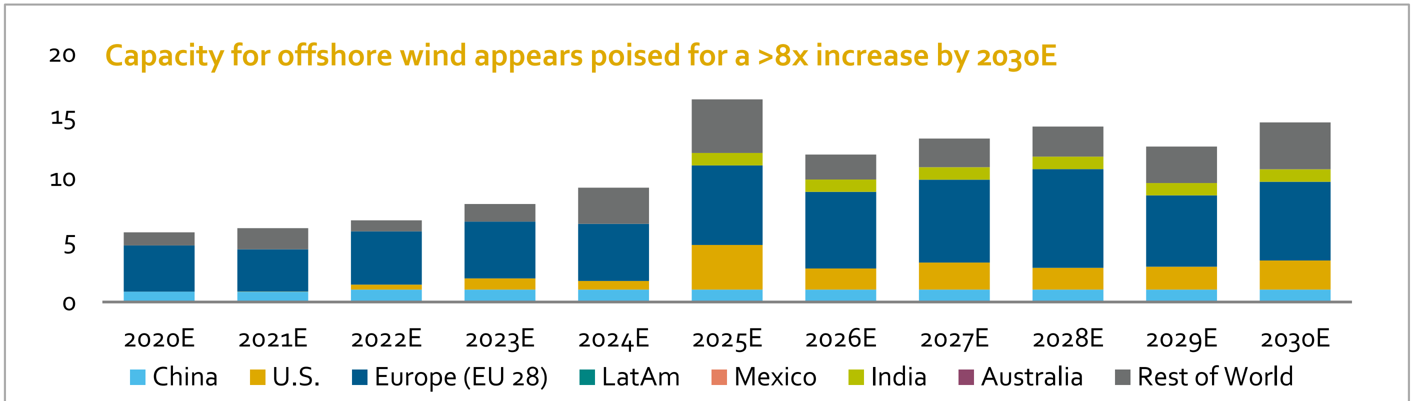
- Commercial and Industrial customers in the US are a key source of growth, signing a record 4,203 MW of wind in 2018
- 36% more wind power on its way with 35GW in the near-term pipeline
- 2018 saw the highest level of annual power purchase agreement activity on record to date, adding 8,547MW

Onshore Wind Additions (GW)

As of September, 2019



Offshore Wind Additions (GW)

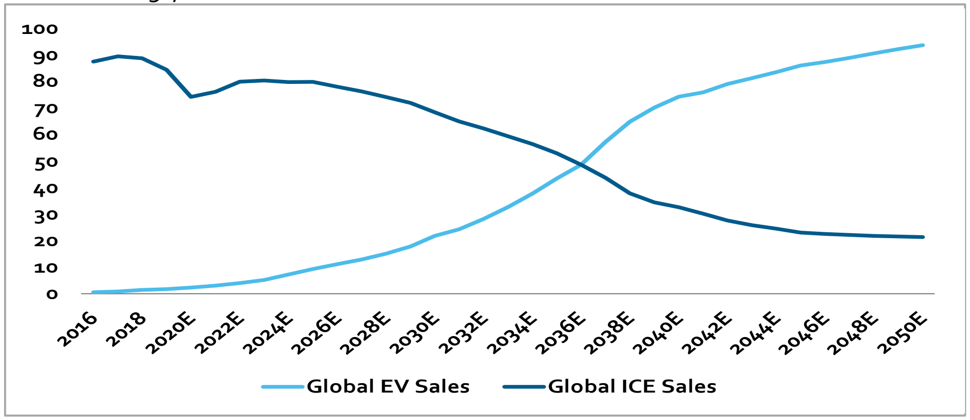


Source: Morgan Stanley & Co. International, *Decarbonisation: The Race to Net Zero* (October 21, 2019), American Wind Energy Association (AWEA)

Increasingly Strict Regulation and New Products Are Driving Electric Vehicle (EV) Penetration

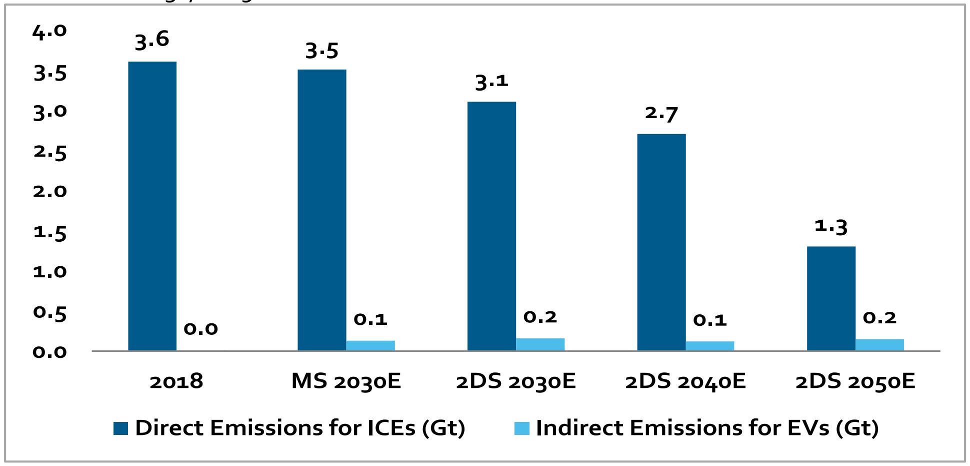
Number of Vehicle Sales (in millions)

As of March 31, 2020



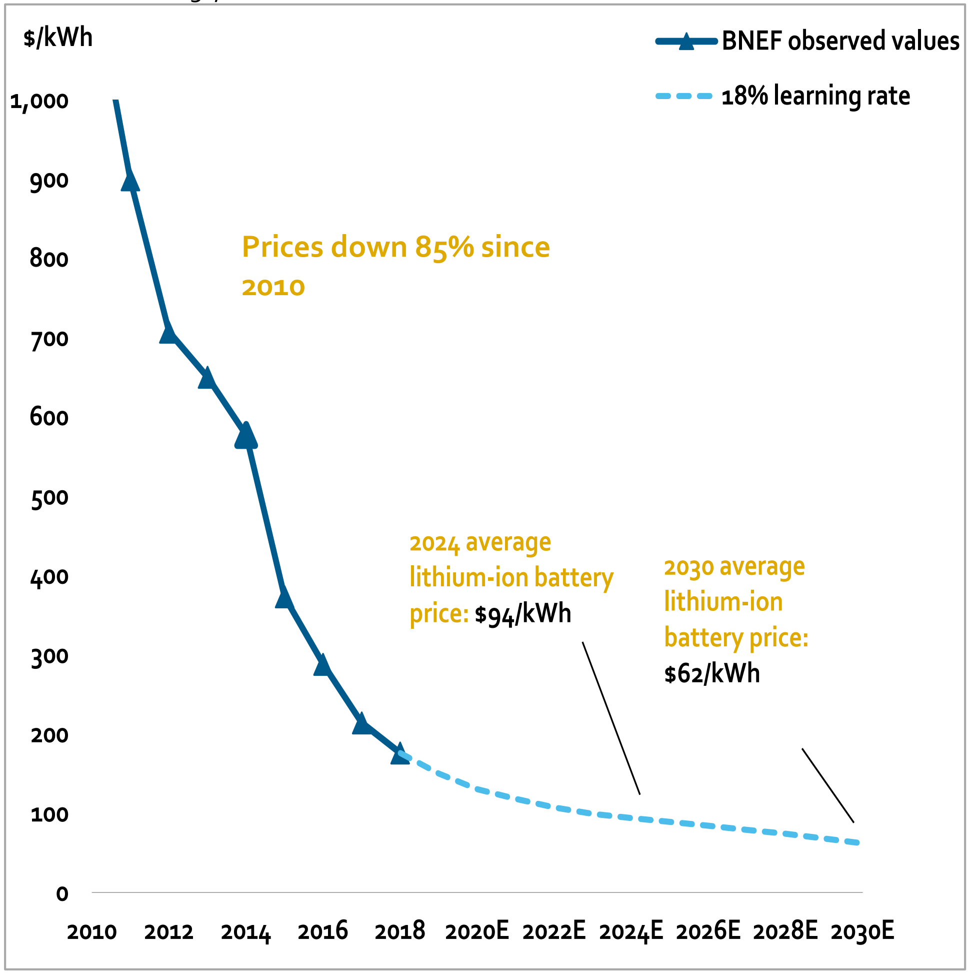
ICE Cars' Emissions Will Decrease as EVs Replace Them

As of October 31, 2019



Lithium-ion Battery Prices are Declining, Making EV More Affordable

As of December 31, 2018



Source: Bloomberg New Energy Finance ("BNEF"), Morgan Stanley & Co. Research, Morgan Stanley Wealth Management Global Investment Office Sustainable Impact Strategy

Hydrogen Will Become a Key Enabler of Decarbonization Across Industry, Mobility and Power Generation Beyond 2030

Green hydrogen requires the use of renewable energy to power the process of water electrolysis:

- Water electrolysis is the decomposition of water molecules (H_2O) into oxygen (O_2) and hydrogen gas (H_2) as an electric current is passed through water
- Water electrolysis is a chemical process run by electrolysers. Between 2010-18, 80 MWe of electrolyser capacity has been installed globally, but that is expected to grow significantly, to as much as 15,000 MW by 2030

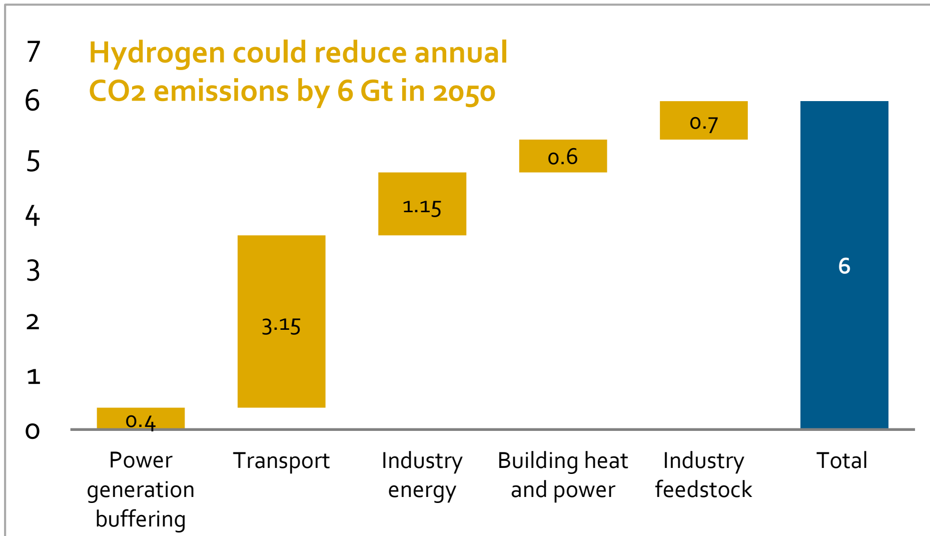
Demand for green hydrogen is growing, and economics are improving over time:

- Green hydrogen costs will fall by up to 64% by 2040, although cost trajectories are uneven
- Global demand for hydrogen has grown by 28% over the past decade, peaking in 2020 at 111.7 million metric tons or 320Mtoe
- The top 10 countries account for 70% of global hydrogen demand. China and the United States each account for 21% and 19% of demand, respectively
- The Hydrogen Council estimates $280 billion of investment in green hydrogen is needed by 2030 to be on track for 2DS

Contributions of clean hydrogen to decarbonization:

- **Industry:** to reduce emissions on existing industrial processes (chemicals, energy, mining, food producers)
- **Mobility:** from light vehicles to buses, trucks and ships
- **Utilities:** green hydrogen can help manage electricity grid stability with increasing participation of renewables, and be used for heating and cooling

CO_2 Avoidance Potential 2050E, Gt



Source: Morgan Stanley & Co. International, *Decarbonisation: The Race to Net Zero* (October 21, 2019)

Investments in Electricity Storage Are Vital to Support the Increase in Renewable Power Penetration

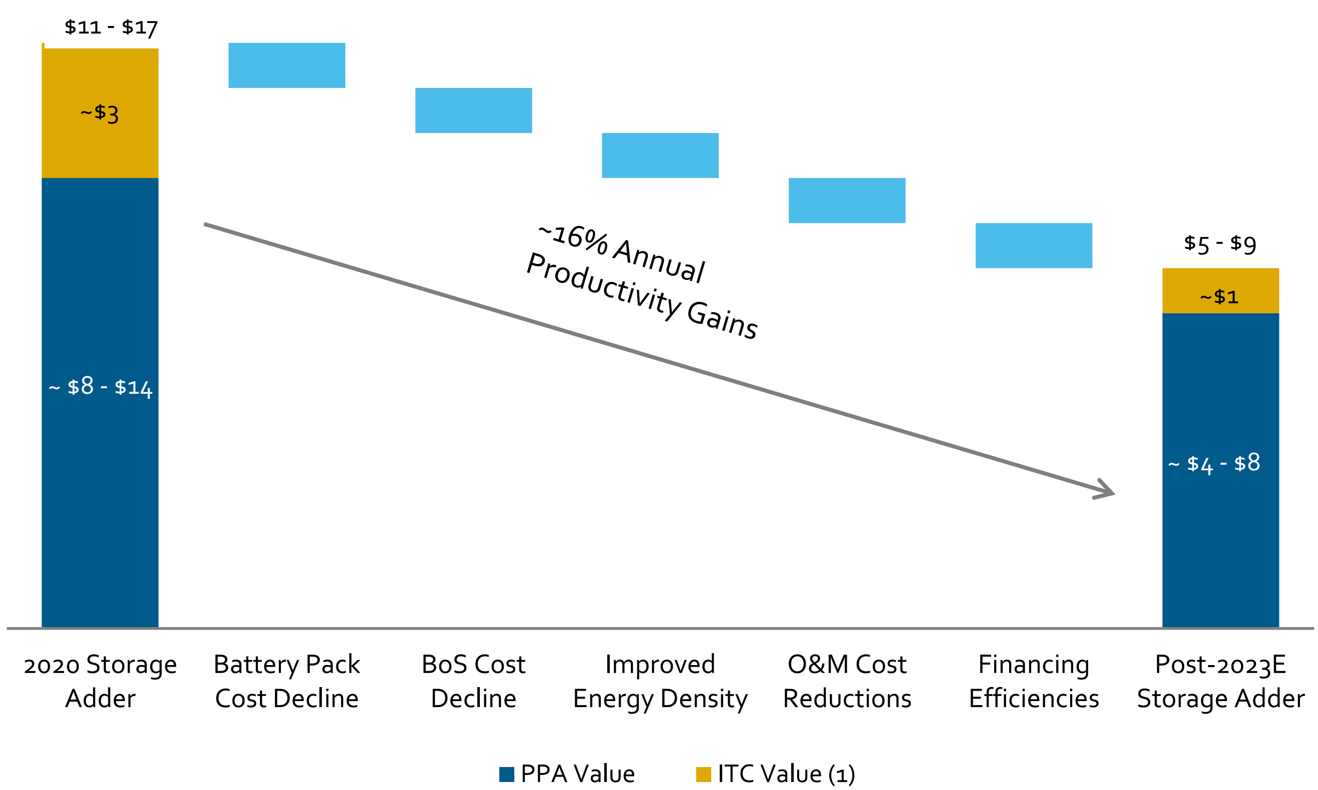
Benefits of storage

- Potential to lower power pricing and increased efficiency of existing grid resources; costs of storage are expected to halve by 2030
- Improving predictability and grid stability; storing excess solar and wind power produced during low-demand periods and releasing it during peak-demand periods
- Act as a 'shock absorber' to counteract unpredictability of potential solar and wind power output

Storage Adder Roadmap

As of September, 2019

Storage costs expected to decline more rapidly than solar and wind over the next 5 years, possibly making renewables the dominant source of new power generation in India and China



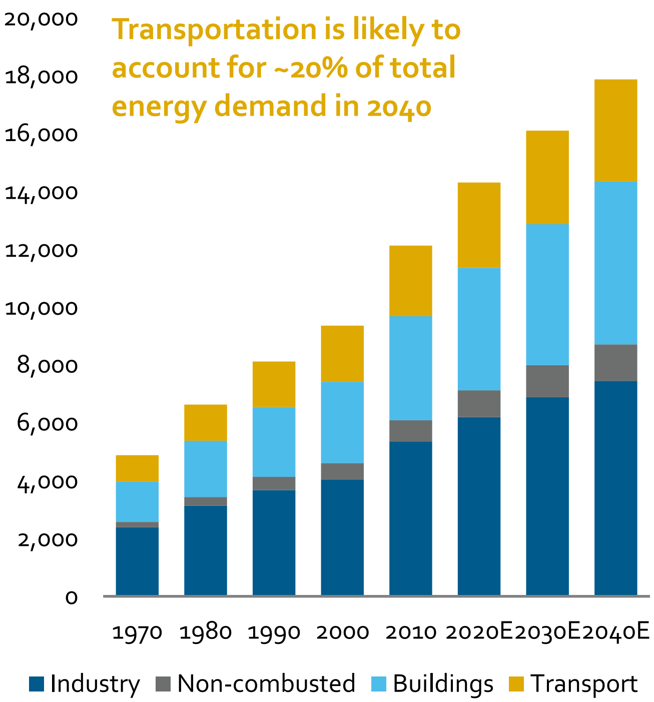
Source: Morgan Stanley & Co. International, *Decarbonisation: The Race to Net Zero* (October 21, 2019). Note: Figures are based on NextEra Energy Resources' estimate; assumes 25% of facility's generating capacity for a 4-hour duration. (1) Pre-tax value of investment tax credit levelized over the life of the project.

Integrating Biofuels Into the Transportation Fuel Mix Can Help Lower the Carbon Footprint of the Transportation Sector

Biofuels are used predominantly in road transportation, but are the primary solution for the decarbonization of the aviation industry

Primary energy demand – end use sector

As of 2019



Types of Biofuels

First Generation

- Produced naturally occurring vegetable oils such as starch, corn, sugarcane, soy beans, and canola
- Ethanol represents nearly 80% of the total biofuel market globally
- Production has high impacts on land and water usage, and potentially on the food supply

Second Generation

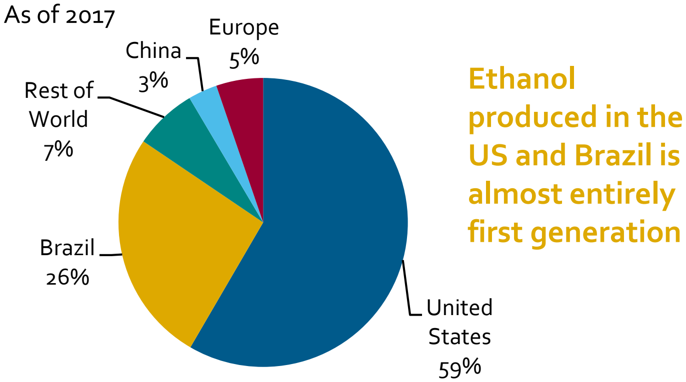
- Produced using non-food feedstock such as waste, wood, animals fats, grasses and inedible parts of plants
- The 2018 World Energy Outlook claims good availability of required feedstock supply

Third Generation

- Derived from algae; has the ability to produce much higher yields using fewer resource inputs
- Market is still in its infancy

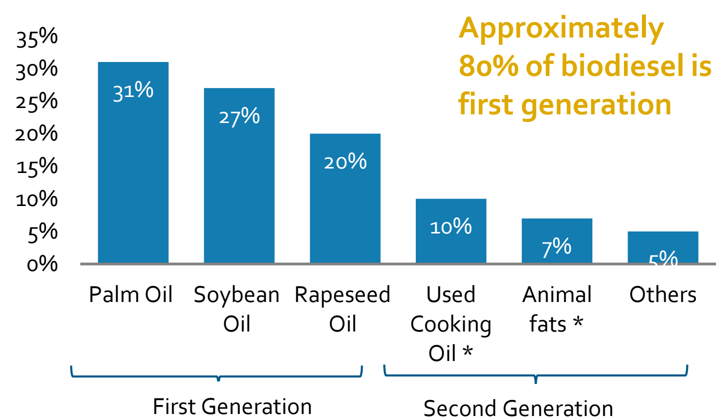
World Fuel Ethanol Production

As of 2017



Biodiesel is mainly made from vegetable oils

As of 2016

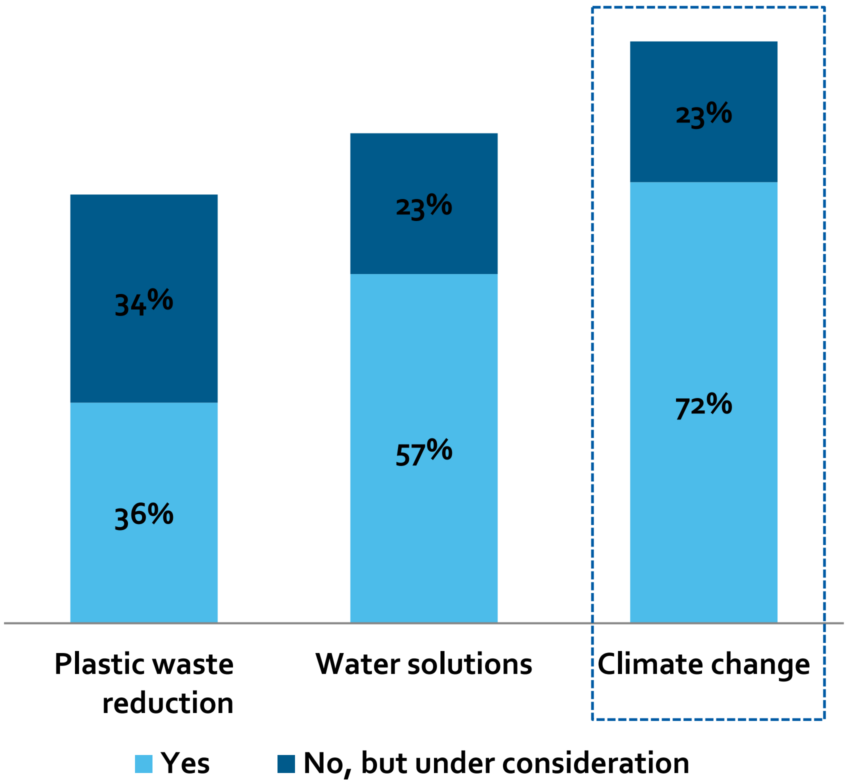


Source: Morgan Stanley & Co. International, *Decarbonisation: The Race to Net Zero* (October 21, 2019), Oil World, Morgan Stanley & Co. Research. *Considered first generation in Europe.

With Heightened Focus on Climate Change, Integrating Climate Solutions Has Become a Key Area of Interest for Investors

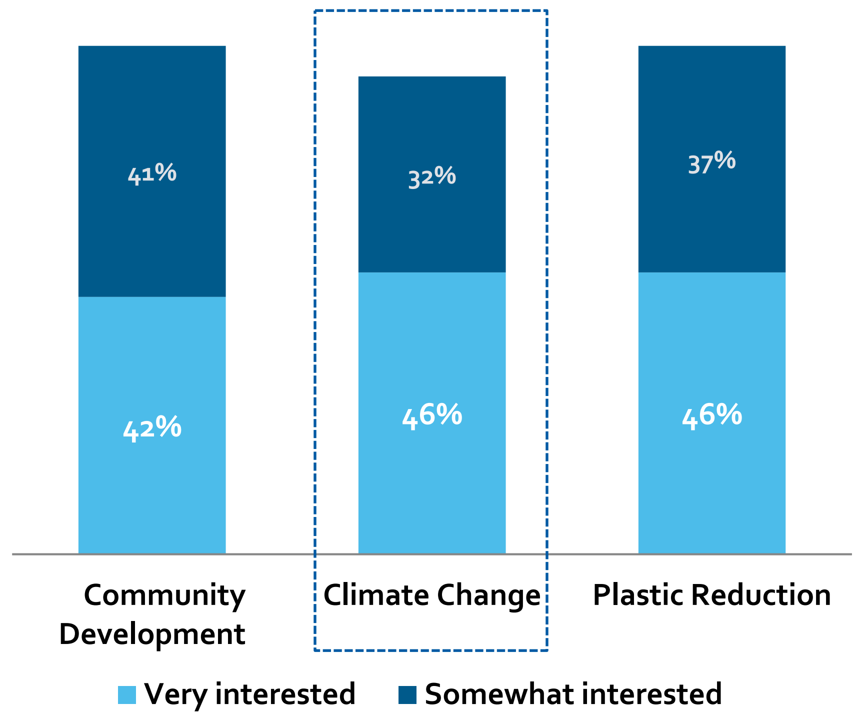
Climate Change Is a Leading Investment Theme for Global Asset Owners

Does your organization's thematic investments seek to address any of the following sustainability issues?



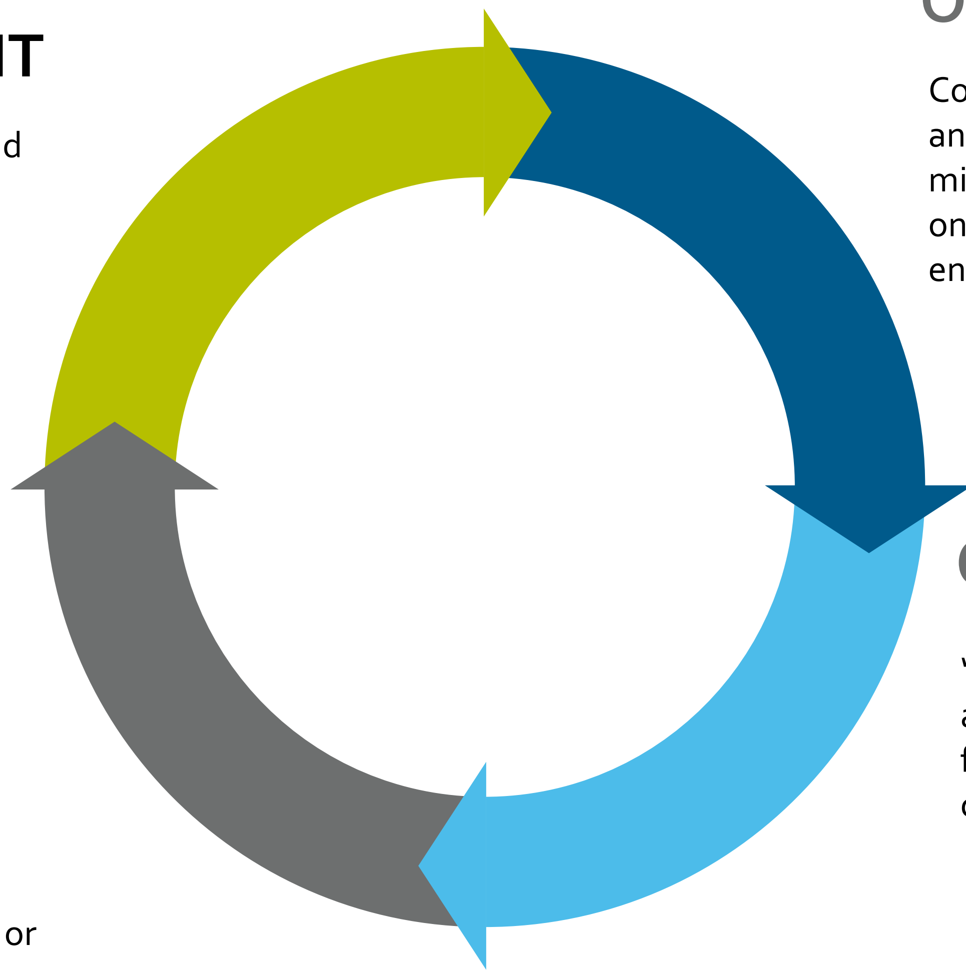
Climate Change Is Among the Top Three Sustainability Issues for Individual Investors

How interested would you be in including each theme in your investment portfolio, assuming each investment would achieve similar market-rate financial returns?



Source: Morgan Stanley Institute for Sustainable Investing, Sustainable Signals: *Asset Owners See Sustainability as Core to the Future of Investing* (May 27, 2020)

Developing a Climate-Aware Investment Strategy



01 DEFINE

Consider sustainability objectives and develop a climate-aware mission statement to foster ongoing stakeholder engagement

02 ASSESS

"Know what you own" – assess and track exposure to fossil fuels and companies with large carbon reserves

03 EVALUATE

Evaluate the feasibility of a personalized solution – understand client-specific needs such as exposure to comingled or illiquid assets, or unique tax requirements

04 IMPLEMENT

Integrate climate change and fossil fuel aware objectives with financial objectives through an investment plan or policy statement

Source: Morgan Stanley Wealth Management Global Investment Office Sustainable Impact Strategy

Climate Change and Fossil Fuel-Aware Investing Framework

REDUCE EXPOSURE → ACTIVATE ENGAGEMENT

	Fossil-fuel aware	Environmental leaders	Climate solutions	Shareholder Engagement
DEFINITION	Eliminate or reduce exposure to companies producing coal, oil and nuclear energy or owning significant fossil fuel reserves	Exposure to all sectors and industry groups, including energy, but only in companies that reflect the best environmental practices relative to industry peers	Focus on investable themes that seek to improve climate change mitigation and/or adaptation solutions	Drive positive environmental change through active dialogue with invested companies
MSIQ KEY OBJECTIVES	• Carbon Underground 200 • Industry Sector	• Climate Disclosure: Carbon Emissions Reporting • Climate Footprint: Reducing Carbon Emissions	• Climate Solutions Revenues • Industry Sector	• Climate Disclosure: Carbon Emissions Reporting • Climate Footprint: Reducing Carbon Emissions
ASSET CLASSES	• Public equity • Public fixed income • Alternative investments	• Public equity • Public fixed income • Alternative investments	• Public equity • Public fixed income • Alternative investments	• Public equity
EXAMPLES	Actively managed MF, SMA or ETF with restricted exposure to companies with the largest fossil fuel reserves	SMA that integrates ESG criteria, such as water efficiency and carbon footprint while maintaining exposure to all sectors, including energy	Active or passive strategies with a focus or tilt on investing in companies in the environmental solutions-oriented subsector	Active MF or SMA exercising proxy voting and filing shareholder resolutions around key climate- and fossil fuel-related issues

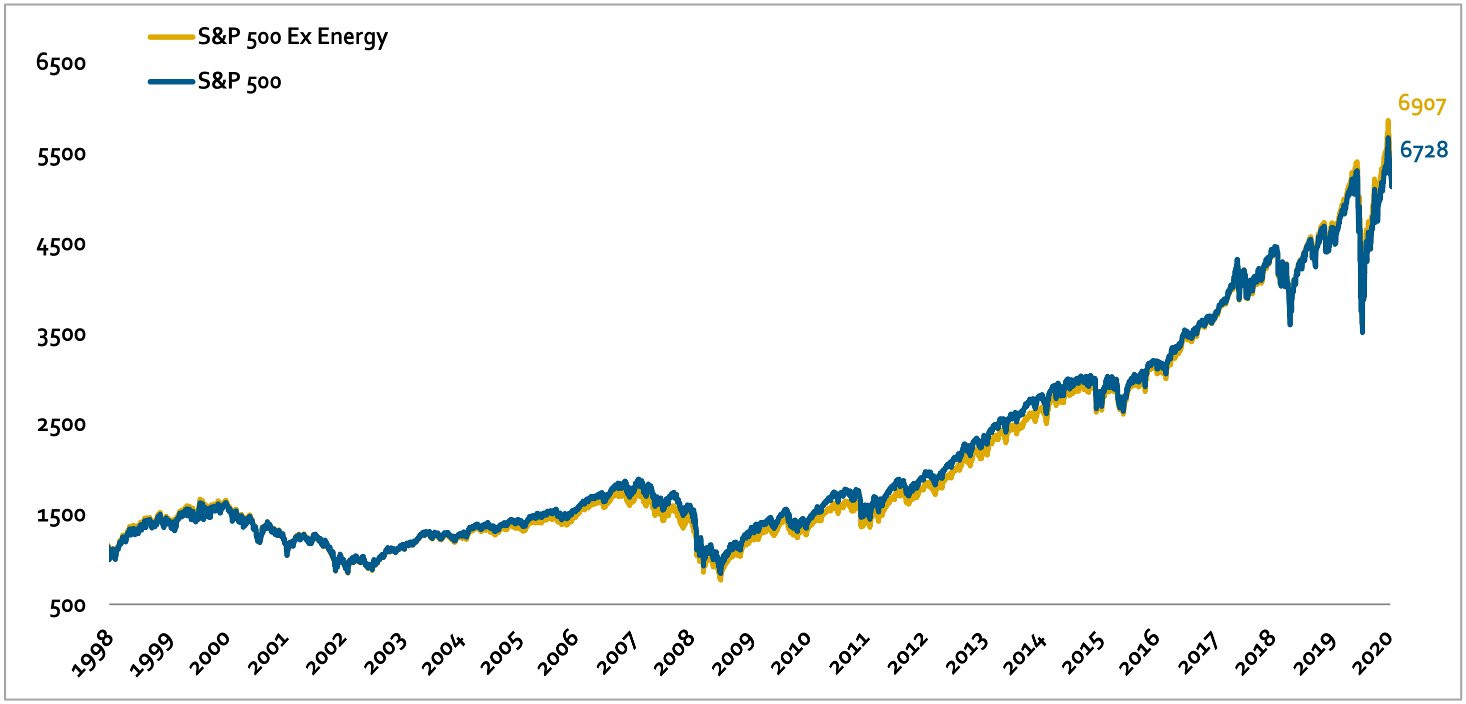
Source: Morgan Stanley Wealth Management Global Investment Office Sustainable Impact Strategy

Fossil-Fuel Aware

The fossil fuel-free S&P 500 Ex Energy Index has performed similar to the broader S&P 500

Cumulative Returns of $1,000 Invested in S&P 500 Index vs. S&P 500 Ex Energy

Daily as of May 31, 2021



Annual Performance (%)

Data as of December 31, 2020

Year	S&P 500 Ex Energy	S&P 500
2020	20.73	18.40
2019	32.58	31.49
2018	-3.48	-4.38
2017	23.70	21.83
2016	10.88	11.96
2015	3.44	1.38
2014	16.14	13.69
2013	33.29	32.39
2012	17.59	16.00
2011	1.75	2.11
2010	14.36	15.06
2009	28.36	26.46
2008	-37.29	-37.00
2007	2.30	5.49
2006	14.92	15.79
2005	2.88	4.91
2004	9.59	10.88
2003	28.88	28.68

Index Performance – Gross Returns (%)

Daily as of May 31, 2021

					ANNUALIZED			
	1 Mo	3 Mo	1 Yr	YTD	3 Yr	5 Yr	10 Yr	15 Yr
S&P 500 Ex Energy	0.57	10.76	41.06	12.00	19.00	18.15	15.83	10.99
S&P 500	0.70	10.72	40.32	12.62	18.04	17.18	14.64	10.48

Index Risk (%)

Daily as of May 31, 2021

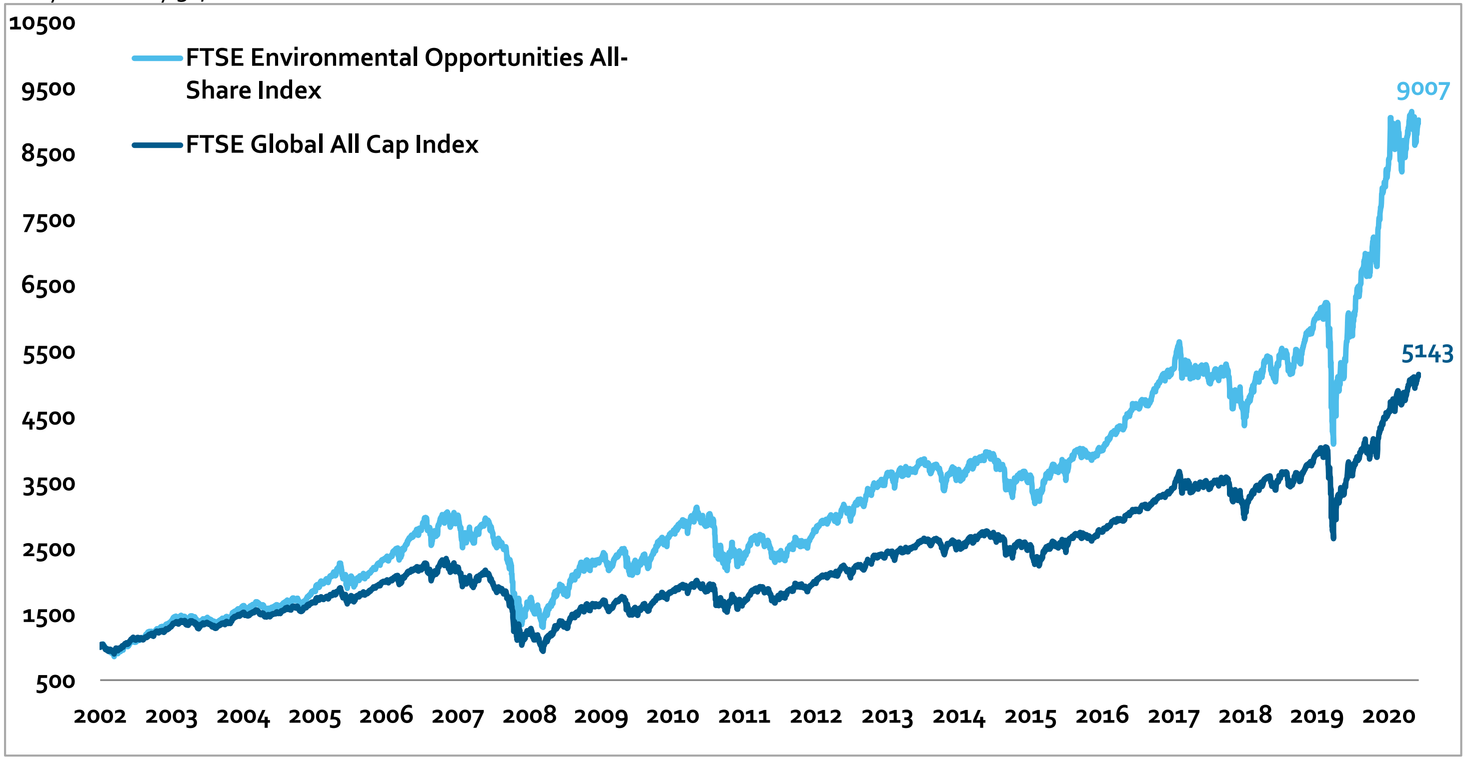
VOLATILITY			
3 Yr	5 Yr	10 Yr	15 Yr
18.29	14.76	13.27	15.35
18.85	15.14	13.61	15.34

Source: Bloomberg, Morgan Stanley Wealth Management Global Investment Office Sustainable Impact Strategy. Charted performance is from December 31, 1997. Index performance is shown gross of fees and does not represent the performance of any specific investment. ***Had the results reflected brokerage commissions, the performance would have been lower.***

Environmental Leaders

Cumulative Returns of $1,000 Invested In FTSE Environmental Opportunities All-Share Index vs. FTSE Global All Cap Index

Daily as of May 31, 2021



Annual Performance (%)

Data as of December 31, 2020

Year	FTSE Environmental	FTSE Global All
2020	39.94	16.76
2019	31.57	27.09
2018	-12.60	-9.60
2017	31.04	24.42
2016	11.59	8.98
2015	-2.00	-1.69
2014	-0.03	4.48
2013	31.72	23.88
2012	16.44	17.22
2011	-13.59	-8.89
2010	18.11	12.12
2009	38.31	33.72
2008	-43.59	-43.85
2007	26.55	9.99

Index Performance – Gross Returns (%)

Daily as of May 31, 2021

					ANNUALIZED			
	1 Mo	3 Mo	1 Yr	YTD	3 Yr	5 Yr	10 Yr	Inception
FTSE Environmental Opp.	0.76	4.82	58.08	6.95	20.14	19.05	11.56	12.65
FTSE Global All Cap	1.95	7.05	43.02	11.85	13.99	14.73	10.08	9.28

Index Risk (%)

Daily as of May 31, 2021

VOLATILITY		
3 Yr	5 Yr	10 Yr
20.73	16.73	16.17
18.80	14.99	14.35

Source: Bloomberg, MSCI, Morgan Stanley Wealth Management Global Investment Office Sustainable Impact Strategy. Charted performance is from December 31, 2002. Index performance is shown gross of fees and does not represent the performance of any specific investment. ***Had the results reflected brokerage commissions, the performance would have been lower.***

Past performance is no guarantee of future results. Estimates of future performance are based on assumptions that may not be realized. This material is not a solicitation of any offer to buy or sell any security or other financial instrument or to participate in any trading strategy. Please refer to important information, disclosures and qualifications at the end of this material.

Climate Solutions Across Public and Private Markets

TARGET RELEVANT SUSTAINABLE DEVELOPMENT GOALS (SDGs)

- The United Nations established the SDGs, a collection of 17 interconnected goals, as a roadmap for investors and organizations to achieve a better and more sustainable future for all by 2030.
- The SDGs are the most comprehensive and commonly accepted set of principles around what is considered sustainable, and help define the universe of issues available for investment.
- Climate solutions contribute to achieving 6 of these goals: clean water and sanitation, affordable and clean energy, industry innovation and infrastructure, climate action, life below water and life on earth.

ENERGY EFFICIENCY

Industry and Buildings

- Smart metering
- Building upgrades
- Energy efficient housing
- Energy efficient air conditioning

WATER

Resource Efficiency

- Combined heat & power
- Sustainable farming
- Water usage
- Water treatment, efficiency & recycling

RENEWABLE ENERGY

Distributed Power

- Commercial & industrial solar
- Micro grids

ENVIRONMENTAL INFRASTRUCTURE

Developed and emerging markets

- Leapfrogging electric grids
- Low-tech solutions
- Waste management

SUSTAINABLE AGRICULTURE

Environmental Quality

- Retrofitting fossil fuel plants
- Renewable chemistry
- Sustainable animal feed

ENERGY POVERTY

Supporting low-cost solutions

- Building materials
- Low cost distributed solutions
- Materials
- Public transportation

SCALABLE CLEAN TECH

Technology

- Batteries and storage
- Waste to energy

Source: Morgan Stanley Wealth Management Global Investment Office Sustainable Impact Strategy

Moving Forward: Developing a Climate-Aware Investment Strategy

The road ahead for investors:

- Amid the global threat of climate change, heightened regulatory disruptions, and the increased availability of data on companies' environmental footprint and practices, investors are seeking guidance around incorporating climate solutions into their portfolios.
- The availability and quality of investments are increasing across asset classes and geographies, giving investors options to define and construct a climate-leader or fossil fuel-aware investment strategy that integrates their environmental impact objectives with their financial goals.

Climate Change Terminology

Alternative Energy: Energy derived from nontraditional sources (e.g., compressed natural gas, solar, hydroelectric, wind).

Carbon Footprint: The total amount of greenhouse gases that are emitted into the atmosphere each year by a person, family, building, organization, or company.

Climate Adaptation: Adjustment of preparation of natural or human systems to a new or changing environment which moderates harm or exploits beneficial opportunities.

Climate Mitigation: Efforts to reduce or prevent emission of greenhouse gases through use of new technologies and renewable energies (making older equipment more energy efficient), or changing management practices or consumer behavior.

Climate Change: Climate change refers to any significant change in the measures of climate lasting for an extended period of time; this includes major changes in weather such as temperature, precipitation, wind patterns, and more.

Emissions: The release of a substance (usually a gas when referring to the subject of climate change) into the atmosphere.

Fossil Fuel: A general term for organic materials formed from decayed plants and animals that have been converted to crude oil, coal, natural goas, or heavy oils by exposure to heat and pressure in the Earth's crust over hundreds of millions of years.

Global Warming: The recent and ongoing global average increase in temperature near the Earth's surface; commonly expressed as a 1.5 °C temperature rise above pre-industrial levels

Greenhouse Gas (GHG): Any gas that absorbs infrared radiation in the atmosphere. Greenhouse gases include carbon dioxide, methane, nitrous oxide, ozone, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride.

Renewable Energy: Energy resources that are naturally replenishing such as biomass, hydro, geothermal, solar, wind, ocean thermal, wave action, and tidal action.

Levelized Cost of Energy (LCOE): Allows different energy generation technologies to be compared, taking into account their cost of production, financing, and generation efficiency. LCOE is defined as the dollar per megawatt hour ($/MWh) of building and operating a generating plant over the lifetime of its usage. Specifically, it is the price for an inflation-adjusted, fixed-price power off-take agreement that, taking into account all project-specific costs, offers the sponsor and/or project developer the minimum equity return necessary to undertake the project.

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Global Investment Manager Analysis (GIMA) Focus List, Approved List and Tactical Opportunities List; Watch Policy. GIMA uses two methods to evaluate investment products in applicable advisory programs: **Focus** (and investment products meeting this standard are described as being on the Focus List) and **Approved** (and investment products meeting this standard are described as being on the Approved List). In general, Focus entails a more thorough evaluation of an investment product than Approved. Sometimes an investment product may be evaluated using the Focus List process but then placed on the Approved List instead of the Focus List. Investment products may move from the Focus List to the Approved List, or vice versa. GIMA may also determine that an investment product no longer meets the criteria under either process and will no longer be recommended in investment advisory programs (in which case the investment product is given a "Not Approved" status). GIMA has a '**Watch**" policy and may describe a Focus List or Approved List investment product as being on "Watch" if GIMA identifies specific areas that (a) merit further evaluation by GIMA and (b) may, but are not certain to, result in the investment product becoming "Not Approved." The Watch period depends on the length of time needed for GIMA to conduct its evaluation and for the investment manager or fund to address any concerns. Certain investment products on either the Focus List or Approved List may also be recommended for the **Tactical Opportunities List** based in part on tactical opportunities existing at a given time. The investment products on the Tactical Opportunities List change over time. For more information on the Focus List, Approved List, Tactical Opportunities List and Watch processes, please see the applicable Form ADV Disclosure Document for Morgan Stanley Wealth Management. Your Financial Advisor or Private Wealth Advisor can also provide upon request a copy of a publication entitled "Manager Selection Process."

The **Global Investment Committee** is a group of seasoned investment professionals who meet regularly to discuss the global economy and markets. The committee determines the investment outlook that guides our advice to clients. They continually monitor developing economic and market conditions, review tactical outlooks and recommend model portfolio weightings, as well as produce a suite of strategy, analysis, commentary, portfolio positioning suggestions and other reports and broadcasts.

The GIC Asset Allocation Models are not available to be directly implemented as part of an investment advisory service and should not be regarded as a recommendation of any Morgan Stanley investment advisory service. The GIC Asset Allocation Models do not represent actual trading or any type of account or any type of investment strategies and none of the fees or other expenses (e.g. commissions, mark-ups, mark-downs, advisory fees, fund expenses) associated with actual trading or accounts are reflected in the GIC Asset Allocation Models which , when compounded over a period of years, would decrease returns.

Adverse Active AlphaSM 2.0 is a patented screening and scoring process designed to help identify high-quality equity and fixed income managers with characteristics that may lead to future outperformance relative to index and peers. While highly ranked managers performed well as a group in our Adverse Active Alpha model back tests, not all of the managers will outperform. Please note that this data may be derived from back-testing, which has the benefit of hindsight. In addition, highly ranked managers can have differing risk profiles that might not be appropriate for all investors.

Our view is that Adverse Active Alpha is a good starting point and should be used in conjunction with other information. Morgan Stanley Wealth Management's qualitative and quantitative investment manager due diligence process are equally important factors for investors when considering managers for use through an investment advisory program. Factors including, but not limited to, manager turnover and changes to investment process can partially or fully negate a positive Adverse Active Alpha ranking. Additionally, highly ranked managers can have differing risk profiles that might not be appropriate for all investors.

The proprietary **Value Score** methodology considers an active investment strategies' value proposition relative to its costs. From a historical quantitative study of several quantitative markers, Value Score measures perceived forward-looking benefit and computes (1) "fair value" expense ratios for most traditional investment managers across 40 categories and (2) managers' perceived "excess value" by comparing the fair value expense ratios to actual expense ratios. Managers are then ranked within each category by their excess value to assign a Value Score. Our analysis suggests that greater levels of excess value have historically corresponded to attractive subsequent performance.

For more information on the ranking models, please see Adverse Active AlphaSM 2.0: Scoring Active Managers According to Potential Alpha and Value Score: Scoring Fee Efficiency by Comparing Managers' "Fair Value" and Actual Expense Ratios. The whitepapers are available from your Financial Advisor or Private Wealth Advisor. ADVERSE ACTIVE ALPHA is a registered service mark of Morgan Stanley and/or its affiliates. U.S. Pat. No. 8,756,098 applies to the Adverse Active Alpha system and/or methodology.

Additionally, highly ranked managers can have differing risk profiles that might not be appropriate for all investors. For more information on AAA, please see the Adverse Active Alpha Ranking Model and Selecting Managers with Adverse Active Alpha whitepapers. The whitepaper are available from your Financial Advisor or Private Wealth Advisor. ADVERSE ACTIVE ALPHA is a registered service mark of Morgan Stanley and/or its affiliates. U.S. Pat. No. 8,756,098 applies to the Adverse Active Alpha system and/or methodology.

The Global Investment Manager Analysis (GIMA) Services Only Apply to Certain Investment Advisory Programs GIMA evaluates certain investment products for the purposes of some – but not all – of Morgan Stanley Smith Barney LLC's investment advisory programs (as described in more detail in the applicable Form ADV Disclosure Document for Morgan Stanley Wealth Management). If you do not invest through one of these investment advisory programs, Morgan Stanley Wealth Management is not obligated to provide you notice of any GIMA Status changes even though it may give notice to clients in other programs.

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In addition, each account that is invested in a program that is eligible to purchase certain investment products, such as mutual funds, will also pay a Platform Fee (which is subject to a Platform Fee offset) as described in the applicable ADV brochure. Accounts invested in the Select UMA program will also pay a separate Morgan Stanley Overlay Manager Fee and any applicable Sub-Manager fees. If your account is invested in mutual funds or exchange traded funds (collectively "funds"), you will pay the fees and expenses of any funds in which your account is invested. Fees and expenses are charged directly to the pool of assets the fund invests in and are reflected in each fund's share price. These fees and expenses are an additional cost to you and would not be included in the Fee amount in your account statements. Overlay Managers or Executing Sub-Managers ("managers") in some of Morgan Stanley's Separately Managed Account ("SMA") programs may affect transactions through broker-dealers other than Morgan Stanley or our affiliates. If your manager trades with another firm, you may be assessed costs by the other firm in addition to Morgan Stanley's fees. Those costs will be included in the net price of the security, not separately reported on trade confirmations or account statements. Certain managers have historically directed most, if not all, of their trades to outside firms. Information provided by managers concerning trade execution away from Morgan Stanley is summarized at: www.morganstanley.com/wealth/investmentsolutions/pdfs/adv/sotresponse.pdf. For more information, please refer to the ADV Brochure for your program(s), available at www.morganstanley.com/ADV or contact your Financial Advisor/Private Wealth Advisor. For example, on an advisory account with a 2.5% annual fee, if the gross annual performance is 6.00%, the compounding effect of the fees will result in a net performance of approximately 3.38% after one year, 10.50% after three years, and 18.10% after five years. **Conflicts of Interest:** GIMA's goal is to provide professional, objective evaluations in support of the Morgan Stanley Wealth Management investment advisory programs. We have policies and procedures to help us meet this goal. However, our business is subject to various conflicts of interest. For example, ideas and suggestions for which investment products should be evaluated by GIMA come from a variety of sources, including our Morgan Stanley Wealth Management Financial Advisors and their direct or indirect managers, and other business persons within Morgan Stanley Wealth Management or its affiliates. Such persons may have an ongoing business relationship with certain investment managers or mutual fund companies whereby they, Morgan Stanley Wealth Management or its affiliates receive compensation from, or otherwise related to, those investment managers or mutual funds. For example, a Financial Advisor may suggest that GIMA evaluates an investment manager or fund in which a portion of his or her clients' assets are already invested. While such a recommendation is permissible, GIMA is responsible for the opinions expressed by GIMA. See the conflicts of interest section in the applicable Form ADV Disclosure Document for Morgan Stanley Wealth Management for a discussion of other types of conflicts that may be relevant to GIMA's evaluation of managers and funds. In addition, Morgan Stanley Wealth Management, MS & Co., managers and their affiliates provide a variety of services (including research, brokerage, asset management, trading, lending and investment banking services) for each other and for various clients, including issuers of securities that may be recommended for purchase or sale by clients or are otherwise held in client accounts , and managers in various advisory programs. Morgan Stanley Wealth Management, managers, MS & Co., and their affiliates receive compensation and fees in connection with these services. Morgan Stanley Wealth Management believes that the nature and range of clients to which such services are rendered is such that it would be inadvisable to exclude categorically all of these companies from an account.

Morgan Stanley charges each fund family we offer a mutual fund support fee, also called a "revenue-sharing payment," on client account holdings in fund families according to a tiered rate that increases along with the management fee of the fund so that lower management fee funds pay lower rates than those with higher management fees.

Consider Your Own Investment Needs: The model portfolios and strategies discussed in the material are formulated based on general client characteristics including risk tolerance. This material is not intended to be an analysis of whether particular investments or strategies are appropriate for you or a recommendation, or an offer to participate in any investment. Therefore, clients should not use this material as the sole basis for investment decisions. They should consider all relevant information, including their existing portfolio, investment objectives, risk tolerance, liquidity needs and investment time horizon. Such a determination may lead to asset allocation results that are materially different from the asset allocation shown in this profile. Talk to your Financial Advisor about what would be an appropriate asset allocation for you, whether CGCM is an appropriate program for you.

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An investment in a money market fund is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. Although the Fund seeks to preserve the value of your investment at $1.00 per share, it is possible to lose money by investing in the fund.

The type of mutual funds and ETFs discussed in this presentation utilizes nontraditional or complex investment strategies and/or derivatives. Examples of these types of funds include those that utilize one or more of the below noted investment strategies or categories or which seek exposure to the following markets: (1) commodities (e.g., agricultural, energy and metals), currency, precious metals;(2) managed futures; (3) leveraged, inverse or inverse leveraged; (4) bear market, hedging, long-short equity, market neutral; (5) real estate; (6) volatility (seeking exposure to the CBOE VIX Index). Investors should keep in mind that while mutual funds and ETFs may, at times, utilize nontraditional investment options and strategies, they should not be equated with unregistered privately offered alternative investments. Because of regulatory limitations, mutual funds and ETFs that seek alternative-like investment exposure must utilize a more limited investment universe. As a result, investment returns and portfolio characteristics of alternative mutual funds and ETFs may vary from traditional hedge funds pursuing similar investment objectives. Moreover, traditional hedge funds have limited liquidity with long "lock-up" periods allowing them to pursue investment strategies without having to factor in the need to meet client redemptions and ETFs trade on an exchange. On the other hand, mutual funds typically must meet daily client redemptions. This differing liquidity profile can have a material impact on the investment returns generated by a mutual fund or ETF pursuing an alternative investing strategy compared with a traditional hedge fund pursuing the same strategy.

Nontraditional investment options and strategies are often employed by a portfolio manager to further a fund's investment objective and to help offset market risks. However, these features may be complex, making it more difficult to understand the fund's essential characteristics and risks, and how it will perform in different market environments and over various periods of time. They may also expose the fund to increased volatility and unanticipated risks particularly when used in complex combinations and/or accompanied by the use of borrowing or "leverage."

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Investing in the markets entails the risk of market volatility. The value of all types of investments, including stocks, mutual funds, exchange-traded funds ("ETFs"), closed-end funds, and unit investment trusts, may increase or decrease over varying time periods. To the extent the investments depicted herein represent **international securities**, you should be aware that there may be additional risks associated with international investing, including foreign economic, political, monetary and/or legal factors, changing currency exchange rates, foreign taxes, and differences in financial and accounting standards. These risks may be magnified in **emerging markets and frontier markets**. **Small- and mid-capitalization companies** may lack the financial resources, product diversification and competitive strengths of larger companies. In addition, the securities of small- and mid-capitalization companies may not trade as readily as, and be subject to higher volatility than, those of larger, more established companies. The value of **fixed income securities** will fluctuate and, upon a sale, may be worth more or less than their original cost or maturity value. Bonds are subject to interest rate risk, call risk, reinvestment risk, liquidity risk, and credit risk of the issuer. **High yield bonds** are subject to additional risks such as increased risk of default and greater volatility because of the lower credit quality of the issues. In the case of **municipal bonds**, income is generally exempt from federal income taxes. Some income may be subject to state and local taxes and to the federal alternative minimum tax. Capital gains, if any, are subject to tax. **Treasury Inflation Protection Securities' (TIPS)** coupon payments and underlying principal are automatically increased to compensate for inflation by tracking the consumer price index (CPI). While the real rate of return is guaranteed, TIPS tend to offer a low return. Because the return of TIPS is linked to inflation, TIPS may significantly underperform versus conventional U.S. Treasuries in times of low inflation. There is no guarantee that investors will receive par if TIPS are sold prior to maturity. The returns on a portfolio consisting primarily of **environmental, social, and governance-aware investments ("ESG")** may be lower or higher than a portfolio that is more diversified or where decisions are based solely on investment considerations. Because ESG criteria exclude some investments, investors may not be able to take advantage of the same opportunities or market trends as investors that do not use such criteria. The companies identified and investment examples are for illustrative purposes only and should not be deemed a recommendation to purchase, hold or sell any securities or investment products. They are intended to demonstrate the approaches taken by managers who focus on ESG criteria in their investment strategy. There can be no guarantee that a client's account will be managed as described herein. **Options** and margin trading involve substantial risk and are not appropriate for all investors. Besides the general investment risk of holding securities that may decline in value and the possible loss of principal invested, **closed-end funds** may have additional risks related to declining market prices relative to net asset values (NAVs), active manager underperformance and potential leverage. Closed-end funds, unlike open-end funds, are not continuously offered. There is a one-time public offering and once issued, shares of closed-end funds are sold in the open market through a stock exchange. Shares of closed-end funds frequently trade at a discount from their NAV which may increase investors' risk of loss. The risk of loss due to this discount may be greater for investors expecting to sell their shares in a relatively short period after completion of the public offering. This characteristic is a risk separate and distinct from the risk that a closed-end fund's net asset value may decrease as a result of investment activities. NAV is total assets less total liabilities divided by the number of shares outstanding. At the time an investor purchases or sells shares of a closed-end fund, shares may have a market price that is above or below NAV. Portfolios that invest a large percentage of assets in only one industry **sector** (or in only a few sectors) are more vulnerable to price fluctuation than those that diversify among a broad range of sectors.

Alternative investments often are speculative and include a high degree of risk. Investors could lose all or a substantial amount of their investment. Alternative investments are appropriate only for eligible, long-term investors who are willing to forgo liquidity and put capital at risk for an indefinite period of time. They may be highly illiquid and can engage in leverage and other speculative practices that may increase the volatility and risk of loss. Alternative Investments typically have higher fees than traditional investments. Investors should carefully review and consider potential risks before investing. 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These limitations include survivorship bias (the returns of the indices may not be representative of all the hedge funds in the universe because of the tendency of lower performing funds to leave the index); heterogeneity (not all hedge funds are alike or comparable to one another, and the index may not accurately reflect the performance of a described style); and limited data (many hedge funds do not report to indices, and the index may omit funds, the inclusion of which might significantly affect the performance shown. The HFRI indices are based on information self-reported by hedge fund managers that decide on their own, at any time, whether or not they want to provide, or continue to provide, information to HFR Asset Management, L.L.C. Results for funds that go out of business are included in the index until the date that they cease operations. Therefore, these indices may not be complete or accurate representations of the hedge fund universe, and may be biased in several ways. Composite index results are shown for illustrative purposes and do not represent the performance of a specific investment. Individual funds have specific tax risks related to their investment programs that will vary from fund to fund. Clients should consult their own tax and legal advisors as Morgan Stanley Wealth Management does not provide tax or legal advice. Interests in alternative investment products are offered pursuant to the terms of the applicable offering memorandum , are distributed by Morgan Stanley Wealth Management and certain of its affiliates, and (1) are not FDIC-insured, (2) are not deposits or other obligations of Morgan Stanley Wealth Management or any of its affiliates, (3) are not guaranteed by Morgan Stanley Wealth Management and its affiliates, and (4) involve investment risks, including possible loss of principal. Morgan Stanley Wealth Management is a registered broker-dealer, not a bank. 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Investment products in this category may employ various investment strategies and techniques for both hedging and more speculative purposes such as short -selling, leverage, derivatives and options, which can increase volatility and the risk of investment loss. Alternative investments are not appropriate for all investors. As a diversified global financial services firm, Morgan Stanley Wealth Management engages in a broad spectrum of activities including financial advisory services, investment management activities, sponsoring and managing private investment funds, engaging in broker-dealer transactions and principal securities, commodities and foreign exchange transactions, research publication, and other activities. In the ordinary course of its business, Morgan Stanley Wealth Management therefore engages in activities where Morgan Stanley Wealth Management's interests may conflict with the interests of its clients, including the private investment funds it manages. 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Clients should consult their own tax and legal advisors as Morgan Stanley Wealth Management does not provide tax or legal advice.

A majority of Alternative Investment managers reviewed and selected by GIMA pay or cause to be paid an ongoing fee for distribution from their management fees to Morgan Stanley Wealth Management in connection with Morgan Stanley Wealth Management clients that purchase an interest in an Alternative Investment and in some instances pay these fees on the investments held by investments held by brokerage clients. Morgan Stanley Wealth Management has a conflict of interest in offering alternative investments because Morgan Stanley Wealth Management or our affiliates, in most instances, earn more money in your account from your investments in alternative investments than from other investment options.

It should be noted that the majority of hedge fund indexes are comprised of hedge fund manager returns. This is in contrast to traditional indexes, which are comprised of individual securities in the various market segments they represent and offer complete transparency as to membership and construction methodology. As such, some believe that hedge fund index returns have certain biases that are not present in traditional indexes. Some of these biases inflate index performance, while others may skew performance negatively. However, many studies indicate that overall hedge fund index performance has been biased to the upside. Some studies suggest performance has been inflated by up to 260 basis points or more annually depending on the types of biases included and the time period studied. Although there are numerous potential biases that could affect hedge fund returns, we identify some of the more common ones throughout this paper.

Self-selection bias results when certain manager returns are not included in the index returns and may result in performance being skewed up or down. Because hedge funds are private placements, hedge fund managers are able to decide which fund returns they want to report and are able to opt out of reporting to the various databases. Certain hedge fund managers may choose only to report returns for funds with strong returns and opt out of reporting returns for weak performers. Other hedge funds that close may decide to stop reporting in order to retain secrecy, which may cause a downward bias in returns.

Survivorship bias results when certain constituents are removed from an index. This often results from the closure of funds due to poor performance, "blow ups," or other such events. As such, this bias typically results in performance being skewed higher. As noted, hedge fund index performance biases can result in positive or negative skew. However, it would appear that the skew is more often positive. While it is difficult to quantify the effects precisely, investors should be aware that idiosyncratic factors may be giving hedge fund index returns an artificial "lift" or upwards bias.

Hedge Funds of Funds and many funds of funds are private investment vehicles restricted to certain qualified private and institutional investors. They are often speculative and include a high degree of risk. Investors can lose all or a substantial amount of their investment. They may be highly illiquid, can engage in leverage and other speculative practices that may increase volatility and the risk of loss, and may be subject to large investment minimums and initial lockups. They involve complex tax structures, tax-inefficient investing and delays in distributing important tax information. Categorically, hedge funds and funds of funds have higher fees and expenses than traditional investments, and such fees and expenses can lower the returns achieved by investors. Funds of funds have an additional layer of fees over and above hedge fund fees that will offset returns. An investment in an **exchange-traded fund** involves risks similar to those of investing in a broadly based portfolio of equity securities traded on an exchange in the relevant securities market, such as market fluctuations caused by such factors as economic and political developments, changes in interest rates and perceived trends in stock and bond prices. An investment in a **target date portfolio** is subject to the risks attendant to the underlying funds in which it invests, in these portfolios the funds are the Consulting Group Capital Market funds. A target date portfolio is geared to investors who will retire and/or require income at an approximate year. The portfolio is managed to meet the investor's goals by the pre-established year or "target date." A target date portfolio will transition its invested assets from a more aggressive portfolio to a more conservative portfolio as the target date draws closer. An investment in the target date portfolio is not guaranteed at any time, including, before or after the target date is reached. **Managed futures** investments are speculative, involve a high degree of risk, use significant leverage, are generally illiquid, have substantial charges, subject investors to conflicts of interest, and are appropriate only for the risk capital portion of an investor's portfolio. Managed futures investments do not replace equities or bonds but rather may act as a complement in a well diversified portfolio. Managed Futures are complex and not appropriate for all investors. **Rebalancing** does not protect against a loss in declining financial markets. There may be a potential tax implication with a rebalancing strategy.

Buying, selling, and transacting in Bitcoin or other digital assets, and related funds and products, is highly speculative and <u>may result in a loss of the entire investment</u>. Risks and considerations include but are not limited to:

- Bitcoin and other digital assets have only been in existence for a short period of time and historical trading prices for Bitcoin and other digital assets have been highly volatile . The price of Bitcoin and other digital assets could decline rapidly, and **<u>investors could lose their entire investment</u>**.

- Certain digital asset funds and products, including Bitcoin funds and products, allow investors to invest on a more frequent basis than investors may withdraw from the fund or product, and interests in such funds or products are generally not freely transferrable. This means that, particularly given the volatility of digital assets, including Bitcoin, an investor will have to bear any losses with respect to its investment for an extended period of time and will not be able to react to changes in the price of the digital asset once invested (for example, by seeking to withdraw) as quickly as when making the decision to invest. Such digital asset funds and products, including Bitcoin funds and products, are intended only for persons who are able to bear the economic risk of investment and who do not need liquidity with respect to their investments.

- Given the volatility in the price of Bitcoin and other digital assets, the net asset value of a fund or product that invests in such assets at the time an investor's subscription for interests in the fund or product is accepted may be significantly below or above the net asset value of the product or fund at the time the investor submitted subscription materials.

- Certain digital assets, apart from Bitcoin, are not intended to function as currencies but are intended to have other use cases. These other digital assets may be subject to some or all of the risks and considerations set forth herein, as well as additional risks applicable to such other digital assets. Buyers, sellers and users of such other digital assets should thoroughly familiarize themselves with such risks and considerations before transacting in such other digital assets.

- The value of Bitcoin and other digital assets may be negatively impacted by future legal and regulatory developments, including but not limited to increased regulation of Bitcoin or such other digital assets. Any such developments may make Bitcoin or such other digital assets less valuable, impose additional burdens and expenses on a fund or product investing in such assets or impact the ability of such a fund or product to continue to operate, which may materially decrease the value of an investment therein.

- Due to the new and evolving nature of digital currencies and the absence of comprehensive guidance, many significant aspects of the tax treatment of digital assets including Bitcoin are uncertain. Prospective investors should consult their own tax advisors concerning the tax consequences to them of the purchase, ownership and disposition of Bitcoin and other digital assets, directly or indirectly through a fund or product, under U.S. federal income tax law, as well as the tax law of any relevant state, local or other jurisdiction.

- Over the past several years, certain Bitcoin exchanges have experienced failures or interruptions in service due to fraud, security breaches, operational problems or business failure. Such events in the future could impact any fund's or product's ability to transact in Bitcoin if the fund or product relies on an impacted exchange and may also materially decrease the price of Bitcoin, thereby impacting the value of your investment, regardless of whether the fund or product relies on such an impacted exchange.

- Although any digital asset product, including a Bitcoin-related product, and its service providers have in place significant safeguards against loss, theft, destruction and inaccessibility, there is nonetheless a risk that some or all of a product's digital asset, including Bitcoin, could be permanently lost, stolen, destroyed or inaccessible by virtue of, among other things, the loss or theft of the "private keys" necessary to access a product's digital asset, including Bitcoin.

- Investors in funds or products investing or transacting in Bitcoin and/or other digital assets may not benefit to the same extent (or at all) from "airdrops" with respect to, or "forks" in, the Bitcoin (or other relevant digital asset's) blockchain, compared to investors who hold Bitcoin (or such other relevant digital asset) directly instead of through a fund or product. Additionally, a "fork" in the Bitcoin blockchain could materially decrease the price of Bitcoin.

- Digital assets such as Bitcoin or other digital asset product is/are not legal tender, and is not backed by any government, corporation or other identified body, other than with respect to certain digital currencies that certain governments are or may be developing now or in the future (of which Bitcoin is **not** one). No law requires companies or individuals to accept digital currency as a form of payment (except, potentially, with respect to digital currencies developed by certain governments where such acceptance may be mandated). Instead, other than as described in the preceding sentences, Bitcoin's and other digital asset products' use is limited to businesses and individuals that are willing to accept them. If no one were to accept digital currencies, Bitcoin and other virtual currency products would very likely become worthless.

- Platforms that buy and sell Bitcoin or other digital assets can be hacked, and some have failed. In addition, like the platforms themselves, digital wallets can be hacked, and are subject to theft and fraud. As a result, like other investors have, you can lose some or all of your holdings of digital assets, including Bitcoin.

- Unlike US banks and credit unions that provide certain guarantees of safety to depositors, there are no such safeguards provided to digital assets, such as Bitcoin, held in digital wallets by their providers or by regulators.

- Due to the anonymity Bitcoin and other digital assets offer, it has known use in illegal activity, including drug dealing, money laundering, human trafficking, sanction evasion and other forms of illegal commerce. Abuses could impact legitimate consumers and speculators; for instance, law enforcement agencies could shut down or restrict the use of platforms and exchanges, limiting or shutting off entirely the ability to use or trade Bitcoin or other digital asset products.

- Bitcoin and other digital assets may not have an established track record of credibility and trust. Further, any performance data relating to Bitcoin, Bitcoin-related products or other digital asset products may not be verifiable as pricing models are not uniform.

- Investors should be aware of the potentially increased risks of transacting in digital assets, including Bitcoin, relating to the risks and considerations, including fraud, theft, and lack of legitimacy, and other aspects and qualities of digital assets, before transacting in such assets.

- The exchange rate of Bitcoin or other virtual currency products versus the USD historically has been very volatile and the exchange rate could drastically decline. For example, the exchange rate of Bitcoin versus the USD has in the past dropped more than 50% in a single day. Bitcoin may be affected by such volatility as well.

- Digital asset exchanges have limited operating and performance histories and are not regulated with the same controls or customer protections available to more traditional exchanges transacting equity, debt, and other assets and securities. There is no assurance that a person/exchange who currently accepts a digital asset as payment will continue to do so in the future.

- The regulatory framework of digital assets is evolving, and in some cases uncertain, and digital assets themselves may not be governed and protected by applicable securities regulators and securities laws, including, but not limited to, Securities Investor Protection Corporation coverage, or other regulatory regimes.

- Morgan Stanley Smith Barney LLC or its affiliates (collectively, "Morgan Stanley") may currently, or in the future, offer or invest in digital asset products, services or platforms. The proprietary interests of Morgan Stanley may conflict with your interests.

- The foregoing list of considerations and risks are not and do not purport to be a complete enumeration or explanation of the risks involved in an investment in the any product or fund investing or trading in Bitcoin and/or other digital assets.

Asset allocation and diversification do not assure a profit or protect against loss in declining financial markets. Past performance is no guarantee of future results. Actual results may vary.

Tax laws are complex and subject to change. Morgan Stanley Smith Barney LLC ("Morgan Stanley"), its affiliates and Morgan Stanley Financial Advisors and Private Wealth Advisors do not provide tax or legal advice and are not "fiduciaries" (under ERISA, the Internal Revenue Code or otherwise) with respect to the services or activities described herein except as otherwise provided in writing by Morgan Stanley and/or as described at www.morganstanley.com/disclosures/dol. Individuals are encouraged to consult their tax and legal advisors (a) before establishing a retirement plan or account, and (b) regarding any potential tax, ERISA and related consequences of any investments made under such plan or account.

Annuities and insurance products are offered in conjunction with Morgan Stanley Smith Barney LLC's licensed insurance agency affiliates.

Indices are unmanaged and investors cannot directly invest in them. They are not subject to expenses or fees and are often comprised of securities and other investment instruments the liquidity of which is not restricted. A particular investment product may consist of securities significantly different than those in any index referred to herein. Composite index results are shown for illustrative purposes only, generally do not represent the performance of a specific investment, may not, for a variety of reasons, be an appropriate comparison or benchmark for a particular investment and may not necessarily reflect the actual investment strategy or objective of a particular investment. Consequently, comparing an investment to a particular index may be of limited use.

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We may act in the capacity of a broker or that of an advisor. As your broker, we are not your fiduciary and our interests may not always be identical to yours. Please consult with your Private Wealth Advisor to discuss our obligations to disclose to you any conflicts we may from time to time have and our duty to act in your best interest. We may be paid both by you and by others who compensate us based on what you buy. Our compensation, including that of your Private Wealth Advisor, may vary by product and over time.

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For index, indicator and survey definitions referenced in this report please visit the following: https://www.morganstanley.com/wealth-investmentsolutions/wmir-definitions

GLOBAL INVESTMENT COMMITTEE (GIC) ASSET ALLOCATION MODELS: The Asset Allocation Models are created by Morgan Stanley Wealth Management's GIC.

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GIC Asset Allocation Model for the periods indicated. Despite the limitations of hypothetical performance, these hypothetical performance results allow clients and Financial Advisors to obtain a sense of the risk/return trade-off of different asset allocation constructs. The hypothetical performance results in this report are calculated using the returns of benchmark indices for the asset classes, and not the returns of securities, fund or other investment products. Models may contain allocations to Hedge Funds, Private Equity and Private Real Estate. The benchmark indices for these asset classes are not issued on a daily basis. When calculating model performance on a day for which no benchmark index data is issued, we have assumed straight line growth between the index levels issued before and after that date.

FEES REDUCE THE PERFORMANCE OF ACTUAL ACCOUNTS: None of the fees or other expenses (e.g. commissions, mark-ups, mark-downs, fees) associated with actual trading or accounts are reflected in the GIC Asset Allocation Models. The GIC Asset Allocation Models and any model performance included in this presentation are intended as educational materials. Were a client to use these models in connection with investing, any investment decisions made would be subject to transaction and other costs which, when compounded over a period of years, would decrease returns. Information regarding Morgan Stanley's standard advisory fees is available in the Form ADV Part 2, which is available at www.morganstanley.com/adv. The following hypothetical illustrates the compound effect fees have on investment returns: For example, if a portfolio's annual rate of return is 15% for 5 years and the account pays 50 basis points in fees per annum, the gross cumulative five-year return would be 101.1% and the five-year return net of fees would be 96.8%. Fees and/or expenses would apply to clients who invest in investments in an account based on these asset allocations, and would reduce clients' returns. The impact of fees and/or expenses can be material.

Variable annuities are long-term investments designed for retirement purposes and may be subject to market fluctuations, investment risk, and possible loss of principal. All guarantees, including optional benefits, are based on the financial strength and claims-paying ability of the issuing insurance company and do not apply to the underlying investment options. Optional riders may not be able to be purchased in combination and are available at an additional cost. Some optional riders must be elected at time of purchase. Optional riders may be subject to specific limitations, restrictions, holding periods, costs, and expenses as specified by the insurance company in the annuity contract. If you are investing in a **variable annuity** through a tax-advantaged retirement plan such as an IRA, you will get no additional tax advantage from the variable annuity. Under these circumstances, you should only consider buying a variable annuity because of its other features, such as lifetime income payments and death benefits protection. Taxable distributions (and certain deemed distributions) are subject to ordinary income tax and, if taken prior to age 59½, may be subject to a 10% federal income tax penalty. Early withdrawals will reduce the death benefit and cash surrender value.

Equity securities may fluctuate in response to news on companies, industries, market conditions and general economic environment. **Ultrashort-term fixed income** asset class is comprised of fixed income securities with high quality, very short maturities. They are therefore subject to the risks associated with debt securities such as credit and interest rate risk.

Master Limited Partnerships (MLPs) are limited partnerships or limited liability companies that are taxed as partnerships and whose interests (limited partnership units or limited liability company units) are traded on securities exchanges like shares of common stock. Currently, most MLPs operate in the energy, natural resources or real estate sectors. Investments in MLP interests are subject to the risks generally applicable to companies in the energy and natural resources sectors, including commodity pricing risk, supply and demand risk, depletion risk and exploration risk. Individual MLPs are publicly traded partnerships that have unique risks related to their structure. These include, but are not limited to, their reliance on the capital markets to fund growth, adverse ruling on the current tax treatment of distributions (typically mostly tax deferred), and commodity volume risk. The potential tax benefits from investing in MLPs depend on their being treated as partnerships for federal income tax purposes and, if the MLP is deemed to be a corporation, then its income would be subject to federal taxation at the entity level, reducing the amount of cash available for distribution to the fund which could result in a reduction of the fund's value. MLPs carry interest rate risk and may underperform in a rising interest rate environment. MLP funds accrue deferred income taxes for future tax liabilities associated with the portion of MLP distributions considered to be a tax-deferred return of capital and for any net operating gains as well as capital appreciation of its investments; this deferred tax liability is reflected in the daily NAV, and, as a result, the MLP fund's after-tax performance could differ significantly from the underlying assets even if the pre-tax performance is closely tracked.

Investing in commodities entails significant risks. Commodity prices may be affected by a variety of factors at any time, including but not limited to, (i) changes in supply and demand relationships, (ii) governmental programs and policies, (iii) national and international political and economic events, war and terrorist events, (iv) changes in interest and exchange rates, (v) trading activities in commodities and related contracts, (vi) pestilence, technological change and weather, and (vii) the price volatility of a commodity. In addition, the commodities markets are subject to temporary distortions or other disruptions due to various factors, including lack of liquidity, participation of speculators and government intervention. **Physical precious metals** are non-regulated products. Precious metals are speculative investments, which may experience short-term and long term price volatility. The value of precious metals investments may fluctuate and may appreciate or decline, depending on market conditions. Unlike bonds and stocks, precious metals do not make interest or dividend payments. Therefore, precious metals may not be appropriate for investors who require current income. Precious metals are commodities that should be safely stored, which may impose additional costs on the investor.

REITs investing risks are similar to those associated with direct investments in real estate: property value fluctuations, lack of liquidity, limited diversification and sensitivity to economic factors such as

interest rate changes and market recessions. Risks of **private real estate** include: illiquidity; a long-term investment horizon with a limited or nonexistent secondary market; lack of transparency; volatility (risk of loss); and leverage. Principal is returned on a monthly basis over the life of a **mortgage-backed security.** Principal prepayment can significantly affect the monthly income stream and the maturity of any type of MBS, including standard MBS, CMOs and Lottery Bonds. **Asset-backed securities** generally decrease in value as a result of interest rate increases, but may benefit less than other fixed-income securities from declining interest rates, principally because of prepayments.
Yields are subject to change with economic conditions. Yield is only one factor that should be considered when making an investment decision. **Credit ratings** are subject to change. **Duration**, the most commonly used measure of bond risk, quantifies the effect of changes in interest rates on the price of a bond or bond portfolio. The longer the duration, the more sensitive the bond or portfolio would be to changes in interest rates. The majority of $25 and $1000 par **preferred securities** are "callable" meaning that the issuer may retire the securities at specific prices and dates prior to maturity. Interest/dividend payments on certain preferred issues may be deferred by the issuer for periods of up to 5 to 10 years, depending on the particular issue. The investor would still have income tax liability even though payments would not have been received. Price quoted is per $25 or $1,000 share, unless otherwise specified. Current yield is calculated by multiplying the coupon by par value divided by the market price. The initial interest rate on a **floating-rate security** may be lower than that of a fixed-rate security of the same maturity because investors expect to receive additional income due to future increases in the floating security's underlying reference rate. The reference rate could be an index or an interest rate. However, there can be no assurance that the reference rate will increase. Some floating-rate securities may be subject to call risk. The market value of **convertible bonds** and the underlying common stock(s) will fluctuate and after purchase may be worth more or less than original cost. If sold prior to maturity, investors may receive more or less than their original purchase price or maturity value, depending on market conditions. Callable bonds may be redeemed by the issuer prior to maturity. Additional call features may exist that could affect yield. Some $25 or $1000 **par preferred securities** are QDI (Qualified Dividend Income) eligible. Information on QDI eligibility is obtained from third party sources. The dividend income on QDI eligible preferreds qualifies for a reduced tax rate. Many traditional 'dividend paying' perpetual preferred securities (traditional preferreds with no maturity date) are QDI eligible. In order to qualify for the preferential tax treatment all qualifying preferred securities must be held by investors for a minimum period – 91 days during a 180 day window period, beginning 90 days before the ex-dividend date.
Companies paying **dividends** can reduce or cut payouts at any time.

Nondiversification: For a portfolio that holds a concentrated or limited number of securities, a decline in the value of these investments would cause the portfolio's overall value to decline to a greater degree than a less concentrated portfolio. The **indices selected by Morgan Stanley Wealth Management** to measure performance are representative of broad asset classes. Morgan Stanley Wealth Management retains the right to change representative indices at any time. Because of their narrow focus, **sector investments** tend to be more volatile than investments that diversify across many sectors and companies.

Growth investing does not guarantee a profit or eliminate risk. The stocks of these companies can have relatively high valuations. Because of these high valuations, an investment in a growth stock can be more risky than an investment in a company with more modest growth expectations. **Value investing** does not guarantee a profit or eliminate risk. Not all companies whose stocks are considered to be value stocks are able to turn their business around or successfully employ corrective strategies which would result in stock prices that do not rise as initially expected.
Any type of **continuous or periodic investment plan** does not assure a profit and does not protect against loss in declining markets. Since such a plan involves continuous investment in securities regardless of fluctuating price levels of such securities, the investor should consider his financial ability to continue his purchases through periods of low price levels.
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