

The decarbonizing portfolio



A sustainable investment strategy for a low-carbon future

The decarbonizing portfolio



- 04 Foreword
- 06 Investing for a sustainable future
- 08 Threats from climate change
- 10 A growth story
- 12 Financing goes green
- 14 The case for investor action on climate change
- 24 Top 10 climate innovations for the 2020s
- 26 How investors are responding
- 32 A time for action
- 36 The sustainable asset class universe
- 38 Building it better
- 40 Conclusion

Foreword

Sustainable and impact investing has come a long way. When Credit Suisse began the sustainable investments journey with our clients nearly two decades ago, there were very few sustainable options available in the market and even fewer that proactively sought to address climate change. In the early days of values-aligned investing, we started by offering portfolios that excluded so-called “sin stocks,” such as tobacco and controversial weapons. In 2002, we helped co-found one of the first impact fund managers, Responsibility Investments, focused on financial inclusion through microfinance lending in developing markets.

As early-adopter investors began to link the power of their capital to drive positive change, the sustainable finance field took a significant step forward with the launch of the UN Principles for Responsible Investment (UNPRI) in 2006.

With an ever greater number of signatories committed to following the UNPRI guidance, the number of asset managers launching environmental, social and governance (ESG) strategies grew in parallel, and sustainable finance was transformed from a retail “ethical” investment niche into an institutional market focusing on improved risk/return through the integration of material sustainability factors.

The last decade and indeed the last year alone have seen unprecedented growth in sustainable and impact investing, driven in part by an even greater recognition from the world’s leading investors that exciting opportunities exist to tackle systemic challenges while also generating attractive returns. The existential threat of climate change may be the greatest challenge of our lifetime, which presents tangible physical and valuation risk for investors, but also offers significant returns potential from the inevitable shift to a low-carbon economy.



At Credit Suisse, we want to play a meaningful role in helping to ensure that our clients’ portfolios are “climate transition ready.” Not only do we view climate risk as a material issue that needs to be integrated into our mainstream investment process, but we seek to offer our clients opportunities to gain exposure to the sectors which will benefit from this transition, such as green energy, sustainable and regenerative food production, smart cities and water access.

While our clients increasingly recognize the importance of climate change, many do not yet know how to go about integrating these considerations into their portfolios. Adding to the complexity, the methodologies are developing fast. For example, carbon footprinting was considered cutting edge a few years ago, whereas investors can now analyze the climate preparedness of their portfolios and the degree to which they align with a 1.5°C global warming scenario.

This publication is designed to help clients explore the issue of climate change from an investment perspective, and how it can be addressed in a portfolio context. We look at

ways to assess the climate preparedness of a portfolio and steps investors can take to manage the risks and leverage the opportunities that will come from the climate transition. The “decarbonizing portfolio” has two meanings: first, that the portfolio reduces its exposure to carbon risk and aligns with a low-carbon future; and second, that the portfolio proactively contributes to decarbonizing the economy. It is not only important that clients take climate risk and opportunity into account from a financial perspective, but it is also vital that they help fund the solutions required to address this global challenge.

Today at Credit Suisse, we are pleased that we are able to offer dozens of funds and single instrument options that capture the broad climate thematic. Our goal going forward is to continue to expand our investment suite to provide our clients with an increasingly larger diversified set of options to decarbonize their portfolio, in line with our motto, “Generate returns. Sustainably.”

We hope you enjoy reading this publication and we look forward to engaging with you on this important topic.

Marisa Drew
Chief Sustainability Officer & Global Head Sustainability Strategy Advisory and Finance

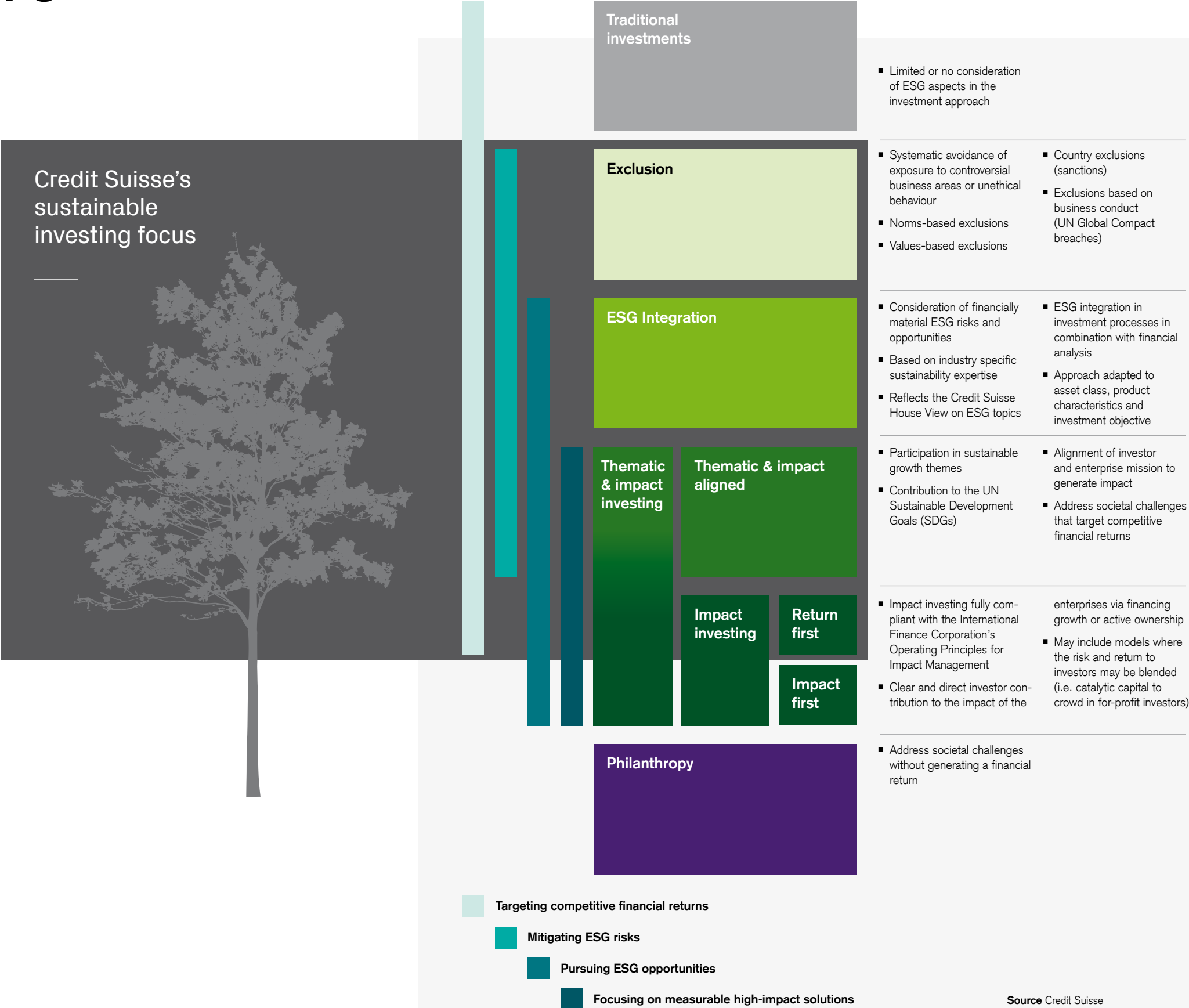
Michael Strobaek
Global Chief Investment Officer

Investing for a sustainable future

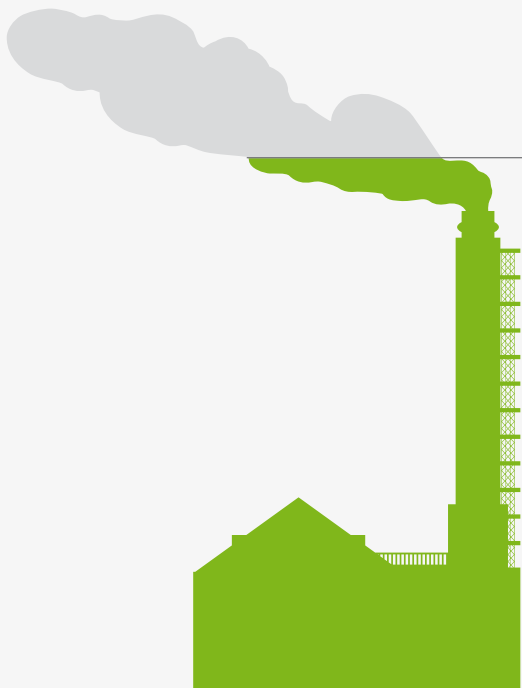
Sustainable investing covers a variety of investment strategies and approaches.

At Credit Suisse, we focus on the part of the spectrum that combines financial returns (comparable with traditional investment strategies) and sustainability. These range from simple exclusions of controversial sectors such as weapons and adult entertainment, through to environmental, social and governance (ESG) integration strategies that seek to outperform or manage risks associated with sustainability, as well as thematic/impact-aligned and impact investing approaches that focus on companies and projects whose products and services directly solve social and environmental challenges.

In this paper, we explore how to create a portfolio containing investments that reach across this spectrum, and address the risks and opportunities that will come from the carbon transition.



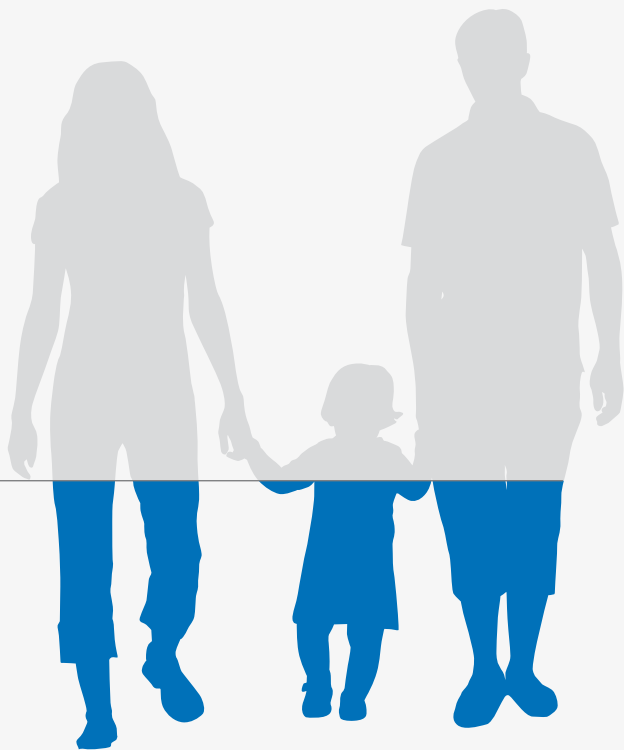
Threats from climate change



+ 78%

Fossil fuels

Burning fossil fuels is the main cause of global warming and climate change. Between 1970 and 2011, greenhouse gas (GHG) emissions caused by fossil fuels increased by 78%.



+ 2 feet

Rising sea levels

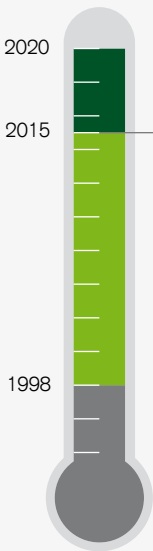
Under a 2°C global warming scenario, sea levels are predicted to rise by a minimum of 2 feet. By 2050, this could displace approx. 1 billion people.



26 m people

Extreme weather conditions

A recent World Bank report states that the impact of extreme weather conditions is driving 26 million people into poverty each year.



5 years

Heat stress

The past five years were the hottest since records began, and the 20 warmest years on record were in the past 22 years.



800,000 km²

Deforestation

Forests play an integral role in the carbon cycle. Yet 80 million hectares of primary forest have been destroyed in the last 30 years.



+ 70%

Air pollution

Concentrated energy consumption in urban areas leads to greater air pollution, with significant effects on human health. Cities cause more than 70% of global CO₂ emissions.

Sources United Nations, WWF, NASA, World Bank, Credit Suisse

A growth story

According to the Global Sustainable Investment Alliance,¹ sustainable investments, broadly defined, have more than doubled in volume over the last five years. Impact investment – the subset of the sustainable investing spectrum that can demonstrate measurable impact – has grown even faster over a similar period. While traditional investment funds have seen outflows, sustainable and impact funds have experienced strong growth and are one of the few bright spots in the asset management industry. There are many drivers of this growth, including the recognition of the urgency of climate change.

▪ **Public sentiment and policy**

We are seeing a rapid shift in public sentiment around sustainability, and regulators are stepping up to introduce policies to decarbonize the economy. This has significant implications for business and investment.

▪ **Consumers**

As climate change and other sustainability issues become more important to ordinary consumers in their purchasing decisions, companies are increasingly seeking out these “responsible consumers,” creating new opportunities for sustainable products and services.

▪ **Investment case**

There is now a recognition of the importance of ESG risks and opportunities to the future of business and investment. Many investors now see climate change as one of the key material issues to be considered throughout the investment process.

▪ **Demand from clients**

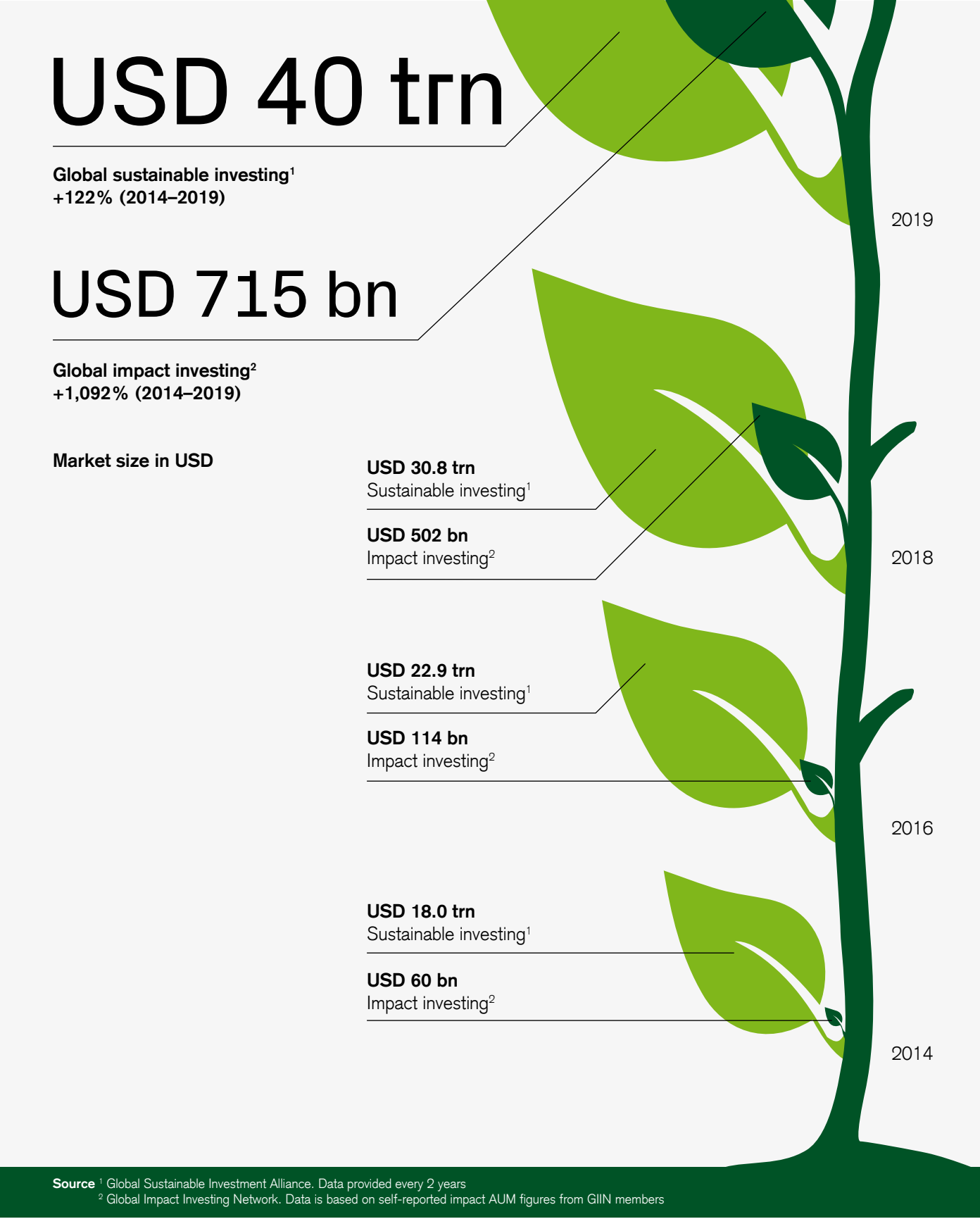
Institutional investors, and increasingly family offices and ultra high net-worth (UHNW) individuals, are putting capital to work in ESG and, in particular, climate-related solutions at unprecedented volumes to leverage this investment case. They are also demanding that their fund managers integrate climate and other ESG risks into core investment processes.

▪ **Supply from fund managers**

As demand has increased, so too has the supply of sustainable, impact and climate-related investment strategies. The graphic on page 11 highlights this growth.

▪ **Civil society campaigns**

Activist groups are campaigning successfully for institutional investors (particularly university endowments) to divest from fossil fuels and invest into climate solutions.



Financing goes green

Total global climate finance flows
in USD

546 bn

+64.1%

349.5 bn

2018

2013

Source Climate Policy Initiative

Beyond equities: A look at emerging climate-related investments

Product innovation

There has been tremendous innovation in the climate-focused investment space in recent years, including:

- The first climate-focused hedge funds.
- Fossil fuel-free portfolios for those investors who would like to completely exclude these sectors.
- A vibrant climate innovation venture capital space, including entirely new climate-friendly industries such as plant-based and cellular meat.
- The emergence of transition bonds.
- Methodologies to assess carbon exposure in portfolios.
- Impact metrics to assess the contribution of companies' products and services to climate solutions.

Climate-focused hedge funds

Hedge funds have been largely missing from sustainable portfolios until recently. We now see the emergence of long-short equity strategies premised on the view that the rapid shift in public sentiment and policy-making regarding the climate will lead to a large variation in the fortunes of companies that stand to gain from the resulting transition, and those that will lose. Investors can therefore exploit this dispersion in outcomes. By focusing not just on the winners from climate change, these strategies can also profit from shorting the losers.

+2,350%

Transition bonds

While green bonds are used to finance investments that have a long-term role to play in the low carbon economy, transition bonds are used to finance investments that are making a substantial contribution to global emissions but do not have a long-term role to play. Unlike green bonds with fund-specific green projects, transition bonds can finance "brown" companies in the reduction of their emissions.

For example, to finance:

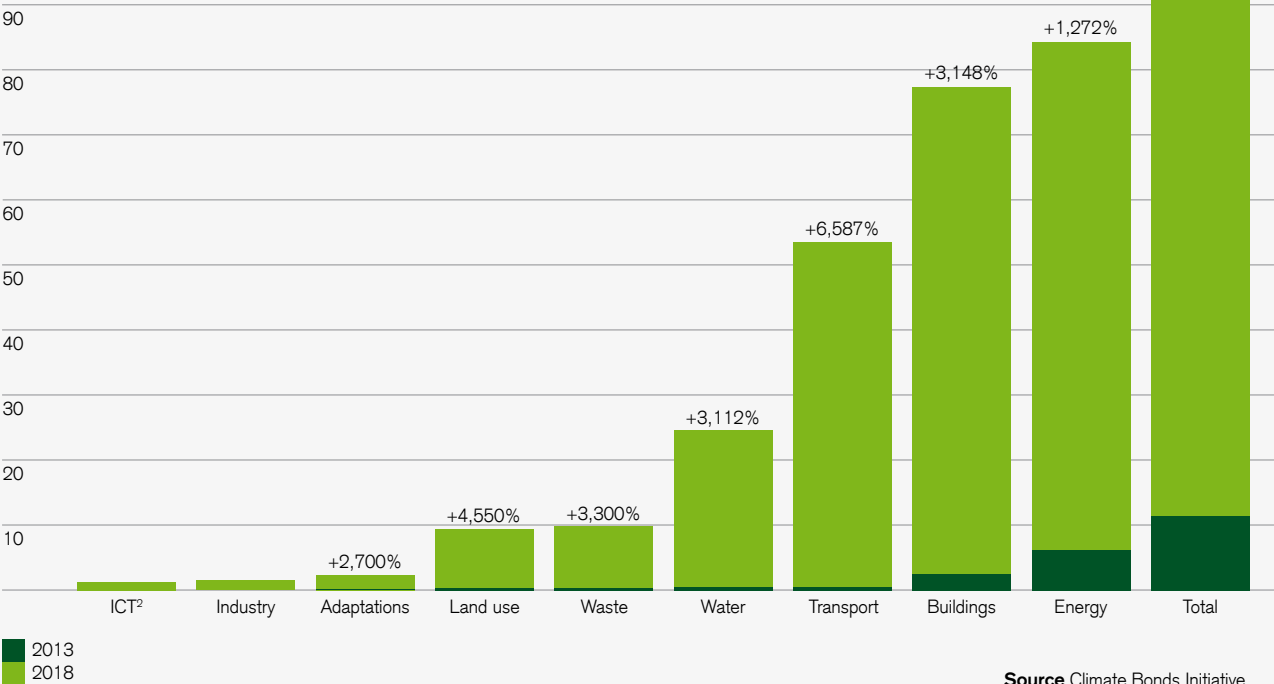
- Investments to eliminate gas flaring
- Early fossil fuel plant closure
- Upgrading gas networks for green hydrogen

Growth in climate-related finance has been rapid. Green bonds, in particular, are one of the fastest-growing segments within the climate-focused investment sector. Green bonds are fixed income instruments that finance green or climate-related projects, from renewable energy infrastructure to public transportation, and are typically backed by the issuer's balance sheet. More than USD 100 billion of sustainable bonds were issued globally in the first half of 2020.

Indeed, 2020 was a record year for clean investment, with historic levels of capital committed for clean energy investing and sustainable finance despite the COVID-19 pandemic.²

Green bonds are red hot

Annual green bond volume from 2013–2018 (USD billion)



Source Climate Bonds Initiative

The case for investor action on climate change

The threats of climate change are well established, and it is likely that the economy will go through a major transition as the world decarbonizes. This will create both risks and opportunities for investors.

Risks

Over recent years, hundreds of countries have adopted climate-focused regulation, including green power policies, pro-climate transport strategies, carbon-pricing regimes and mandates around low-emission industrial processes. Western economies are at the forefront of CO₂ reduction commitments. And even when national governments are not taking a leadership role, regional and local governments are stepping up and driving pro-climate policies.

However, regulatory risk is only one key risk for companies and investors. The transition to a low-carbon future will entail disruption to many different sectors and supply chains, and the emergence of new technologies will affect various parts of the economy in different ways. Many companies will need to completely transition their business models, and some will do this better than others.

Risks associated with climate change come in two broad types: risks from disruption due to regulation and the technological shift to a low-carbon economy; and risks associated with the impacts of climate change itself, such as damage to facilities from increasingly severe storms or ill-health – the latter ranked by the Intergovernmental Panel on Climate Change (IPCC) as one of the five key risks of climate change.³

Key risks to portfolios that may arise from the carbon transition include:

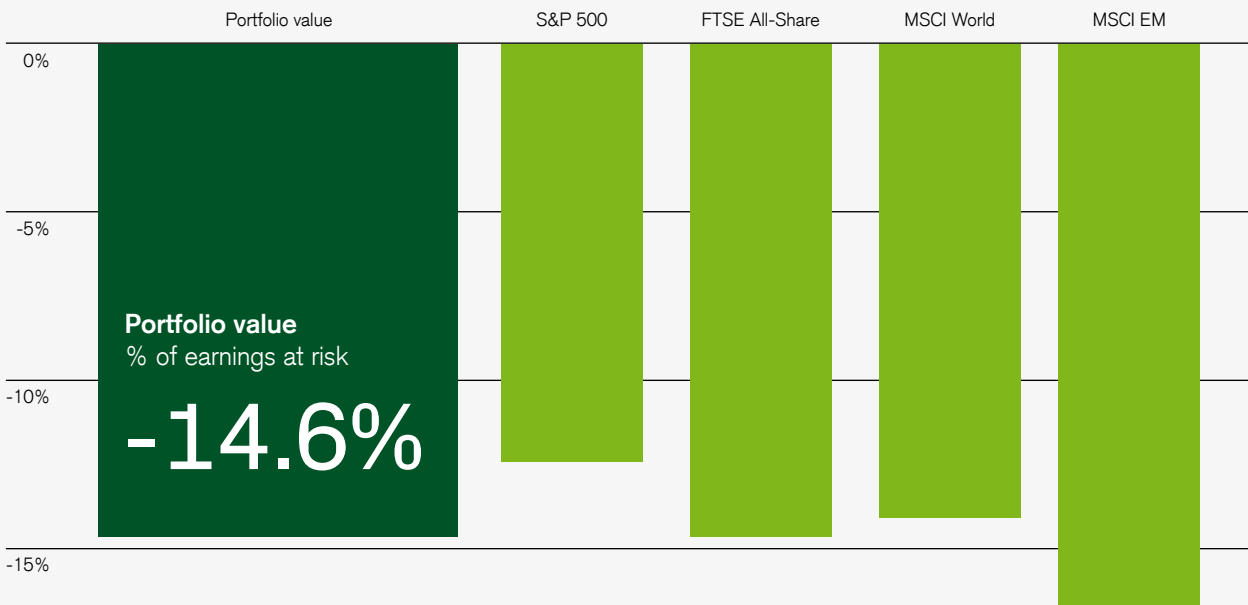
- Regulatory impacts of carbon pricing
- Regulatory intervention leading to increased costs for highly-exposed companies
- Supply chain disruption and damage to production facilities
- Market risks around shifting consumer preferences and civil society activity
- Risks around loss of financing as investors and banks direct capital to climate-aligned companies
- Increased operating, capital and insurance costs
- Risks around rapid, climate-driven technological innovation disrupting entire industries, as we have seen in the electric vehicle and energy sectors.

One of the clearest risks investors face is that of “stranded assets.” A study from the Economist Intelligence Unit estimated that USD 4.2 trillion of assets were at risk from climate change.⁴ Oil companies, for example, have been accelerating write-offs in recent years due in part to government commitments to net zero emissions, and this trend could continue.

How could such risks impact investment portfolios?

Schroders recently analyzed the impact that an increasing price on carbon would have on a hypothetical portfolio, showing that there would be a significant decrease in performance.⁵

Percentage of earnings at risk from rising carbon costs



Source Schroders and Datastream. Schroders portfolio value based on a hypothetical strategy comprising the five largest funds managed by Schroders. Calculated using constituents as of May 2017. For illustrative purposes only.

The “stranded assets” dilemma

We spoke to Mark Campanale, Founder of the Carbon Tracker Initiative,⁶ the organization that coined the term’s association with fossil fuel reserves and infrastructure.

Mark, what are “stranded assets” and how did this term come about?

Stranded assets are those assets whose economic life is cut short or severely curtailed, and they are left “stranded” from a financial perspective. In the carbon context, they are assets that turn out to be worth less than expected, as a result of changes associated with the energy transition.

What would be a potential example?

The example that really caught people’s imagination was the value of oil, gas and coal reserves, which investors need to know in order to stress test the balance sheets of fossil fuel companies. If this volume of fossil fuel were to be burned, the climate would suffer irreversible additional damage, and it is unlikely that society will let that happen. Much of these reserves, which are supporting the share prices of companies, are therefore unlikely to ever be pulled out of the ground, leaving these assets – and all the physical infrastructure supporting their extraction and use – “stranded.”

This puts fossil fuel companies in a difficult position – either they admit that it is inevitable that we will not take action on climate change and are thus on track for a dystopian future, or we will take action and their balance sheets will need to be restated accordingly.

Carbon Tracker’s research finds that if society decides to keep temperature increases within 2°C, a significant proportion of fossil fuels will remain in the ground and the infrastructure supporting their extraction will need to be retired early.

“... it would render the vast majority of reserves “stranded” – oil, gas and coal that will be literally unburnable without expensive carbon capture technology, which itself alters fossil fuel economics.

Mark Carney

former Governor of the Bank of England
on a carbon budget consistent with a 2°C target



Opportunities

There are plentiful opportunities arising from the transition to a low-carbon economy. Several key industries will benefit from this period of transformation.

Green energy and related infrastructure:

The obvious winner from the low-carbon transition will be companies involved in the production of clean energy and its supply chains. This not only involves solar PV and wind generation, but also the industries and infrastructure to support clean energy, from power transmission and batteries/storage to the mineral supply chains required for the transition. Innovation and economies of scale are rapidly driving down the cost of renewable energy, which creates a huge opportunity for consumers and investors. While there is still debate about whether nuclear should be considered “clean,” there is likely to be a role for innovative new modular reactor designs. Hydrogen is also likely to be an important part of the story.

Smart cities and the built environment:

Green buildings will also play an important role. CO₂ emissions from buildings reached an all-time high in 2019. According to the World Green Building Council, all new buildings must operate at net zero carbon from 2030 with all buildings reaching net zero by 2050 in order to meet the goals of the Paris Climate Agreement. However, less than 1% of buildings today are carbon-neutral. There will be tremendous opportunities in energy efficiency in areas such as insulation and efficient lighting of buildings, and green renovation and refurbishment.

Mobility will also be a key driver of lower emissions, with the growing electric vehicle fleet being charged by a grid supplying increasing amounts of renewable energy, along with major investments in public transportation and rail infrastructure. Aviation, trucking and shipping are challenging sectors that will likely see significant opportunities for investment in solutions, such as green hydrogen.

There are also likely to be opportunities in transforming industry. There are large volumes of emissions associated with feedstock for petrochemical products, such as plastics, paints, coatings, fertilizers and pesticides. These are difficult to replace and are ripe for innovation.

Food and agriculture:

The global food system is responsible for 25–30% of global GHG emissions;⁷ forestry and other land use make up 40% of the total emissions, while beef alone accounts for 25% of these emissions. There are likely to be many opportunities in areas such as plant-based and cellular meat, controlled environment agriculture and technologies to dramatically increase the productivity of the world’s least productive farms.

Water and oceans:

Water is a key variable in the climate equation, as climate change is likely to have an impact on water scarcity, and also affect oceans in significant ways. There will be many investment opportunities around water treatment, storm water, irrigation and sanitation infrastructure, and an increased focus on ocean health.

Health and inclusion:

Climate policy is unlikely to succeed unless it is inclusive, and there is an explicit effort to address human needs, particularly among the poorest countries and communities in the world. Investors must ensure that they not only invest in mitigating the worst impacts of climate change on the world’s poor, but also in supporting these communities in adapting to climate change. This can be through investments into health, education, access to finance, agricultural productivity and water and other adaptation infrastructure that can help manage the effects of climate change and ensure these communities are more resilient.



Investing in the climate transition

Water & ocean

- Water technology and infrastructure
- Waste water treatments
- Water and sanitation
- Irrigation
- Ocean conservation

Green energy

- Renewable energy
- Green fuels
- Energy infrastructure and storage

Smart cities

- Green buildings
- Green transportation, e-mobility
- Sustainable infrastructure
- Recycling
- Industry 2.0
- Energy efficiency

Health & inclusion

- Digital health
- Development of new medicines (vaccines, etc.)
- Microfinance
- Insurance

Food & agriculture

- Food technology
- Food storage and conservation
- Land and forest management
- Fertilizers
- Precision agriculture

Source Credit Suisse

Taking a cue from Project Drawdown

Another useful framework for prioritizing solutions to address global warming is provided by Project Drawdown.⁸ Bringing together over 70 research fellows from around the world, Project Drawdown seeks to quantify the potential impact of existing solutions in reaching Draw-down – the point in the future when levels of greenhouse gases in the

atmosphere stop climbing and start to steadily decline. In addition to the above opportunities, Project Draw-down also identified the following areas that can result in significant reductions in emissions, and may provide interesting opportunities for commercial, as well as governmental and philanthropic investment.

- Reduced food waste
- Plant-rich diets
- Tropical forest restoration
- Improved clean cookstoves
- Refrigerant management and alternative refrigerants

Investing in adaptation

Much of the focus around climate change has been on companies that manage climate risk well, are aligned with a low-carbon future or provide solutions to mitigate climate change. However, it is also important to invest in adaptation, as the climate is already changing due to past emissions.

Many investments in adaptation focus on projects that should be pursued anyway: challenges, such as better housing in typhoon-prone developing countries, and infrastructure to address floods and coastal inundation.

As some areas become drier, there will also be opportunities around fire defenses and mitigation, as well as water efficiency, recycling and “green” desalination. There will also be opportunities around changing agricultural practices as some regions become warmer.

These investments are most urgent in developing countries, as these populations are most vulnerable to the impacts of a changing climate, and have less capacity to adapt.

Investing in adaptation can also be seen as a hedge against climate change if policy efforts fail. Effective action on climate change will require coordinated action by hundreds of governments around the world, and significant enhancements in technology across a variety of sectors. If the policy and technology levers are insufficient to keep warming within the 1.5°C to 2°C range, then we will need significantly more investment in adaptation.

Within the sustainable finance space, only 5% of investments focus on adaptation, which is arguably too little, given the human cost of extreme weather and other climate-related impacts.

Green companies as investment opportunities

According to data compiled by Bloomberg New Energy Finance, clean companies (with at least 10% of their revenues derived from clean energy, energy efficiency or clean technology) delivered significantly higher returns in 2019 compared with almost all of the world's leading equity indexes.

Over ten years, clean companies tripled their market capitalization, reaching USD 946 billion by the end of 2019. In comparison, fossil fuel companies (the S&P Energy Index) showed declines of 5% in 2019. Investing in clean companies therefore proves its capacity to generate higher returns with

similar risks (i.e. volatility) to that of the traditional market.⁹ Furthermore, 2020 was also a very strong year for clean companies, with the two top-performing equity funds in the USA in 2020 focusing on clean energy.¹⁰

Perspectives on climate-focused investments

“Businesses should seize a USD 6 trillion opportunity to invest in tackling climate change over the next two decades.”

Source SMH, 2018

“Stocks best positioned to benefit from climate change policy returned 78% YTD as of Sept. 2020.”

Source Forbes, 2020

“Green companies show that climate change is also a business opportunity by their stock performance.”

Source Bloomberg, 2020

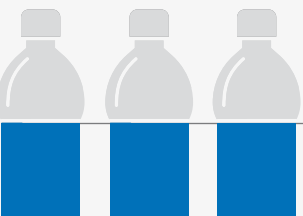
“The majority of global fund managers believe that climate change will be the outperforming environmental, social, and governance (ESG) theme over the next 12 months.”

Source Investment Centre by Money Management, 2020

Growing up: Outlook for green investment

+ 14.8%

Expected market growth for smart cities in the next five years.

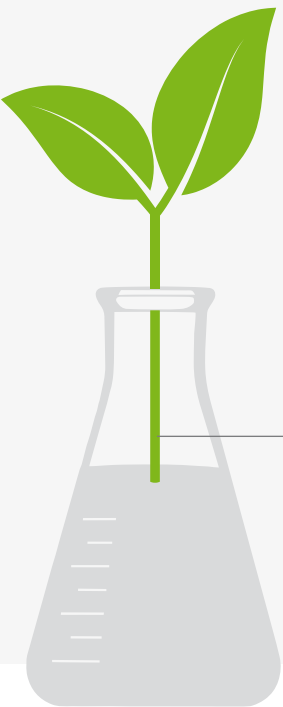


USD 211,300,000,000

Expected size of the water and waste water treatment market by 2025, with a compound annual growth rate (CAGR) of 6.5%.

USD 29,900,000,000

Investment in offshore wind hit a high in 2019, up 19% from the prior year.



USD 52,000,000,000

Potential size of the agricultural biotech market by 2026, with an 11% CAGR.

Sources Markets and Markets, Research and Markets, Frankfurt School, Meticulous Market Research

Top 10 climate innovations for the 2020s

While regulation and policy are important, we can only achieve a low-carbon future globally if sustainable energy sources are cheaper and more reliable than fossil fuels. While the cost of renewable energy has come down dramatically over the last decade, in many parts of the economy, as well as regions in the world, there is still some way to go before renewables can replace fossil fuels. There needs to be investments at massive scale in R&D and early-stage technology companies in order to reach climate goals.

So what technologies could play an important role in decarbonizing the economy over the next ten years? We brainstormed this question with two leading practitioners in climate innovation – Temple Fennell from Clean Energy Ventures and Ted Wiley from Form Energy.

Green hydrogen

Innovation around hydrogen solutions is among the most promising low-carbon technologies. Because renewables are intermittent and sometimes overproduce, hydrogen manufacture can take excess electricity when it is cheap and available. Green hydrogen could also be the fuel of the future for the trucking and shipping industries, and a key ingredient in the manufacture of sustainable aviation fuel, one of the most challenging fuels to replace.

New frontiers in solar

Prices of solar PV have come down dramatically over recent years to the point that it is – leaving aside intermittency – the cheapest form of new build electricity generation. The emergence of multi-junction/tandem solar cells can improve efficiency from an average of 20% to above 30%, while modular designs will reduce installation costs. Thin film and flexible solar panels will allow for better integration into buildings. Semi-shaded agriculture under panels could enhance agricultural yields.

Small modular reactors (SMRs)

These newly designed nuclear reactors are pre-fabricated in factories, allowing for greater economies of scale and efficiencies in production. They use molten salts to store and then release additional heat on demand, allowing the facility to vary output based on demand. Thorium, the element used in some of these new designs, also produces little nuclear waste.

Controlled environment agriculture

Indoor vertical farming under lights is gaining considerable attention and investment, and this is likely to continue. High-tech greenhouses can also offer much of the productivity of vertical farming while still leveraging natural sunlight. In general, agriculture is ripe for significant productivity improvements, particularly in developing countries, which will take pressure off forests, and allow farmers to grow more food on less land.

New frontiers in wind

There will continue to be increases in the size and efficiency of turbines. Given onshore capacity constraints, offshore wind is likely to see major growth. Floating turbines are still expensive, but given the virtually unlimited potential for this technology, there will surely be further innovation.

Plant-based and cellular meat

Alternative meat has the potential to dramatically improve the carbon footprint of food. We have already seen tremendous progress in this field with high-profile IPOs, and this momentum is likely to continue.

Carbon-neutral cement

Cement is a heavy emitter. There is a lot of R&D going into cement that can capture rather than emit CO₂ during its production.

Electric vehicles

Electrification of vehicles is already a high-profile sector, though it still has a long way to go. Cheaper and more efficient electric vehicles will be launched, and will likely be grid integrated and play a role in distributed storage or electricity.

Upgraded grids

Innovation around better directing the flow of electricity, advanced switching, storage and optimization. New grid design to optimize grids and local storage. High voltage direct current (HVDC) power transmission, which sends power across continents with little loss, can play an important role in linking up and smoothing out intermittent power generation across continents.

Long duration, utility scale batteries

Large batteries are under development that could be significantly cheaper than existing solutions. They can potentially store electricity from solar and wind generation for up to 150 hours, and discharge it consistently into the grid as baseload power, addressing one of the main challenges for intermittent energy production.

How investors are responding

Investors are addressing climate risks and opportunities within their portfolios through a range of different approaches. While large fund managers and family offices can address these issues in-house, private wealth clients can engage with their wealth managers on how to transition their portfolios to align with a low-carbon future.

1

Assessing the portfolio

The first step in understanding the risk associated with climate change in portfolios is to assess the carbon exposure and transition preparedness – that is, to what extent is the portfolio exposed to risks associated with the climate transition, and to what degree are its underlying companies aligned with the goal of keeping warming within 1.5°C or 2°C.

Carbon footprint – the weighted average carbon emissions of the underlying companies in the portfolio – has been the most common tool used over the last 15 years to give investors a sense of the exposure their portfolio has to carbon. Investors can compare the footprint of their portfolio with that of the reference benchmark, and this can give a rough estimate of the impact to the portfolio of, for example, an across-the-board increase in the price of carbon. However, there are some significant limitations with simply assessing the backward-looking emissions of the companies in a portfolio, and these will be discussed further.

Additionally, there is now a range of more sophisticated, forward-looking methodologies that take a more holistic view of a portfolio's preparedness for the carbon transition, recognizing that the company's own emissions are only part of the story. For example, some companies and entire sectors will be highly disrupted as the economy transforms, and this may be independent of the emissions of the companies involved. And some sectors, such as the supply chains for wind turbine and solar PV manufacture, generate significant emissions at the company level, yet are likely to benefit considerably from the climate transition.

Both carbon footprinting and the more forward-looking carbon transition/preparedness methodologies involve relative scores that indicate how a portfolio compares with a reference benchmark. However, the climate challenge requires absolute emission reductions, and recent methodologies seek to assess the degree to which a portfolio and the trajectory of its underlying companies are aligned with a 1.5°C or 2°C future.

2

Reducing a portfolio's carbon intensity

Once an investor has undertaken the assessment above and identified companies that may face significant risks from a climate transition, they can start with swapping out some of the laggard companies for lower-emitting or more climate-aligned securities. For example, the bonds of a climate laggard company could be swapped out for green bonds with a similar credit rating, and high-carbon emitting equities for lower-emitting companies in the same sector. There are now low-carbon substitutes for almost all asset classes in a typical portfolio that can dramatically lower the carbon footprint while retaining a similar risk/return profile.

While many investors start with substitutes that serve the same or similar investment function, if a portfolio is to be aligned with a 1.5°C scenario, there will ultimately be a need to significantly reduce overall emissions, and this may have implications for sector weightings and biases that would need to be considered over time.

Many climate-aware investors are increasingly choosing to simply exclude an entire class of heavy emitters that will likely have a limited future under any low-carbon scenario, such as coal mining and thermal coal power generation.

Actions investors can take:

- Swap out climate laggards with climate leaders.
- Swap out traditional funds with funds with high scores on climate preparedness and alignment with climate goals.

Such efforts include the Science Based Targets Initiative (SBTi)¹¹, the Paris Agreement Capital Transition Assessment (PACTA)¹² and the Transition Pathway Initiative (TPI)¹³, which provide frameworks for companies and investors to assess their degree of alignment with a 1.5°C warming scenario, and set net zero emissions targets that, if broadly adopted, would keep the world within such a scenario.

Actions investors can take:

- Compare the carbon footprint of your portfolio with that of a reference benchmark.
- Evaluate the forward-looking carbon preparedness of the portfolio through, for example, carbon transition scores.
- Assess the degree to which the portfolio is aligned with 1.5°C or 2°C future, and what would need to be done to bring it in line with that goal.
- Identify the laggard companies based on the methodologies above and find opportunities for switching.

3

Integrating climate risk into investment processes

Given the likely scale of the climate transition and the disruption that will come, fund managers are now looking into where value may be at risk within portfolios based on varying climate scenarios. Each sector in each country faces unique challenges. Different jurisdictions will increase the price on carbon at different times and rates. And different companies may have different exposures to climate change: for example, operating facilities in coastal areas may face higher risks of extreme weather events. And technological disruption will affect different sectors at different stages. Some companies, which may be heavy emitters, may actually produce products that facilitate the low-carbon transition and will benefit from an increased price of carbon.

Sophisticated investors recognize that climate change is a material issue for business, but different companies, sectors and regions will be affected differently, and these factors need to be assessed at a granular level, not with blanket generalizations.

Company reputations are also an important asset that should not be underestimated. The new generation of responsible consumers and non-governmental organizations are paying a lot of attention to climate change, and companies that are perceived to be misaligned with society's climate goals will likely face significant reputational risks that could result in declining sales and market share.

Actions investors can take:

- Assess fund managers for the extent to which they are integrating climate transition into fundamental analysis, and how they could outperform based on material risk and opportunity.
- Swap out traditional strategies for those that are integrating material climate factors into investment processes.

4

Shifting into companies providing climate solutions

Simply shifting out of high emitters into climate-aligned companies, however, does not solve climate change. Investors need to direct capital toward solutions as well. There are now countless opportunities to invest in climate solutions, with many fund managers offering clients exposure to the latest climate technologies and innovations, as well as infrastructure investments and climate-aligned leaders within traditional industries. Investments in such companies can be through liquid strategies (thematic and impact-aligned investments) and illiquid strategies (impact investments). Illiquid investments in climate solutions tend to be the most impactful, as investors directly finance the growth of companies rather than simply purchasing securities in secondary markets.

However, companies and funds focused on solutions (especially in the earlier stages) are often at the higher-risk, higher-conviction end of the spectrum, and tend to be concentrated in a smaller number of sectors and thus lack diversification. They are often placed in a "satellite" allocation as opposed to the "core" portfolio. However, as climate solutions become more mainstream and these companies grow in size and maturity, they are increasingly becoming part of investors' core portfolios.

It is also important to include adaptation – not just mitigation – in the climate solutions bucket. This would then bring in a broader range of investments (such as climate-aware agriculture, and flood mitigation/water infrastructure), and allow for a more diversified and lower-risk allocation to climate solutions.

Actions investors can take:

- Shift part of the portfolio into climate solutions, both in liquid and illiquid asset classes.
- Explore adaptation investments to balance the more tech- and renewables-focused solutions investments.

Explaining emissions

Climate-proofing your portfolio

An important concept to understand when decarbonizing your investment portfolio is the different types of emissions that a company (and its investors) are generating, and what investors might do about them.

Scope 1 emissions

are generated by the company directly from sources such as burning of fuels (stationary or mobile), industrial processes, land use changes, etc.

Scope 2 emissions

are primarily those associated with the electricity consumed by the company.

Scope 3 emissions

are all other emissions associated with the company's operations, such as business travel, waste generated and products, both upstream (in the supply chain) and downstream (use of the products and end of life). Scope 3 emissions typically account for the largest proportion of a company's emissions.

Most company emissions data focuses on scope 1 and 2, though it is beginning to include scope 3 emissions, which are more challenging to collect.

There are many companies whose scope 1, 2 and 3 emissions are high, but they produce products that are necessary for decarbonizing the economy. For example, the electrification of the vehicle fleet and the upgrading of electricity grids will require vast amounts of copper. And wind turbine manufac-

turers are likely to be responsible for significant emissions across all scopes. It is therefore important that investors incorporate other metrics such as the proportion of revenues that a company generates from green products, or the number of patents for low-carbon technologies filed by a company.

Source Credit Suisse

Beyond carbon footprinting

We spoke to Lombard Odier Investment Managers on developments in the carbon assessment of portfolios.

What is carbon footprinting, and what are its limitations?

Carbon footprinting gives a snapshot of the carbon emissions of the underlying companies. This is a measurement of what your portfolio is emitting versus revenues. This is useful for people who want to see how they can reduce the carbon exposure of a portfolio and put it on a trajectory that would be aligned with the Paris climate agreement targets. However, it is most easily achieved through exclusion strategies, e.g. the removal of coal and other fossil fuels from portfolios. However, we will still need oil and steel for some time to come. We still need to finance companies in polluting sectors, but shift support to the companies that are moving toward sustainable practices and products. We should invest in companies that are aligning their business models toward the Paris agreement and reducing their emissions, even if they remain heavy emitters for now. That is why we look at the temperature alignment of companies.

What is “temperature alignment” and how does it differ from the carbon footprint?

Many currently available metrics evaluate companies’ carbon footprint based on direct emissions (scope 1). In our opinion such metrics do not take into account two very important factors: the indirect and/or avoided emissions linked to a company’s entire value chain (scope 2 and 3), and the speed of improvements made by companies over time to reduce emissions. Because these dimensions are vital to properly identifying the companies that are truly decarbonizing, we developed a temperature alignment model in partnership with SYSTEMIQ and the University of Oxford. The model takes into account these two additional dimensions and allows for the evaluation of entire portfolios according to the degree to which they are aligned with the Paris agreement, considering scope 1, 2 and 3 emissions vs. a given benchmark, and a portfolio’s climate trajectory until 2050.

“ We should invest in companies that are aligning their business models toward the Paris agreement.



A time for action

Decarbonizing your portfolio is not the same as building a portfolio that helps to decarbonize the world. While investors should seek to do both, these goals can come into conflict. For example, a wind turbine manufacturer may have a high carbon footprint because of the materials and processes involved in the manufacture of turbines, yet it is directly contributing to the creation of a low-carbon future. In addition, simply buying shares of a low-carbon company in a sector such as media is unlikely to make a measurable contribution to addressing climate change.

It is therefore important that investors not only consider how to reduce exposure to carbon in their portfolios and ensure their portfolios are aligned with a low-carbon future, but also explore whether their portfolios are actually contributing to solving the climate challenge. And for a portion of the portfolio, how might capital be put to work to make a measurable difference?

Much of the discussion within sustainable investing has been focused at the company level: are the companies at risk from or contributing to a low-carbon future? However, investors also need to explore the impact of different investment strategies and how these can further enhance the positive impact of companies. How can investors create impact? In which stages of a company's lifecycle is investment most impactful? How can investors add value to the company in terms of additional impact during the investment period (for example through active ownership)?

Investors have the greatest impact when they help fund the growth of impactful companies where that capital is additive or additional, as is often the case with innovative early-stage companies, or companies and projects in developing countries (where capital is scarce and expensive).

This is especially important with climate change, as significant innovation will be required to develop the technologies needed to decarbonize the economy in a way that is affordable and can be adopted globally – even in countries where there is little policy support for action on climate change. Investors can also be highly impactful when they are active owners, and influence companies through shareholder engagement, joining boards, becoming trusted advisors to the company management, or by exercising shareholder voting rights, resulting in a greater climate alignment by the company.

In order to create maximum impact within the high-impact portion of the portfolio, investors should, at least for part of the portfolio, focus on:

- Financing climate solutions in private market strategies that use concrete metrics to measure the climate impact in asset classes such as venture capital, private equity, private debt, green real estate and unlisted infrastructure.
- Support fund managers that are active owners and have robust programs to directly engage with companies to address climate change, and support shareholder proposals filed by other investors calling for climate action.

Active ownership and climate change

One of the fastest-growing approaches to addressing the climate transition for fund managers and pension funds is through active ownership – that is, shareholder engagement and the filing of shareholder proposals at annual general meetings (AGMs) of shareholders (also known as shareholder activism). Engagement is where the shareholder uses its power and influence to engage directly with companies to take action on climate change, most often backed by a strong business case for doing so. If dialogue is ineffective, the shareholder may file a resolution at the company AGM, and ask other shareholders to support a call for the company to address an issue.

Shareholder activism is also a fast-growing form of active ownership in response to climate change. There were over 140 climate-related shareholder proposals put to company AGMs in 2020, with majority votes achieved with a

number of these resolutions. For example, 53% of the shareholders of Chevron voted in favor of the company aligning its political lobbying activities with the Paris climate targets.¹⁴

Active ownership is the only direct mechanism of impact in liquid markets, as it can result in management changing course and transitioning to lower-carbon strategies. Many investors simply buy securities from other investors in liquid secondary markets, and the signals sent to companies are weak. Direct shareholder engagement with companies can deliver real impact and has a decades-long track-record of doing so.

Climate Action 100+

Launched in December 2017, Climate Action 100+ is the largest investor-led collaborative shareholder engagement initiative, with 450 investor signatories representing USD 40 trillion in assets.¹⁵ This shareholder engagement coalition targets 161 companies representing around 80% of emissions, operating across multiple sectors. These investors engage with investee companies to encourage action to curb emissions, strengthen climate-related financial disclosures and improve governance of climate change issues. They also file share-

holder proposals asking for concrete climate strategies, including the linking of executive pay to emissions reductions. Examples of successful engagements include BP agreeing to disclose how its capital expenditures, emission policies and broader strategy align with the Paris agreement after months of engagement with investors in early 2019. BP separately agreed to link the remuneration of 36,000 employees to GHG emission reduction targets.

Credit Suisse is an active member of Climate Action 100+.

Addressing food waste

Reducing food loss and waste contributes directly to several UN SDGs: 2 (zero hunger); 12 (responsible consumption and production); 13 (climate action); and potentially 15 (life on land) – as we will need less land for agriculture if we can avoid food waste. Given that much food loss and waste occurs within the supply chains of listed companies, investors in liquid equities are well positioned to engage on this issue and make a difference.

Looking at Credit Suisse's approach to this issue, we identify sectors/sub-industries such as retail/groceries, restaurant chains and hotels and assess the most effective steps that companies can take to address this issue. We start the engagement with desktop research on companies and industry best practice, then send companies a questionnaire to get a better sense of what they are already doing on this issue. We engage in a dialogue with the companies to highlight the business case for addressing the issue, industry best practice and relevant partners or consultants that may be helpful for implementation. At the beginning of each engagement with a company, we set milestones for company change, and then monitor progress in achieving those milestones over a 12 to 24 month period. We also help companies establish key performance indicators for these issues and encourage them to issue public reports on their progress as part of their annual sustainability reporting cycle.

Credit Suisse is committed to creating as much positive impact as possible, while delivering superior returns to clients. We recognize that within listed markets, shareholder engagement is the key mechanism for impact, and look forward to building our engagement effectiveness over time.



The sustainable asset class universe

For investors looking to create a sustainable portfolio for a low-carbon future, the guide below provides an overview of the opportunities across asset classes.

EQUITIES

Climate-aligned single stocks portfolios: Earlier sections describe how investors can ensure their portfolio of stocks is climate aligned. Most portfolios of stocks can be made “climate ready” without dramatically affecting the overall risk/return profile. Single stock (and bond) portfolios can be used to offer exposure to an investor’s home market, as many sustainable funds are global and country-specific options are limited.

ESG integration equities: These are typically actively managed funds seeking outperformance by integrating material ESG risks and opportunities. There are also some passive ESG-integrated ETFs. They often use their shareholder influence to encourage companies to address climate risks. Investors into these funds should determine how sophisticated these integration and active ownership approaches are, as there are large differences between the leaders and those that are at earlier stages of their climate journey.

Sustainable thematic equities: This is where clients gain exposure to sustainable and climate-related themes, such as clean energy, water and sustainable agriculture. These funds invest in solutions companies in liquid markets, providing exposure to these fast-growing themes. They also include thematic funds focused on human dimensions such as health and education.

Engagement equities: There are a small subset of equity funds that focus on delivering impact through shareholder engagement. While some climate-focused equity funds invest in companies that score well on various climate metrics, engagement funds seek to deliver

improvement in these metrics via shareholder engagement and tend to invest in companies that may be lower on the climate performance spectrum.

FIXED INCOME

Allocations for single bonds, like single equities, can be screened for high-emitters and companies that are not aligned with a low-carbon economy.

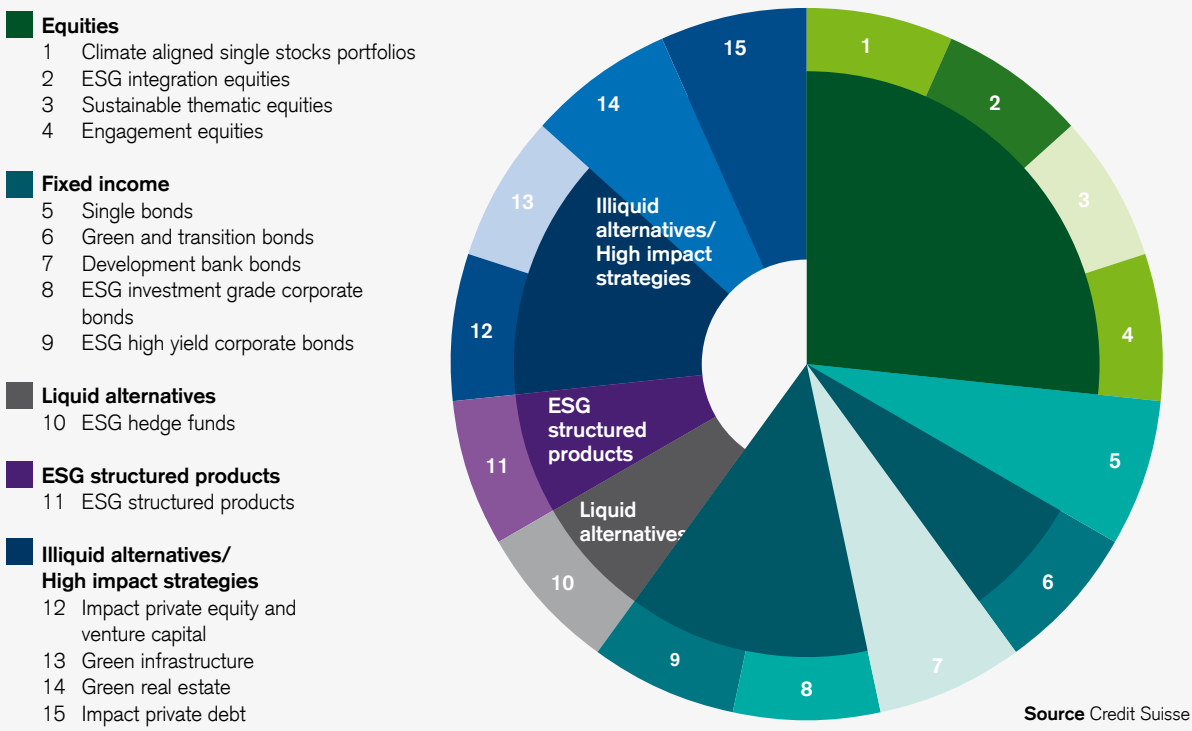
Green and transition bonds: Green bonds are issued by companies or municipalities against their own balance sheets to fund green infrastructure. Transition bonds are similar, but are issued by industries with high GHG emissions for them to finance their transition to lower-carbon strategies.

Development bank bonds: These are typically issued by multilateral development banks, and often come with a AAA rating. They are a simple replacement for sovereign bonds and often fund climate-related infrastructure in developing countries.

ESG investment grade corporate bonds: These make up the bulk of sustainable bonds on the market, and are issued by companies with high ESG ratings. Like equities, ESG bond funds vary in their consideration of climate preparedness, and investors should look carefully at their methodologies to ensure that climate is being integrated in a robust way.

ESG high yield corporate bonds: These are the ESG-aligned subset of the high-yield bond universe. Given the risk of these bonds, these strategies often integrate ESG factors into their risk analyses. They may also finance solutions companies.

Asset allocation for a model low-carbon portfolio



LIQUID ALTERNATIVES

ESG hedge funds: This is a relatively new asset class that offers clients the opportunity not just to go long on the ESG and climate leaders, but also to short the laggards and benefit from the inevitable disruption that will come with the climate transition. There are only a few such strategies in the market, but as it becomes clearer which sectors and companies will be the winners and losers from the climate transition, it is likely that there will be more.

ESG STRUCTURED PRODUCTS

These allow investors to gain exposure to asset classes that are usually difficult to source for themselves. They involve repackaging risk from, for example, an illiquid, inefficient format to one that meets clients’ goals and investment criteria. For example, getting exposure to small renewable energy loans in Africa would be uneconomic to source and monitor for an institutional investor, but a bank can repackage these into a security.

ILLIQUID ALTERNATIVES/ HIGH IMPACT STRATEGIES

Impact private equity and venture capital: This is one of the fastest growing and most exciting areas of the climate space from a direct impact perspective. This is where clients get exposure to high-impact venture capital strategies in the technologies mentioned earlier.

Green infrastructure: A large proportion of private market investment into climate solutions is going into renewable energy infrastructure. Traditional infrastructure managers are also taking climate risk into account and working with the investee projects to reduce emissions and implement adaptation plans.

Green real estate: Real estate is one of the most important asset classes when it comes to reducing carbon emissions, as the sector is such a large contributor. Green property funds are able to significantly reduce emissions of buildings, both in new-build properties but also through the refurbishment of old buildings, focusing on energy efficiency measures and the use of renewable energy sources.

Impact private debt: There are many opportunities to invest in private debt in climate-related businesses. Microfinance can also be considered a climate-focused investment, as developing country communities are often the hardest hit by, for example, increasingly severe weather events.

Building it better

As stated earlier, many clients begin with the portfolio they have, and over time replace the less climate-aligned investments with those that are more climate aligned, so that they can keep the risk/return profile of the portfolio relatively consistent.

However, as clients understand more about the climate challenge, many seek to build a portfolio where all of the parts are climate aligned. If such a client were to put together a portfolio from the ground up, what are some of the considerations he or she may take into account when constructing it?

Given that most asset classes now offer sustainable/ESG (and often climate-aligned) options, clients can simply construct a portfolio along the lines of a traditional one, using traditional benchmarks. However, some clients recognize that a climate-aligned portfolio will likely result in sector biases with little exposure to high-emitting sectors, in which case ESG benchmarks may be more appropriate.

Different clients will also have different preferences in terms of expected return, appetite for risk, liquidity requirements and degree of intended impact for different parts of the portfolio. While a typical diversified portfolio would contain elements of all of the described on the following page, some clients may choose to focus on key attributes, based on their own preferences.

High return/income allocation

Like traditional portfolios, clients seeking high returns would overweight components such as:

- ESG integration equities
- Engagement equities
- Sustainable thematic equities
- Private equity and venture capital
- Climate-focused hedge funds could also play a role in such an allocation

High liquidity allocation

Many clients only invest in liquid strategies, including most retail investors and those who are not classified as professional or “qualified” investors. In terms of options, the great majority of sustainable funds are indeed liquid. While most equity and fixed income funds offer daily liquidity, there are some strategies, such as open-ended green real estate, microfinance and hedge funds that can be semi-liquid. Microfinance, for example, is available with bi-monthly liquidity and is open to retail investors. Microfinance is also classified as an impact investment, as it directly finances loans to the world's lowest income entrepreneurs.

One downside of liquidity in the context of constructing a climate-focused portfolio is that most of the highly impactful strategies are within illiquid alternatives, as they tend to directly finance projects or the growth of early stage companies. Therefore, in order to deliver real impact in a liquid portfolio, in addition to microfinance, there needs to be a strong focus on equity funds that undertake robust shareholder engagement.

Low risk allocation

To reduce risk in the portfolio, a client would invest in bonds and other lower-risk strategies:

- Fixed income climate-aligned strategies outlined above
- The lower-risk illiquid alternatives such as impact private debt and de-risked green infrastructure. There is a debate about the risk profile of microfinance – while it is in private markets and comes with the risk associated with small fund managers and emerging markets, most microfinance fund managers have demonstrated relatively low volatility over the last two decades.

High impact allocation

As outlined above, if an investor would like to maximize their direct and measurable impact on the climate, they would focus on:

- Illiquid alternatives such as private equity/debt, venture capital, green real estate and infrastructure, and in particular funds that have robust impact management and measurement.
- Equity funds that undertake shareholder engagement, and report on the impacts of their engagement.

Impact investing, and the way in which investors can use their capital to deliver measurable impact through capital allocation and active ownership, is a key element of the climate investment story, and it is important that clients understand how best to deliver direct and measurable impact in their portfolios.

Conclusion

Climate change is one of the key risks facing investors and the economy over coming decades. It also brings with it tremendous opportunities.

This publication has set out a high-level strategy around leveraging these risks and opportunities and constructing a sustainable and impactful portfolio that is aligned with a low-carbon future. Such a portfolio can now be constructed using institutional quality strategies across almost all asset classes and investment approaches, and using both liquid and illiquid investments. It should be able to deliver comparable and potentially superior risk-adjusted returns to a traditional portfolio.

However, investors should not only focus on avoiding risks and seeking investment opportunities relating to the disruption that comes with transitioning to a low-carbon economy. They can also play a role in helping to drive this transition, as their capital can speed up the transformation of industries and sectors, and support regulatory and consumer trends. In order to do this, investors need to – at least for part of their portfolios – focus on impact. This is achieved primarily through financing companies and projects in private markets and through active ownership (e.g. shareholder engagement, voting) in public markets.

A portfolio approach that takes into account all of these considerations should not only be able to reduce its own exposure to carbon risk, but also help to drive the carbon transition.

We hope this publication has provided a framework for how such a portfolio can deliver not only attractive financial returns, but also contribute to solving one of the most challenging problems facing society.



Imprint

Lead author

James Gifford

Additional author

Alexandra Stettler

Contributor

Marisa Drew

Editorial support

Catherine McLean Trachsler

Polly Ribet

Project management

Camilla Damm Leuzinger

Claudia Biri

Editorial deadline

09 February 2021

Translations

Credit Suisse Language & Translation Services

Design

LINE Communications AG

References

¹ <http://www.gsi-alliance.org/>

² Credit Suisse 2020, Cleantech, collaboration, and climate action: driving the clean energy transition through COVID-19

³ https://www.ipcc.ch/site/assets/uploads/2018/02/WGIAR5-Chap11_FINAL.pdf

⁴ "The cost of inaction", Economist Intelligence Unit, July 2015, © 2015 The Economist Intelligence Unit Limited

⁵ <https://www.schroders.com/en/ch/asset-management/themes/climate-change-dashboard/carbon-var>

⁶ <https://carbontracker.org/terms/stranded-assets>

⁷ According to the Intergovernmental Panel on Climate Change (IPCC)

⁸ <https://drawdown.org/>

⁹ <https://www.bloomberg.com/opinion/articles/2020-01-13/tech-companies-fighting-climate-change-outperform-stock-market>

¹⁰ <https://www.ft.com/content/cad6fcf9-f755-4988-9c75-d41a9b6ff6d8>

¹¹ <https://sciencebasedtargets.org>

¹² <https://2degrees-investing.org/topic/pacta>

¹³ <https://www.transitionpathwayinitiative.org>

¹⁴ <https://www.greenbiz.com/article/how-climate-proposals-fared-during-2020-proxy-season>

¹⁵ <https://www.climateaction100.org>



Important information

This report represents the views of the Investment Strategy Department of CS and has not been prepared in accordance with the legal requirements designed to promote the independence of investment research. It is not a product of the Credit Suisse Research Department even if it references published research recommendations. CS has policies in place to manage conflicts of interest including policies relating to dealing ahead of the dissemination of investment research. These policies do not apply to the views of Investment Strategists contained in this report.

Risk warning

Every investment involves risk, especially with regard to fluctuations in value and return. If an investment is denominated in a currency other than your base currency, changes in the rate of exchange may have an adverse effect on value, price or income.

For a discussion of the risks of investing in the securities mentioned in this document, please refer to the following Internet link: <https://investment.credit-suisse.com/gr/riskdisclosure/>

This document may include information on investments that involve special risks. You should seek the advice of your independent financial advisor prior to taking any investment decisions based on this document or for any necessary explanation of its contents. Further information is also available in the information brochure "Risks Involved in Trading Financial Instruments" available from the Swiss Bankers Association.

Past performance is not an indicator of future performance. Performance can be affected by commissions, fees or other charges as well as exchange rate fluctuations.

Financial market risks

Historical returns and financial market scenarios are no reliable indicators of future performance. The price and value of investments mentioned and any income that might accrue could fall or rise or fluctuate. You should consult with such advisor(s) as you consider necessary to assist you in making these determinations.

Investments may have no public market or only a restricted secondary market. Where a secondary market exists, it is not possible to predict the price at which investments will trade in the market or whether such market will be liquid or illiquid.

Emerging markets

Private Equity (hereafter "PE") means private equity capital investment in companies that are not traded publicly (i.e. are not listed on a stock exchange), they are complex, usually illiquid and long-lasting. Investments in a PE fund generally involve a significant degree of financial and/or business risk. Investments in PE funds are not principal-protected nor guaranteed. Investors will be required to meet capital calls of investments over an extended period of time. Failure to do so may traditionally result in the forfeiture of a portion or the entirety of the capital account, forego any future income or gains on investments made prior to such default and among other things, lose any rights to participate in future investments or forced to sell their investments at a very low price, much lower than secondary market valuations. Companies or funds may be highly leveraged and therefore may be more sensitive to adverse business and/or financial developments or economic factors. Such investments may face intense competition, changing business or economic conditions or other developments that may adversely affect their performance.

Alternative investments

Hedge funds are not subject to the numerous investor protection regulations that apply to regulated authorized collective investments and hedge fund managers are largely unregulated. Hedge funds are not limited to any particular investment discipline or trading strategy, and seek to profit in all kinds of markets by using leverage, derivatives, and complex speculative investment strategies that may increase the risk of investment loss.

Commodity transactions carry a high degree of risk, including the loss of the entire investment, and may not be suitable for many private investors. The performance of such investments depends on unpredictable factors such as natural catastrophes, climate influences, hauling capacities, political unrest, seasonal fluctuations and strong influences of rolling-forward, particularly in futures and indices.

Investors in real estate are exposed to liquidity, foreign currency and other risks, including cyclical risk, rental and local market risk as well as environmental risk, and changes to the legal situation.

Private Equity

Private Equity (hereafter "PE") means private equity capital investment in companies that are not traded publicly (i.e. are not listed on a stock exchange), they are complex, usually illiquid and long-lasting. Investments in a PE fund generally involve a significant degree of financial and/or business risk. Investments in private equity funds are not principal-protected nor guaranteed. Investors will be required to meet capital calls of investments over an extended period of time. Failure to do so may traditionally result in the forfeiture of a portion or the entirety of the capital account, forego any future income or gains on investments made prior to such default and among other things, lose any rights to participate in future investments or forced to sell their investments at a very low price, much lower than secondary market valuations. Companies or funds may be highly leveraged and therefore may be more sensitive to adverse business and/or financial developments or economic factors. Such investments may face intense competition, changing business or economic conditions or other developments that may adversely affect their performance.

Interest rate and credit risks

The retention of value of a bond is dependent on the creditworthiness of the Issuer and/or Guarantor (as applicable), which may change over the term of the bond. In the event of default by the Issuer and/or Guarantor of the bond, the bond or any income derived from it is not guaranteed and you may get back none of, or less than, what was originally invested.

Investment Strategy Department

Investment Strategists are responsible for multi-asset class strategy formation and subsequent implementation in CS's discretionary and advisory businesses. If shown, Model Portfolios are provided for illustrative purposes only. Your asset allocation, portfolio weightings and performance may look significantly different based on your particular circumstances and risk tolerance. Opinions and views of Investment Strategists may be different from those expressed by other Departments at CS. Investment Strategist views may change at any time without notice and with no obligation to update. CS is under no obligation to ensure that such updates are brought to your attention.

From time to time, Investment Strategists may reference previously published Research articles, including recommendations and rating changes collated in the form of lists. The recommendations contained herein are extracts and/or references to previously published recommendations by Credit Suisse Research. For equities, this relates to the respective Company Note or Company Summary of the issuer. Recommendations for bonds can be found within the respective Research Alert (bonds) publication or Institutional Research Flash/Alert – Credit Update Switzerland. These items are available on request or from <https://investment.credit-suisse.com>. Disclosures are available from www.credit-suisse.com/disclosure.

Global disclaimer/Important Information

The information provided herein constitutes marketing material; it is not investment research.

This document is not directed to, or intended for distribution to or use by, any person or entity who is a citizen or resident of or located in any locality, state, country or other jurisdiction where such distribution, publication, availability or use would be contrary to law or regulation or which would subject CS to any registration or licensing requirement within such jurisdiction.

References in this document to CS include Credit Suisse AG, the Swiss bank, its subsidiaries and affiliates. For more information on our structure, please use the following link: <http://www.credit-suisse.com>

NO DISTRIBUTION, SOLICITATION, OR ADVICE: This document is provided for information and illustrative purposes and is intended for your use only. It is not a solicitation, offer or recommendation to buy or sell any security or other financial instrument. Any information including facts, opinions or quotations, may be condensed or summarized and is expressed as of the date of writing. The information contained in this document has been provided as a general market commentary only and does not constitute any form of regulated investment research financial advice, legal, tax or other regulated service. It does not take into account the financial objectives, situation or needs of any persons, which are necessary considerations before making any investment decision. You should seek the advice of your independent financial advisor prior to taking any investment decisions based on this document or for any necessary explanation of its contents. This document is intended only to provide observations and views of CS at the date of writing, regardless of the date on which you receive or access the information. Observations and views contained in this document may be different from those expressed by other Departments at CS and may change at any time without notice and with no obligation to update. CS is under no obligation to ensure that such updates are brought to your attention. **FORECASTS & ESTIMATES:** Past performance should not be taken as an indication or guarantee of future performance, and no representation or warranty, express or implied, is made regarding future performance. To the extent that this document contains statements about future performance, such statements are forward looking and subject to a number of risks and uncertainties. Unless indicated to the contrary, all figures are unaudited. All valuations mentioned herein are subject to CS valuation policies and procedures. **CONFLICTS:** CS reserves the right to remedy any errors that may be present in this document. CS, its affiliates and/or their employees may have a position or holding, or other material interest or effect transactions in any securities mentioned or options thereon, or other investments related thereto and from time to time may add to or dispose of such investments. CS may be providing, or have provided within the previous 12 months, significant advice or investment services in relation to the investments listed in this document or a related investment to any company or issuer mentioned. Some investments referred to in this document will be offered by a single entity or an associate of CS or CS may be the only market maker in such investments. CS is involved in many businesses that relate to companies mentioned in this document. These businesses include specialized trading, risk arbitrage, market making, and other proprietary trading. **TAX:** Nothing in this document constitutes investment, legal, accounting or tax advice. CS does not advise on the tax consequences of investments and you are advised to contact an independent tax advisor. The levels and basis of taxation are dependent on individual circumstances and are subject to change. **SOURCES:** Information and opinions presented in this document have been obtained or derived from sources which in the opinion of CS are reliable, but CS makes no representation as to their accuracy or completeness. CS accepts no liability for a loss arising from the use of this document. **WEBSITES:** This document may provide the addresses of, or contain hyperlinks to, websites. Except to the extent to which the document refers to website material of CS, CS has not reviewed the linked site and takes no responsibility for the content contained therein. Such address or hyperlink (including addresses or hyperlinks to CS's own website material) is provided solely for your convenience and information and the content of the linked site does not in any way form part of this document. Accessing such website or following such link through this document or CS's website shall be at your own risk. **DATA PRIVACY:** Your Personal Data will be processed in accordance with the Credit Suisse privacy statement accessible at your domicile through the official Credit Suisse website <https://www.credit-suisse.com>. In order to provide you with marketing materials concerning our products and services, Credit Suisse Group AG and its subsidiaries may process your basic Personal Data (i.e. contact details such as name, e-mail address) until you notify us that you no longer wish to receive them. You can opt-out from receiving these materials at any time by informing your Relationship Manager.

Distributing entities

Except as otherwise specified herein, this report is distributed by Credit Suisse AG, a Swiss bank, authorized and regulated by the Swiss Financial Market Supervisory Authority. **Austria:** This report is either distributed by CREDIT SUISSE (LUXEMBOURG) S.A. Zweigniederlassung Österreich (the "Austria branch") or by Credit Suisse (Deutschland) AG. The Austria branch is a branch of CREDIT SUISSE (LUXEMBOURG) S.A., a duly authorized credit institution in the Grand Duchy of Luxembourg with registered address 5, rue Jean Monnet, L-2180 Luxembourg. The Austria branch is subject to the prudential supervision of the Luxembourg supervisory authority, the Commission de Surveillance du Secteur Financier (CSSF), 283, route d'Arlon, L-1150 Luxembourg, Grand Duchy of Luxembourg, as well as of the Austrian supervisory authority, the Financial Market Authority (FMA), Otto-Wagner Platz 5, A-1090 Vienna, Austria. Credit Suisse (Deutschland) Aktiengesellschaft is supervised by the German supervisory authority Bundesanstalt für Finanzdienstleistungsaufsicht („BaFin“) in collaboration with the Austrian supervisory authority, the Financial Market Authority (FMA), Otto-Wagner Platz 5, A-1090 Vienna, Austria.

Bahrain: This report is distributed by Credit Suisse AG, Bahrain Branch, a branch of Credit Suisse AG, Zurich/Switzerland, duly authorized and regulated by the Central Bank of Bahrain (CBB) as an Investment Business Firm Category 2. Related financial services or products are only made available to Accredited Investors, as defined by the CBB, and are not intended for any other persons. The Central Bank of Bahrain has not reviewed, nor has it approved, this document or the marketing of any investment vehicle referred to herein in the Kingdom of Bahrain and is not responsible for the performance of any such investment vehicle. Credit Suisse AG, Bahrain Branch is located at Level 21-22, East Tower, Bahrain World Trade Centre, Manama, Kingdom of Bahrain. **Chile:** This report is distributed by Credit Suisse Agencia de Valores (Chile) Limitada, a branch of Credit Suisse AG (incorporated in the Canton of Zurich), regulated by the Chilean Financial Market Commission. Neither the issuer nor the securities have been registered with the Financial Market Commission of Chile (Comisión para el Mercado Financiero) pursuant to Law no. 18.045, the Ley de Mercado de Valores, and regulations thereunder, so they may not be offered or sold publicly in Chile. This document does not constitute an offer of, or an invitation to subscribe for or purchase, the securities in the Republic of Chile, other than to individually identified investors pursuant to a private offering within the meaning of article 4 of the Ley de Mercado de Valores (an offer that is not "addressed to the public in general or to a certain sector or specific group of the public"). **DIFC:** This information is being distributed by Credit Suisse AG (DIFC Branch). Credit Suisse AG (DIFC Branch) is licensed and regulated by the Dubai Financial Services Authority ("DFSA"). Related financial services or products are only made available to Professional Clients or Market Counterparties, as defined by the DFSA, and are not intended for any other persons. Credit Suisse AG (DIFC Branch) is located on Level 9 East, The Gate Building, DIFC, Dubai, United Arab Emirates. **France:** This report is distributed by Credit Suisse (Luxembourg) S.A. Succursale en France (the "France branch") which is a branch of Credit Suisse (Luxembourg) S.A., a duly authorized credit institution in the Grand Duchy of Luxembourg with registered address 5, rue Jean Monnet, L-2180 Luxembourg. The France branch is subject to the prudential supervision of the Luxembourg supervisory authority, the Commission de Surveillance du Secteur Financier (CSSF), and of the French supervisory authorities, the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and the Autorité des Marchés Financiers (AMF). Germany: This report is distributed by Credit Suisse (Deutschland) Aktiengesellschaft regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht („BaFin"). **Guernsey:** This report is distributed by Credit Suisse AG Guernsey Branch, a branch of Credit Suisse AG (incorporated in the Canton of Zurich), with its place of business at Helvetia Court, Les Echelons, South Esplanade, St Peter Port, Guernsey. Credit Suisse AG Guernsey Branch is wholly owned by Credit Suisse AG and is regulated by the Guernsey Financial Services Commission. Copies of the latest audited accounts of Credit Suisse AG are available on request. **India:** This report is distributed by Credit Suisse Securities (India) Private Limited (CIN no. U67120MH1996PTC104392) regulated by the Securities and Exchange Board of India as Research Analyst (registration no. INH 000001030), as Portfolio Manager (registration no. INP000002478) and as Stock Broker (registration no. INZ000248233), having registered address at 9th Floor, Ceejay House, Dr. Annie Besant Road, Worli, Mumbai – 400 018, India, T- +91-22 6777 3777. **Israel:** If distributed by Credit Suisse Financial Services (Israel) Ltd. in Israel: This document is distributed by Credit Suisse Financial Services (Israel) Ltd. Credit Suisse AG, including the services offered in Israel, is not supervised by the Supervisor of Banks at the Bank of Israel, but by the competent banking supervision authority in Switzerland. Credit Suisse Financial Services (Israel) Ltd. is a licensed investment marketer in Israel and thus, its investment marketing activities are supervised by the Israel Securities Authority. **Italy:** This report is distributed in Italy by Credit Suisse (Italy) S.p.A., a bank incorporated and registered under Italian law subject to the supervision and control of Banca d'Italia and CONSOB. **Lebanon:** This report is distributed by Credit Suisse (Lebanon) Finance SAL ("CSLF"), a financial institution incorporated in Lebanon and regulated by the Central Bank of Lebanon ("CBL") and having a financial institution license number 42. Credit Suisse (Lebanon) Finance SAL is subject to the CBL's laws and circulars as well as the laws and regulations of the Capital Markets Authority of Lebanon ("CMA"). CSLF is a subsidiary of Credit Suisse AG and part of the Credit Suisse Group (CS). The CMA does not accept any responsibility for the content of the information included in this report, including the accuracy or completeness of such information. The liability for the content of this report lies with the issuer, its directors and other persons, such as experts, whose opinions are included in the report with their consent. The CMA has also not assessed the suitability of the investment for any particular investor or type of investor. It is hereby expressly understood and acknowledged that investments in financial markets may involve a high degree of complexity and risk of loss in value and may not be suitable to all investors. The suitability assessment performed by CSLF with respect to this investment will be undertaken based on information that the investor would have provided to CSLF as at the date of such assessment and in accordance with Credit Suisse internal policies and processes. It is understood that the English language will be used in all communication and documentation provided by CS and/or CSLF. By accepting to invest in the product, the investor expressly and irrevocably confirms that he fully understands, and has no objection to the use of the English language. **Luxembourg:** This report is distributed by Credit Suisse (Luxembourg) S.A., a duly authorized credit institution in the Grand Duchy of Luxembourg with registered address 5, rue Jean Monnet, L-2180 Luxembourg. Credit Suisse (Luxembourg) S.A. is subject to the prudential supervision of the Luxembourg supervisory authority, the Commission de Surveillance du Secteur Financier (CSSF). **Mexico:** This document represents the vision of the person who provides his/her services to C. Suisse Asesoría México, S.A. de C.V. ("C. Suisse Asesoría") and/or Banco Credit Suisse (México), S.A., Institución de Banca Múltiple, Grupo Financiero Credit Suisse (México) ("Banco CS") so that both C. Suisse Asesoría and Banco CS reserve the right to change their mind at any time not assuming any liability in this regard. This document is distributed for informational purposes only, and does not imply a personal recommendation or suggestion, nor the invitation to celebrate any operation and does not replace the communication you have with your executive in relation to C. Suisse Asesoría and/or Banco CS prior to taking any investment decision. C. Suisse Asesoría and/or Banco CS does not assume any responsibility for investment decisions based on information contained in the document sent, as the same may not take into account the context of the investment strategy and objectives of particular clients. Prospectus, brochures, investment regimes of investment funds, annual reports or periodic financial information contain all additional useful information for investors. These documents can be obtained free of charge directly from issuers, operators of investment funds, in the Internet page of the stock exchange in which they are listed or through its executive in C. Suisse Asesoría and/or Banco CS. Past performance and the various scenarios of existing markets do not guarantee present or future yields. In the event that the information contained in this document is incomplete, incorrect or unclear, please contact your Executive of C. Suisse Asesoría and/or Banco CS as soon as possible. It is possible that this document may suffer modifications without any responsibility for C. Suisse Asesoría and/or Banco CS. This document is distributed for informational purposes only and is not a substitute for the Operations Reports and/or Account Statements you receive from C. Suisse Asesoría and/or Banco CS in terms of the General Provisions Applicable to Financial Institutions and other Legal Entities that Provide Investment Services issued by the Mexican Banking and Securities Commission ("CNBV"). Given the nature of this document, C. Suisse Asesoría and/or Banco CS does not assume any responsibility derived from the information contained therein. Without prejudice to the fact that the information was obtained from or based on sources believed to be reliable by C. Suisse Asesoría and/or Banco CS, there is no guarantee that the information is either accurate or complete. Banco CS and/or C. Suisse Asesoría does not accept any liability arising from any loss arising from the use of the information contained in the document sent to you. It is recommended that investor make sure that the information provided is in accordance to his/her personal circumstances and investment profile, in relation to any particular legal, regulatory or fiscal situation, or to obtain independent professional advice.

C. Suisse Asesoría México, S.A. de C.V. is an investment adviser created in accordance with the Mexican Securities Market Law ("LMV"), registered with the CNBV under the folio number 30070. C. Suisse Asesoría México, S.A. de C.V. is not part of Grupo Financiero Credit Suisse (México), S.A. de C.V., or any other financial group in Mexico. C. Suisse Asesoría México, S.A. de C.V. is not an independent investment adviser as provided by LMV and other applicable regulations due to its direct relationship with Credit Suisse AG, a foreign financial institution, and its indirect relationship with the entities that make up Grupo Financiero Credit Suisse (México), S.A. de C.V. **Netherlands:** This report is distributed by Credit Suisse (Luxembourg) S.A., Netherlands Branch (the "Netherlands branch") which is a branch of Credit Suisse (Luxembourg) S.A., a duly authorized credit institution in the Grand Duchy of Luxembourg with registered address 5, rue Jean Monnet, L-2180 Luxembourg. The Netherlands branch is subject to the prudential supervision of the Luxembourg supervisory authority, the Commission de Surveillance du Secteur Financier (CSSF), and of the Dutch supervisory authority, De Nederlandsche Bank (DNB), and of the Dutch market supervisor, the Autoriteit Financiële Markten (AFM). **Portugal:** This report is distributed by Credit Suisse (Luxembourg) S.A., Sucursal em Portugal (the "Portugal branch") which is a branch of Credit Suisse (Luxembourg) S.A., a duly authorized credit institution in the Grand Duchy of Luxembourg with registered address 5, rue Jean Monnet, L-2180 Luxembourg. The Portugal branch is subject to the prudential supervision of the Luxembourg supervisory authority, the Commission de Surveillance du Secteur Financier (CSSF), and of the Portuguese supervisory authorities, the Banco de Portugal (BdP) and the Comissão do Mercado dos Valores Mobiliários (CMVM). **Qatar:** This information has been distributed by Credit Suisse (Qatar) L.L.C., which is duly authorized and regulated by the Qatar Financial Centre Regulatory Authority (QFCRA) under QFC License No. 00005. All related financial products or services will only be available to Eligible Counterparties (as defined by the QFCRA) or Business Customers (as defined by the QFCRA), including individuals, who have opted to be classified as a Business Customer, with net assets in excess of QR 4 million, and who have sufficient financial knowledge, experience and understanding to participate in such products and/or services. Therefore this information must not be delivered to, or relied on by, any other type of individual. **Saudi Arabia:** This document is being distributed by Credit Suisse Saudi Arabia (CR Number 1010228645), duly licensed and regulated by the Saudi Arabian Capital Market Authority pursuant to License Number 08104-37 dated 23/03/1429H corresponding to 21/03/2008AD. Credit Suisse Saudi Arabia's principal place of business is at King Fahad Road, Hay Al Mhamadiya, 12361-6858 Riyadh, Saudi Arabia. Website: <https://www.credit-suisse.com/sa>. Under the Rules on the Offer of Securities and Continuing Obligations this document may not be distributed in the Kingdom except to such persons as are permitted under the Rules on the Offer of Securities and Continuing Obligations issued by the Capital Market Authority. The Capital Market Authority does not make any representation as to the accuracy or completeness of this document, and expressly disclaims any liability whatsoever for any loss arising from, or incurred in reliance upon, any part of this document. Prospective purchasers of the securities offered hereby should conduct their own due diligence on the accuracy of the information relating to the securities. If you do not understand the contents of this document, you should consult an authorised financial advisor. Under the Investment Fund Regulations this document may not be distributed in the Kingdom except to such persons as are permitted under the Investment Fund Regulations issued by the Capital Market Authority. The Capital Market Authority does not make any representation as to the accuracy or completeness of this document, and expressly disclaims any liability whatsoever for any loss arising from, or incurred in reliance upon, any part of this document. Prospective subscribers of the securities offered hereby should conduct their own due diligence on the accuracy of the information relating to the securities. If you do not understand the contents of this document you should consult an authorised financial advisor. **South Africa:** This information is being distributed by Credit Suisse AG which is registered as a financial services provider with the Financial Sector Conduct Authority in South Africa with FSP number 9788 and / or by Credit Suisse (UK) Limited which is registered as a financial services provider with the Financial Sector Conduct Authority in South Africa with FSP number 48779. **Spain:** This document is a marketing material and is provided by Credit Suisse AG, Sucursal en España, legal entity registered at the Comisión Nacional del Mercado de Valores for information purposes. It is exclusively addressed to the recipient for personal use only and, according to current regulations in force, by no means can it be considered as a security offer, personal investment advice or any general or specific recommendation of products or investment strategies with the aim that you perform any operation. The client shall be deemed responsible, in all cases, for taking whatever decisions on investments or disinvestments, and therefore the client takes all responsibility for the benefits or losses resulting from the operations that the client decides to perform based on the information and opinions included in this document. This document is not the result of a financial analysis or research and therefore, neither it is subject to the current regulations that apply to the production and distribution of financial research, nor its content complies with the legal requirements of independence of financial research. **Turkey:** The investment information, comments and recommendations contained herein are not within the scope of investment advisory activity. The investment advisory services are provided by the authorized institutions to the persons in a customized manner taking into account the risk and return preferences of the persons. Whereas, the comments and advices included herein are of general nature. Therefore recommendations may not be suitable for your financial status or risk and yield preferences. For this reason, making an investment decision only by relying on the information given herein may not give rise to results that fit your expectations. This report is distributed by Credit Suisse Istanbul Menkul Degerler Anonim Sirketi, regulated by the Capital Markets Board of Turkey, with its registered address at Levazim Mahallesi, Koru Sokak No. 2 Zorlu Center Terassever No. 61 34340 Besiktas/Istanbul-Turkey. **United Kingdom:** This material is distributed by Credit Suisse (UK) Limited. Credit Suisse (UK) Limited, is authorized by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. Where this material is distributed into the United Kingdom by an offshore entity not exempted under the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 the following will apply: To the extent communicated in the United Kingdom ("UK") or capable of having an effect in the UK, this document constitutes a financial promotion which has been approved by Credit Suisse (UK) Limited which is authorized by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority for the conduct of investment business in the UK. The registered address of Credit Suisse (UK) Limited is Five Cabot Square, London, E14 4QR. Please note that the rules under the UK's Financial Services and Markets Act 2000 relating to the protection of retail clients will not be applicable to you and that any potential compensation made available to "eligible claimants" under the UK's Financial Services Compensation Scheme will also not be available to you. Tax treatment depends on the individual circumstances of each client and may be subject to changes in future.

UNITED STATES: NEITHER THIS REPORT NOR ANY COPY THEREOF MAY BE SENT, TAKEN INTO OR DISTRIBUTED IN THE UNITED STATES OR TO ANY US PERSON (within the meaning of Regulation S under the US Securities Act of 1933, as amended).

This report may not be reproduced either in whole or in part, without the written permission of Credit Suisse. Copyright © 2021 Credit Suisse Group AG and/or its affiliates. All rights reserved.

21C014A_JS



[credit-suisse.com](https://www.credit-suisse.com)

© 2021, CREDIT SUISSE

