Credit Suisse ESG Research

Tidal Wave Forces Behind Sustainable Finance

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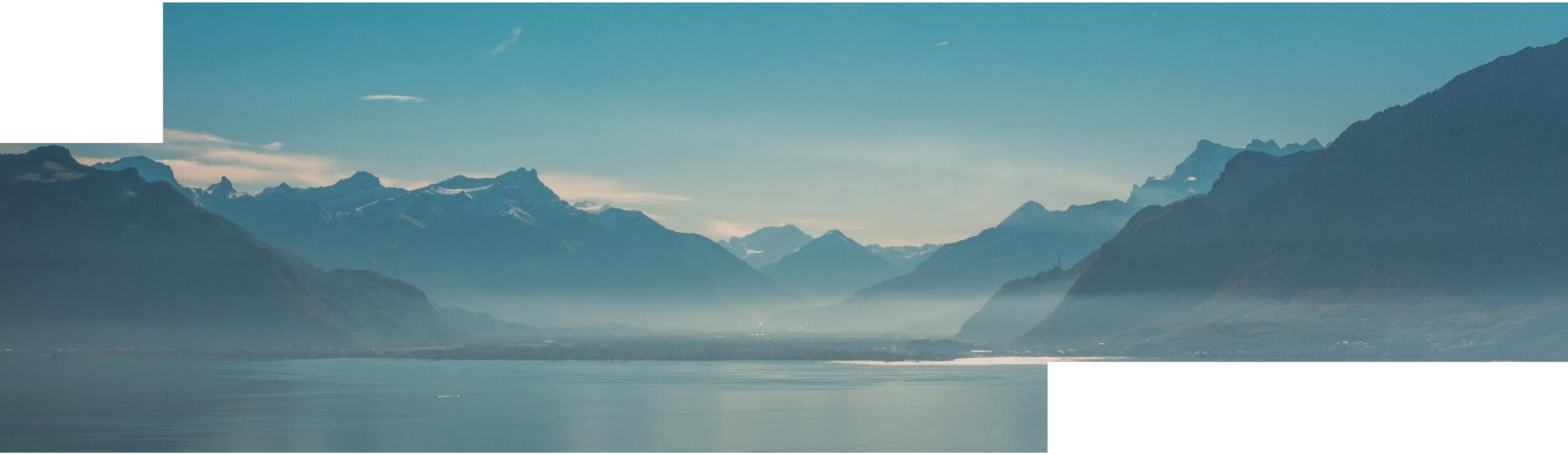
Equity Research | US



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Key Takeaways

Unprecedented Changes Underway Across the Financial System…

Commitment to sustainability is escalating across all players in the financial system	• All types of financial market participants (from asset managers, pension funds, insurers to commercial banks to central banks) are mobilizing to align the financial system with the goals of the Paris Agreement and the UN's Sustainable Development Goals (SDGs). There's line of sight to see **sustainable investing assets grow from $31 trillion in 2018 to >$100 trillion** due to commitments from investors, banks, and governments.
Just over 1% of global financial assets are needed to support sustainability goals	• And to support and achieve the SDGs, the **world needs to redirect just over 1% of the $379 trillion global financial assets annually**, which seems plausible due to the realignment of all financial participants.
Governments are stepping up policies and direct financing for sustainable activities	• Countries responsible for >60% of global emissions have announced or are considering net zero targets by mid-century; thus, **climate policies are expected to step up ahead of the COP26 meeting this November.** Meanwhile, **nearly $2 trillion of COVID green stimulus** is accelerating sustainable developments and having a multiplier effect on private investments.
Asset owners & managers are increasingly seeking impact in addition to ESG risk management	• Asset owners and managers are going beyond ESG integration as a risk management tool to having **active contribution to SDGs and/or alignment with climate outcomes.** At least 33 asset owners and 30 asset managers with >$5 trillion and >$9 trillion in AUM, respectively, have committed to net zero emission portfolios by 2050.
But more work is needed to align sources of financial assets with areas of financial needs	• Over **80% of global financial assets are located in *developed* countries while 70% of the SDG spending needs and >80% of global population are concentrated in *developing* countries.** Financial incentives need to be put in place and/or structural risks (e.g., lack of institutional depth, inefficient financial systems, political uncertainty, etc.) need be addressed to spur investments in emerging markets.

…Are Having Sustained Impacts on Asset Valuation & Cost of Capital

Clear "greenium" in the sustainable debt market	• Our analysis of **corporate sustainable bonds found that they have enjoyed a consistent premium of ~10-20bps over their conventional counterparts since 2019** largely due to market demand. The ~\$1.6 trillion sustainable bond market is just a tiny portion of the ~\$128 trillion global public fixed income market and is opening up to companies in transition (through sustainability-linked and transition bonds).
Significant multiple expansion for pure-play "transition enablers" and fund flows will support premium valuation	• Sustainable investing AUM could go from **15-20% of the global public equity market to >50%, supporting the premium valuation for pure-play "transition enablers."** Whether it's fund mandate or market accessibility, the **majority of ESG investing capital is aimed at the *developed* markets even though investments are needed more in *emerging* countries,** which will continue to elevate valuations in the former.
ESG-themed SPACs in high demand despite in early development stage	• Out of 157 SPACs that have completed/announced/in talks on deals since 2018, **roughly one-third are related to the energy transition or broader ESG-themes where shares have nearly doubled on average since announcement.** The strong performance, attractive market valuation, and investor interest will encourage more private, early growth sustainability companies to come public via SPACs.
Increased engagement with "transition stories" means more divergence of capital flow between leaders and laggards	• As investors increasingly commit to net zero emission portfolios, more are **seeking engagement with heavy emitters to effect change rather than outright divestment**. Companies within carbon-intensive industries that set Paris-aligned interim targets and show tangible/meaningful progress (i.e., "transition stories") should benefit from fund flows relative to peers that are lagging and/or gain access to the evolving sustainable debt market.
Growth in alternative investments funds early stage technologies and innovation	• AUM growth of alternative assets (e.g., private equity, private debt, infrastructure, etc.) is expected to outpace public markets and **sustainability investments are well suited to capture this growth** given the excess return potential from early stage sustainability-related technologies, demand from asset owners for such exposure, and attractive exit opportunities.

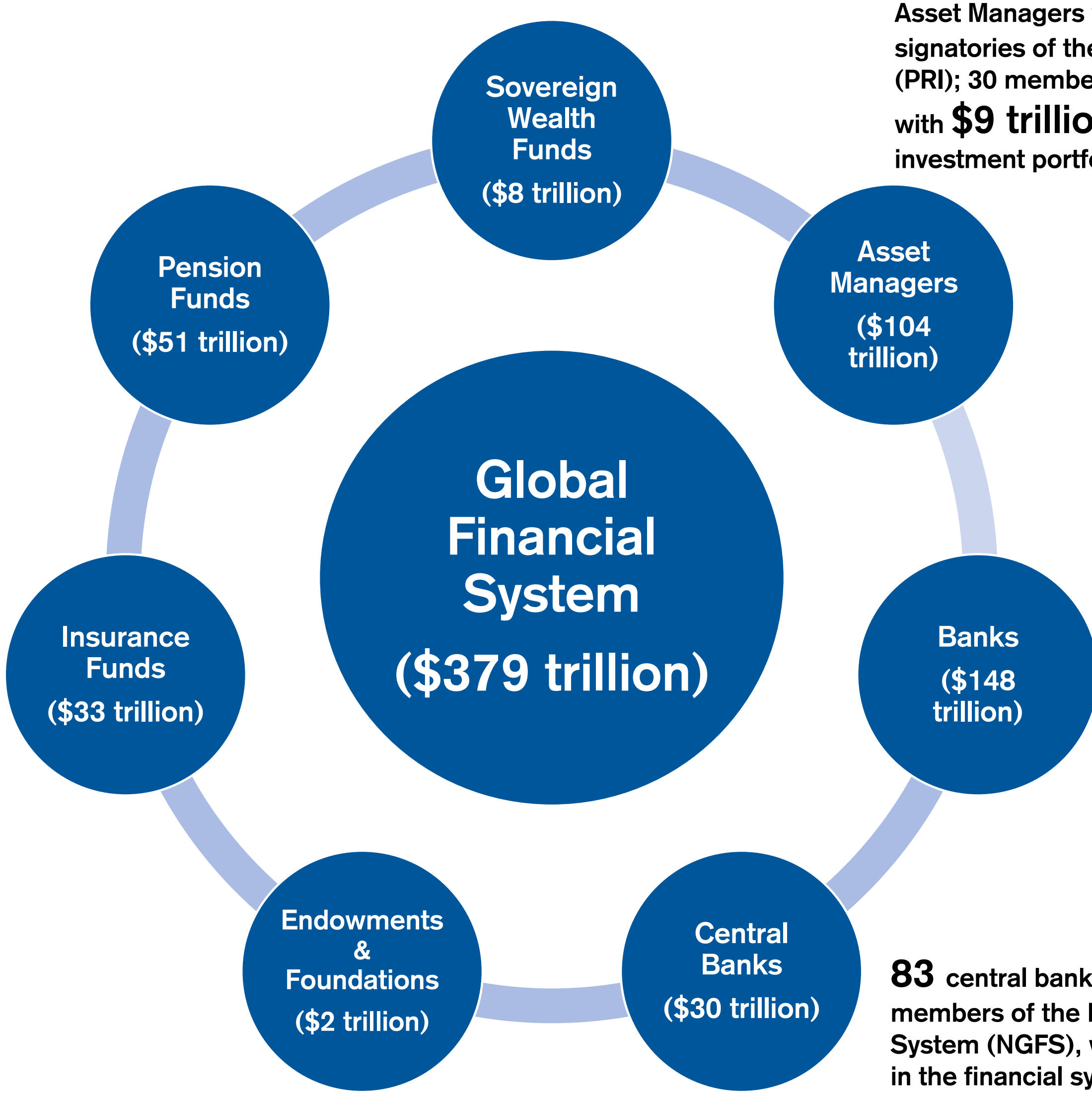
Putting the "Trillions" in Perspective

Sustainability is Getting Embedded Across the Global Financial System

Tidal Wave Forces Behind the Growth in Sustainable Finance

Asset owners (such as endowments & foundations, insurers, pension funds, sovereign wealth funds) are increasingly incorporating ESG strategies and seeking *impact* strategies, in addition to traditional risk-adjusted return

Asset owners account for 17% of PRI signatories and nearly $24 trillion of AUM at YE20; 33 members of the Net Zero Asset Owner Alliance have >$5 trillion in AUM currently and are targeting at least 200 members or **$25 trillion in AUM by 2025.**



Asset Managers with **$80 trillion** in AUM are signatories of the Principles for Responsible Investment (PRI); 30 members of the Net Zero Asset Managers Initiative with **$9 trillion** in AUM are committed to net zero investment portfolios by 2050

214 banks are signatories of the UN Principles for Responsible Banking, accounting for **>$53 trillion** of global banking assets; increasing number of banks are committing to net zero financed emissions and sustainable financing targets

83 central banks and financial supervisors are members of the Network for Greening the Financial System (NGFS), which aims to manage climate risks in the financial system and support the transition to a low-carbon economy

Source: FSB (*Global Monitoring Report on NBFI 2019*); Thinking Ahead Institute (Reports *Global Pension Assets Study 2020*; *The World's Largest 500 Asset Managers*) and Credit Suisse Research

Note: Total global financial assets as of YE 2018 for 40 developed & developing countries; Asset manager AUM contains some overlap with other financial entity AUMs

Just 1% of the Global Finance is Needed to Meet Sustainable Goals

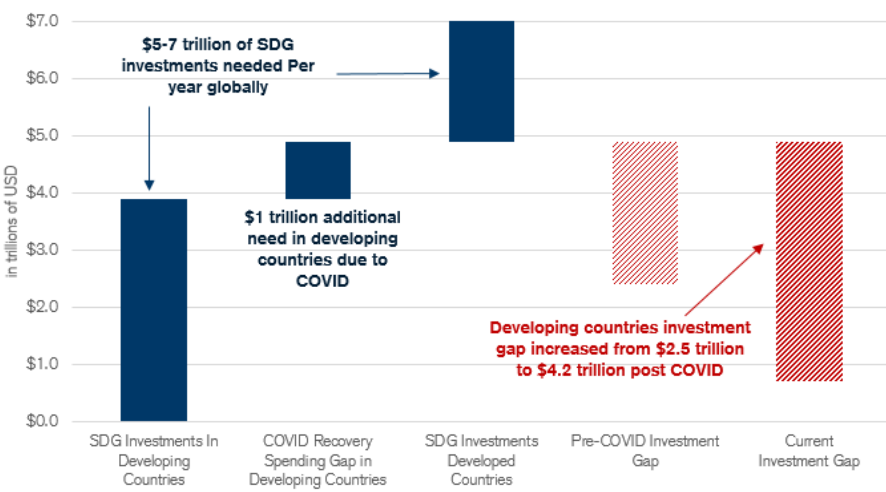
- **Funding gap of $4.2 trillion per year to achieve the UN Sustainable Development Goals (SDGs)**: Global investment needs are in the order of **$5-$7 trillion per year** mainly for basic infrastructure (roads, rail and ports; power stations; water and sanitation), food security (agriculture and rural development), climate change mitigation and adaptation, health, and education. Due to COVID-19, the **annual investment gap has grown from $2.5 trillion to $4.2 trillion per year** over the period.

- **For energy specifically, $2-3 trillion of annual investments are needed to transform how the world *supplies* energy:** By most agency forecasts**, energy transition alone could cost at least $40-$60 trillion over the next 20 years just to transform supply-side of energy**. This implies roughly a *tripling* of annual spending in areas such as renewable energy, battery storage, electric grid upgrade and expansion.

- **Alignment of global financial system to sustainability goals is already underway:** While we have been skeptical of the financial market's ability to ramp up spending at such a magnitude, **the rapid realignment of global financial system – from investment managers to banks - means fund flows into sustainability may be faster and greater than what was anticipated a year ago**. While COVID-19 created competing priorities for the global economy, it also enabled the "green" recovery with increased government spending on sustainable initiatives which will result in a multiplier effect on private capital.

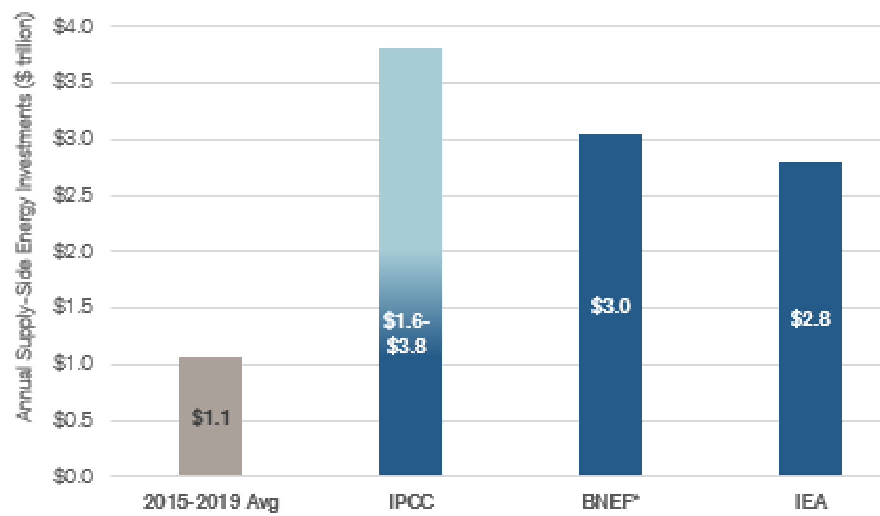
- **The accelerators to sustainable investments are clarity of government policies and global "green" standardization:** Clarity around **government sustainability policies, particularly in Europe, has been a key driver of private sector investments**. Countries around the world are following suit. Standardization and "sustainable" taxonomy are equally important as it instructs how and where capital can be allocated.

Majority of SDG Investments Are in *Developing* Countries



Source: OECD (*Global Outlook on Financing for Sustainable Development 2021)* and Credit Suisse

Supply-side Annual Energy Investments Needed to Limit Warming to 1.5°C (2020-2040 vs. 2015-2019 Annual Average - $ Trillion)



Source: IEA, BloombergNEF, IPCC and Credit Suisse
* BNEF investment forecasts reflects just power sector and grid investments

Sustainability Now Driven by All Players in the Financial System

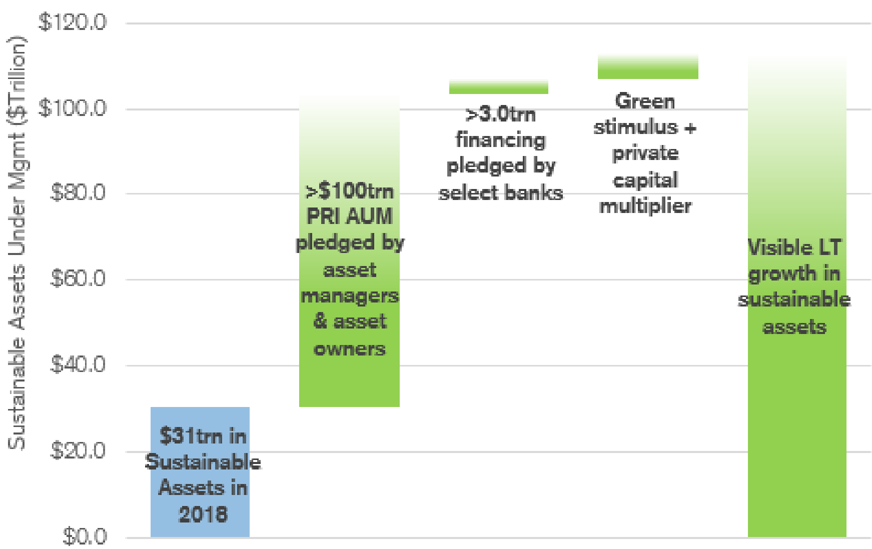
- **Sustainable investment assets have grown significantly since 2018:** The Global Sustainable Investment Alliance had last pegged sustainable investing assets (defined as those that considers ESG factors in portfolio selection and management) at $31 trillion as of 2018. If the PRI signatories are an indication, **>$100 trillion of assets under management** (~80% of which is from asset managers such as BlackRock and State Street) will incorporate sustainable investing over time.

- **Banks have pledged to grow sustainable finance…** Overall sustainable assets could be boosted further by commitments to increase sustainable finance by banks with **over $3 trillion based just on the six largest US banks and a handful of select non-US banks** as well as indirect effects from central banks incentivizing green finance (e.g., through purchases of sustainable debt and setting green principles for their own reserves).

- … **while government green stimulus would also have a multiplier effect on private capital:** Our estimate of confirmed and specified government green stimulus announced as part of COVID recovery packages to date is ~$1.85 trillion globally, although we'd note WoodMackenzie's has put the figure closer to ~$4 trillion (perhaps due to less stringent criteria). Nonetheless, with an estimated private capital multiplier of two to three times public investments, our estimate could mean **$6-$8 trillion of combined recovery spending** to accelerate decarbonization of the economy.

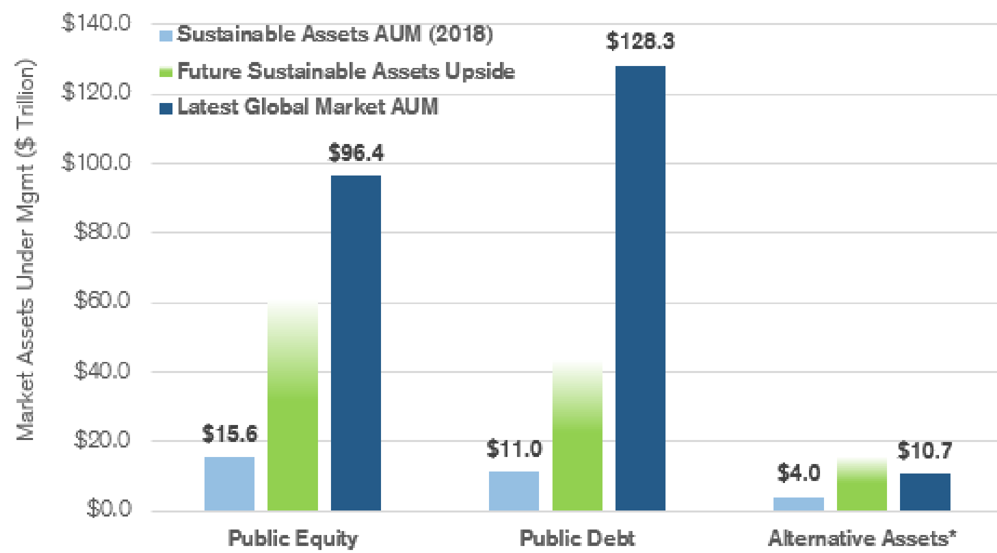
- **Massive fund flow implications to existing public and private markets:** To put the above figures into perspective, they are a **significant portion of the >$220 trillion in global public equity and fixed income assets today**. Notably, in 2018 ~13% of sustainable investing funds were allocated to alternative assets (for which AUM growth is expected to outpace public markets), substantially higher than the ~4-5% alternative assets account for as part of overall market.

Sustainable Investing AUM Could Reach Multiples of 2018 Level…



Source: Global Sustainable Investment Alliance and Credit Suisse Research

…And Substantial Portion of Global Market AUMs Across Asset Classes



Source: Bloomberg, International Capital Market Association, Preqin and Credit Suisse Research
*Alternative Assets includes private equity, real estate, infrastructure, Hedge Funds & Commodities

Focusing on Paris Alignment and Impact In Addition to Integration

- **Differentiating ESG integration and sustainable investing:** ESG integration is often used interchangeably with the term “sustainable investing” when in fact they are different strategies. **ESG integration is a risk-driven approach where investors consider the financial materiality of non-financial factors** (e.g., environmental, social and governance issues) in their investment process. Meanwhile, **sustainable investing takes the ESG assessment further by reflecting client values** which can range from exclusionary/best-in-class screening to focusing on specific social or environmental themes.

- **ESG 3.0 is focusing on real-world impact:** The Thinking Ahead Institute survey of the world’s 100 largest asset owners showed increasing emphasis on investments having impact (i.e. seeking intentional and measurable positive societal and/or environmental benefits) in addition to delivering risk-adjusted returns. This is consistent with the growing calls from the society more broadly to align finance to the net-zero economy… this means **moving beyond climate-risk management (how companies assess and manage climate-related risks and opportunities) to active contribution to SDG goals and/or alignment to climate outcomes (encouraging activities that enables decarbonization while discourage those that don’t).**

- **Proliferation of sustainability taxonomy and frameworks are facilitating impact:** This comes in the form of **1) government mandates**, such as EU requiring financial market participants and corporates to report their exposure to sustainable activities in accordance with **EU Taxonomy**; **2) Investor-led goals and benchmarks,** such as the two separate Net Zero alliances for asset owner and asset managers; **3) increased measurement and transparency,** such as the commitment made by BlackRock to publish a temperature alignment metric for all of its public equity and bond funds by YE 2021.

The ESG Investing Spectrum of Capital/Impact

Investment Approach	Traditional	Responsible	Sustainable	Impact-Driven		Philanthropy	
Financial Goals	Accept competitive risk-adjusted financial returns				Accept dis-proportionate risk-adjusted returns	Accept partial capital preservation	Accept full loss of capital
Impact Goals		Avoid harm and mitigate ESG risks					
			Benefit all stakeholders				
				Contribute to solutions			
	<u>Don't consider</u> May have significant effects on important negative outcomes for people and the planet	**<u>Avoid Harm</u>** Try to prevent significant effects on important negative outcomes for people and planet	**<u>Benefit</u>** Affect important positive outcomes for various people and the planet	**<u>Contribute</u>** Have a significant effect on important positive outcomes for underserved people or the planet			

Growing Investor Focus

Pure Profit ⟷ **Pure Social**

Source: The rise of impact — five steps towards an inclusive and sustainable economy; UK National Advisory Board on impact investing 2017 & Impact Management Project 2017; KPMG-CAIA-AIMA-CREATE Survey 2020

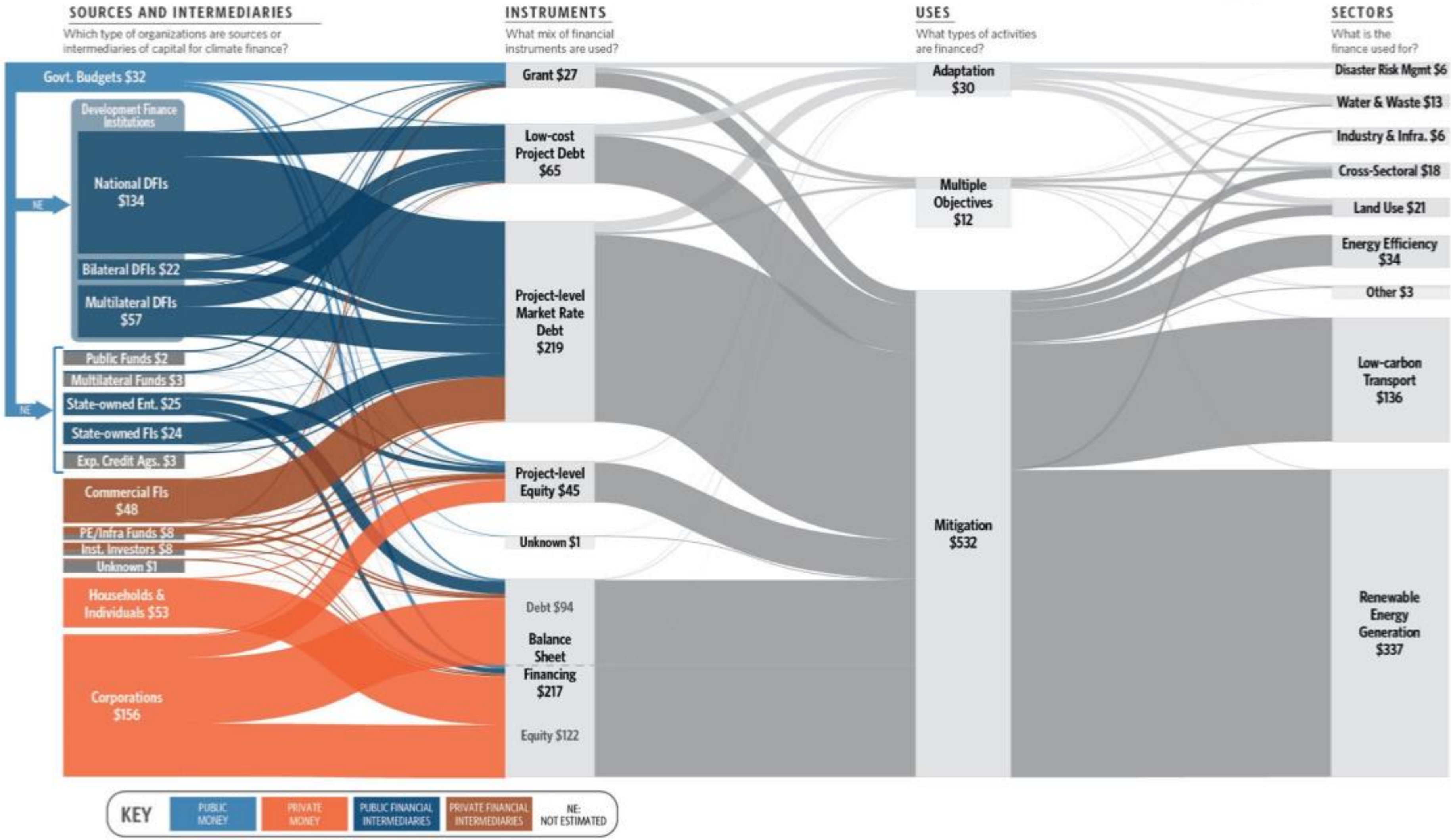
Trends in Financial Market Participants

The Private Sector Needs to Step Up Sustainable Investments

Looking just at climate finance (a subset of sustainable investments), we note that **1) existing investments are falling short of requirements.** The Climate Policy Institute (CPI) estimates climate finance reached $608-$622 billion in 2019, far below investments needed to achieve Paris goals; **2) the private sector makes up for less than half of the spending.** The CPI's Sankey diagram below of the 2017-2018 average climate finance shows private sector spending has been primarily focused on climate mitigation (such as renewable energy) with insufficient focus on other climate objectives such as energy efficiency, land use, infrastructure. That said, the private sector's contribution is poised to step up markedly in the coming decade.

Public accounts for **52%** of total spend

Private institutes account for the remaining **48%**



Source: Climate Policy Institute – *Global Landscape of Climate Finance in 2019*

Sustainable Investing As Defined by Alignment to the Paris Agreement

At the core of the private sector are financial institutions, which have a **unique role to play in the energy transition as they provide funding and other services** to companies across all sectors that are responsible for reducing GHG emissions as well as to companies providing climate solutions. Indeed, the critical role of finance is recognized as one of three long-term goals for the Paris Agreement, which seeks to "making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development."

The global financial system is collectively managed by financial institutions and institutional investors, which we break down into four sub-groups that can have the most impact on sustainable fund flows: **asset owners, asset managers, investment/commercial banks, and central banks.** Now armed with firm support from governments around the world (including the US), these players are **increasingly advancing their sustainability commitments to be aligned with the Paris Agreement's first goal** of "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels"… which for the latter to be achieved requires "net zero" CO_2 emissions globally by 2050.

Through the financial tools under their control, these entities can have an impact on the real economy by **lowering cost of capital** and **providing liquidity** for Paris compatible activities while doing the opposite for incompatible activities.

Asset Owners	• Asset owners (such as pension funds, foundations, insurers, sovereign wealth funds, endowments, and other "institutional investors") are seeking impact in addition to returns. Already, **at least \$5 trillion in AUM (with line of sight to \$25 trillion by 2025) have committed to make their portfolios net zero emissions** by 2050.
Asset Managers	• Manage the outsourced funds of the *asset owners* and account for **~27% of the global financial system** (or ~\$105 trillion). Including BlackRock, asset managers with **at least \$18 trillion in AUM have committed to ensuring or helping their investment portfolios reach net zero emissions** by 2050.
Banks	• Primarily consist of investment and commercial banks and account for **~40% of the global financial system** (or ~\$150 trillion). The six largest US banks as well as four non-US banks we've tracked have earmarked **>\$3.0 trillion for sustainable financing activities** by 2030. Meanwhile, **BofA, Morgan Stanley, HSBC, TD, Banco Santander and Barclays have committed to net zero financed emissions** by 2050.
Central Banks	• Among other responsibilities, oversee their countries' commercial banking system and cumulatively manage **~8% of the global financial system** (or ~\$30 trillion) through reserve assets. In just three years, **83 central banks have joined the Network of Central Banks and Supervisors for Greening the Financial System** which seeks to manage climate risks in the financial system and support the transition to a low-carbon economy.

Source: Credit Suisse research

Asset Owners & Managers: Committing to "Net Zero" Emission Portfolios

While a net zero emission portfolio broadly means to be invested in companies that do not generate emissions or an equivalent amount of offsets/removals, there is no one-size-fits-all approach as firms differ in terms of business mix, regulatory aspects, investment goals, etc. But what is clear is **that major asset owners and managers are increasingly moving in this direction**, which means increasing pressure on high emitters and energy transition laggards and fund flows into ESG/sustainable investments.

- **Asset owners:** Backed by the United Nations and Principles for Responsible Investment, the Net Zero Asset Owner Alliance (AOA) is a consortia of institutional investors who have pledged to make their portfolios net zero emissions by 2050. The Alliance has grown from 12 founders in September 2019 to **33 members with >$5 trillion in assets under management (AUM) currently and is targeting at least 200 members or $25 trillion in AUM by 2025**. In January, the Alliance released a **first-of-its-kind framework for setting and reporting key targets during 2020-25** which it plans to update every five years (see summary table below). The UN's Secretary-General António Guterres referred to the Alliance as the "gold standard" for a slew of emerging net zero commitments. Interestingly, the framework encourages increased engagement (rather than outright divestment) with heavy emitters in order to have an impact on the real economy as well as investment into low- or no-carbon solutions.

- **Asset managers:** With their clients (i.e., asset owners) increasingly requesting more ESG- and climate-focused portfolios, asset managers are also making similar commitments. In December, **over 30 asset managers with $9 trillion in AUM (including the likes of Fidelity, Wellington and UBS Asset Management) committed to ensuring their investment portfolios will have net zero emissions by 2050** or sooner with a very similar, albeit higher level framework as the one adopted by the AOA. While it's not (yet) specifically part of this initiative, **BlackRock** – the world's largest asset manager – more recently unveiled a commitment and high-level plan to help its clients transition their portfolios to adapt to a net zero economy with improved "temperature aligned" disclosure, interim net zero targets, and more environmental-related engagements/votes.

The Net Zero Asset Owner Alliance's Inaugural 2025 Target Setting Framework

'Sub-Portfolio'(1) Targets	Sector Targets	Engagement Targets	Financing Transition Targets
● -16% to -29% CO_2e reduction by 2025 on listed equity, publicly traded corporate debt and real estate portfolios	● Intensity-based reductions on Alliance priority sectors (Oil & Gas, Utilities, Steel, and Transport – Aviation, Shipping, Heavy and Light Duty Road)	● Engagement with 20 companies with a focus on highest emitters or those responsible for 65% of emissions in portfolio (either direct, collective, or via asset manager)	● Report on progress on climate-positive investments and contributions to activities enlarging the low carbon investment universe and building solutions
● Covers portfolio Scope 1 & 2 emissions, tracking of Scope 3 emissions as far as data is available	● Scope 3 to be included wherever possible (e.g., focus on transport which is a large component of oil & gas Scope 3)	● Should be set in conjunction with sub-portfolio and sector targets as engagement is the primary mechanism for achieving them	● Focus on renewable energy in emerging markets, green buildings, sustainable forests, and green hydrogen, among others
● Absolute or intensity-based reduction against 2019 base year recommended	● Sector specific intensity KPIs recommended	● Key expectations for all companies in member portfolios include commitment to net zero GHG emissions by 2050 with aligned interim reduction targets and TCFD disclosure	● Members may invest in assets which increase portfolio emissions initially but enables an investor to encourage or finance low carbon transition actions in the company

Source: Net Zero Asset Owner Alliance, Credit Suisse research
(1) Sub-portfolio targets cover asset classes where credible methodologies and sufficient data coverage exist today. Later, once full coverage is reached, these will be termed simply 'Portfolio targets'.

Banks: Committing to “Net Zero” Financed Emissions

Large diversified banks are also increasingly **committing to 2030 targets for sustainable financing and, more recently, to “net zero financed emissions” by 2050**. These commitments as they stand today are largely in the form of general statements and announcements without much details, but nonetheless imply more funding *restrictions* for the fossil fuel industry and *allowances* for climate- and ESG-related solutions.

- **Sustainable financing targets:** Over the last several years, **nearly every major global bank has announced some form of a 2030 sustainable financing target**, which broadly means providing capital (e.g., loans) for low-carbon solutions (e.g., energy efficiency, renewable energy, sustainable transportation, etc.) as well as social causes (e.g., affordable housing, education, health care, etc.). This funding availability often comes from issuing green, sustainability/-linked, or social bonds which are then loaned out accordingly. For example, Bank of America (BofA) issued ~$2 billion of green bonds in 2019, all of which was allocated to various wind and solar developers. BofA plans to mobilize $300 billion towards low-carbon business activities over the next decade, well above the $125 billion it allocated from 2007-19. We’d also note the **six largest US banks as well as HSBC, TD Bank, Banco Santander and Barclays collectively plan to allocate >$3.0 trillion** towards sustainable activities by 2030. This even excludes JPMorgan Chase as it has not yet provided a sustainable financing target beyond 2020, but we expect it will do so.

- **Net zero financed emissions:** A new theme that emerged last year was a **handful of large banks (e.g., Morgan Stanley, HSBC, TD, Barclays, and most recently BofA and Banco Santander) announcing commitments to reach net zero financed emissions by 2050**. While they all still lack detail on how they get there, we interpret it to essentially mean a phasing out of financing for fossil fuels (over time with interim targets by sector) while ramping up financing for low-carbon solutions. With pressure from investors and an increasing number of banks committing to the Partnership for Carbon Accounting Financials (PCAF) organization – which means they will measure and disclose the GHG emissions associated with their loans and investments – we expect more and more banks to unveil similar targets. Most notably, **JPMorgan Chase – the largest US bank by assets/market cap and global financer of fossil fuel activity – recently made a “Paris-Aligned Financing Commitment”** and will establish 2030 emission targets for its financing portfolio (focused on the oil and gas, electric power and auto sectors) in 2021, which will certainly add pressure to the likes of Wells Fargo and Citi to follow suit.

Summary of Key Sustainability Commitments from Major US and Select Non-US Banks (all currency in USD)

Company	Market Cap (in billions)	Total Assets (in billions)	Sustainable Financing Targets	Total Fossil Fuel Financing/ Global Rank (2016-19)	Net Zero Financed Emissions by 2050?	Committed to PCAF?
JPMorgan Chase	$459.6	$3,386	$200 billion from 2017-20	$269 billion/#1	– (1)	✗
Bank of America	$315.5	$2,820	$300 billion by 2030	$157 billion/#4	✓	✓
Wells Fargo	$158.1	$1,955	$200 billion by 2030	$198 billion/#2	✗	✗
Morgan Stanley	$144.5	$1,116	$250 billion by 2030	$92 billion/#11	✓	✓
Citigroup	$143.8	$2,260	$250 billion by 2025	$189 billion/#3	✗	✓
HSBC	$123.4	$2,956	$750 billion to $1 trillion by 2030	$87 billion/#12	✓	✗
Goldman Sachs	$114.2	$1,163	$750 billion by 2030	$84 billion/#14	✗	✗
TD Bank	$112.3	$1,356	$78 billion by 2030	$103 billion/#8	✓	✓
Banco Santander	$62.4	$1,840	$145 billion by 2025, $266 billion by 2030	$26 billion/#29	✓	✗
Barclays	$40.3	$1,903	$137 billion by 2030	$118 billion/#7	✓	✓

Source: Company documents, Partnership for Carbon Accounting Financials, Rainforest Action Network, Thomson Reuters Eikon, Credit Suisse research
(1) "Paris-Aligned Financing Commitment" - will establish 2030 emission targets for its financing portfolio (focused on the oil and gas, electric power and auto sectors) in 2021

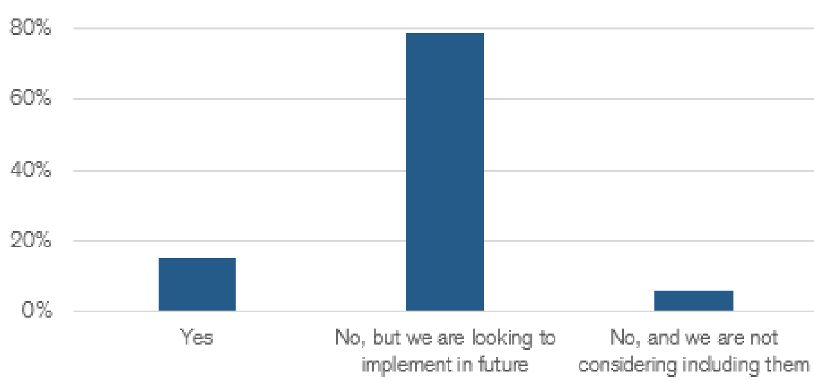
Central Banks: Climate-related Supervision and Investing is Coming

Central banks around the world are increasingly realizing the need to take climate change into account in their supervision of financial institutions and reserve portfolios. The Network of Central Banks and Supervisors for Greening the Financial System (NGFS) – which seeks to manage climate risks in the financial system and support the transition to a low-carbon economy – has grown from **eight central banks at its founding in late 2017 to 83 central banks as of December 2020** with the most recent notable new member being the US Federal Reserve. While mandates and approaches to addressing climate change will vary by central bank, we see increased **climate-related stress testing and greening of reserve portfolios** as top measures to be monitored.

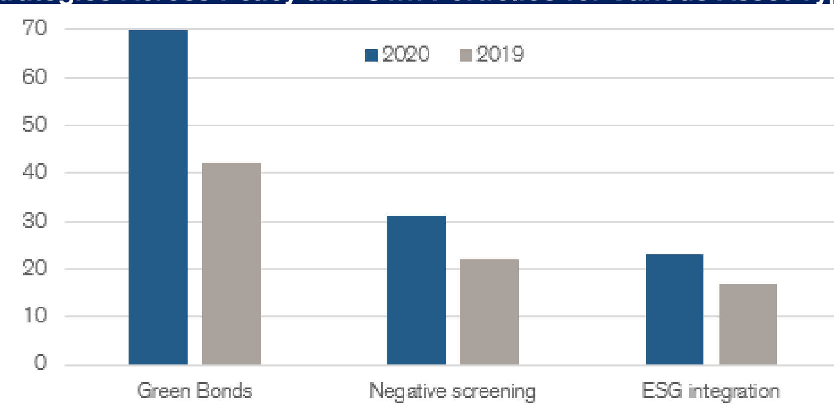
- **Climate-related stress testing:** Determines the size of probable financial losses of banks' portfolios under various climate-related scenarios, with the most "stress" coming from loans/investments exposed to extreme weather events (i.e., physical risks) and the fossil fuel industry (i.e., transition risks). In June 2020, the **NGFS published a first-of-its-kind guide on climate stress testing** for central banks and supervisors. A number of countries (including several across the EU, the UK, Brazil, Hong Kong, Japan, and Australia) already have measures in place or announced to assess climate risk in stress tests. While this list represents a minority of central banks around the world, we'd note a recent survey from the Official Monetary and Financial Institutions Forum (OMFIF) of 33 central banks highlighted **~80% of respondents are looking to include climate considerations in stress tests in the future** (although unlikely the US any time soon). This likely also means more climate-related financial disclosures (e.g., TCFD), criteria standards for green lending (e.g., taxonomies), and reluctance to fund fossil fuel activities.

- **Greening of reserve portfolios:** Global central banks account for **~8% of the global financial system** (or ~$30 trillion of AUM), of which on average ~80% is in 'policy' portfolios (mainly includes high-grade government/supranational debt) and ~15% is in 'own' portfolios (equities, corporate bonds, and private debt). While central banks tend to be more constrained than other global public investors in terms of what asset classes they are eligible to purchase, the rate of central banks adopting some form of sustainable and responsible investment (SRI) practices is growing. Already, European Central Bank (ECB) accepts green bonds and more recently sustainability-linked bonds as central bank collateral this year. A recent survey conducted by the NGFS showed that **~62% and ~67% of respondents have adopted SRI practices into their 'policy' and 'own' portfolios, respectively, up from ~46% and ~53% last year**; another ~10-20% are considering it. With green bond investing being the most popular SRI strategy, this growth among central banks should continue, particularly in conjunction with the growing supply of green bonds and improving ESG data.

"Do you include climate-related risks and/or climate-risk scenario analysis in stress testing?", Share of Responses(1)



Number of "Yes" and "Under consideration" Responses to SRI Strategies Across Policy and Own Portfolios for Various Asset Types(2)



Source: (1) OMFIF Central Banks and Climate Change Survey 2019 of 33 central banks, (2) NGFS' Dec 2020 progress report on the implementation of SRI practices in central banks' portfolio management; respondents of 21 for 2020 and 13-17 for 2019; negative screening and ESG integration applies to corporate bonds and equities only

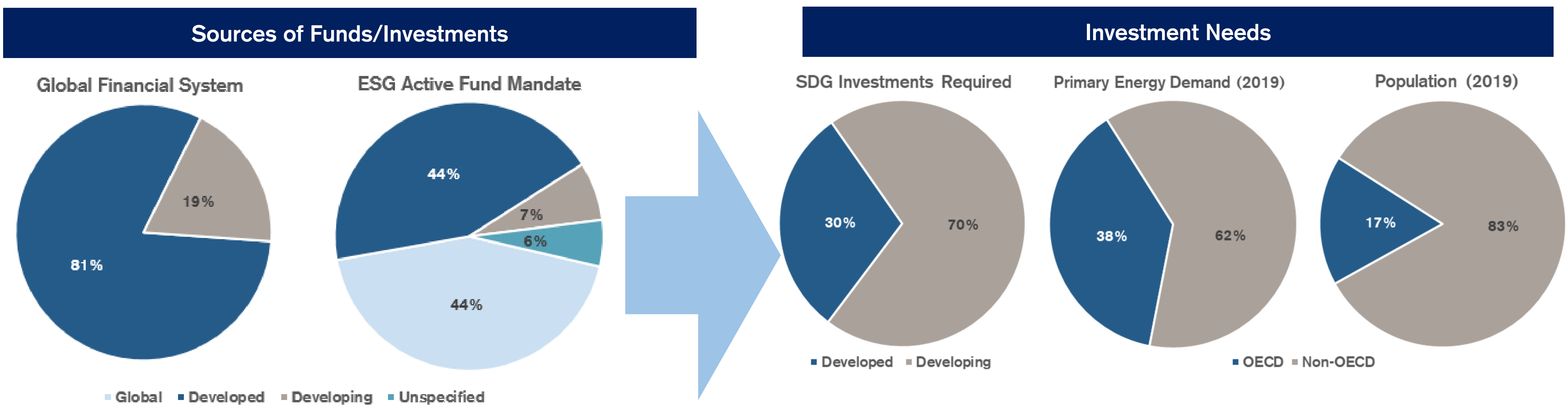
But Need Better Alignment of Investment Capital and Demand

- **The majority of global financial assets sit in *developed* countries…** The OECD estimates **81% of the global financial assets are held in higher income countries** which grew during the pandemic due to quantitative easing by central banks. In addition, according to Morningstar data, **88% of explicit ESG-dedicated active funds have either a global or developed countries mandate**, indicative of the investment community's focus areas.

- **…while financing needs are primarily in *developing* countries:** SDG investments in developing countries alone range from **$3.3 trillion to $4.5 trillion per year. COVID added another $1 trillion in financial needs.** Non-OECD countries also account for the **vast majority of the world's energy demand and population**, implying greater capital requirement to decarbonize developing economies.

- **Concentration of financial assets could be driving up valuation of "green" or "sustainability-enabling" assets in developed markets:** The **mismatch of financing supply & demand helps to explain, at least in part, the "green" premium** that exists across asset classes from sustainable bonds to equity valuation of pure-play transition enablers (e.g., hydrogen, renewable energy…etc). Even at asset levels, CS analysts found that new offshore wind projects (mostly in OECD countries) are earning only a modest 5-6% post-tax nominal project-level IRRs, limiting value creation for the asset owners.

- **Innovative solutions are needed to spur investments in emerging markets:** While there are structural reasons for lack of funding in emerging markets (e.g., lack of institutional depth, inefficient financial systems, political risks, etc.), the **sustainability push in developed countries will have ripple effects globally** (such as potential for carbon border tax adjustment and institutional pressure on corporates to limit their supply chain emissions). **Public-private partnerships enabled by Development Finance Institutions (DFI) are another source of financing** – such as one created by JPM in Jan 2020. And finally, **potential for excess returns may be another draw for institutional investors** considering emerging market ESG funds have seen outsized outperformance relative to conventional benchmarks, more so than ESG funds specialized in developed regions.



Source: OECD, International Energy Agency, Morningstar, and Credit Suisse Research

Governments to Provide Needed Policy and Funding Support

Government Policies and Spending Drive Speed of Transition

Given the enormous scope of the transition to a low-carbon economy and profound changes required in the entire energy system, the **transition cannot happen within the necessary timeframe without government policies and spending** that set the directives on emission mitigation efforts and flows of investment. We highlight three main reasons government support and action are critical to driving sustainable fund flows:

Determines rules of compliance

- Climate-related regulation and policies are essential for **accelerating the private sector's transition to a low-carbon world**, particularly among carbon-intensive industries. These "rules of the game" **not only force change, but they also enable a more visible and certain investment climate** which in turn can cause impacted market players to step up their own efforts (such as asset owners and managers committing to transition their investment portfolios to net zero GHG emissions by 2050).

Spurs a shift in capital allocation from investors

- Governments have the **resources and financial firepower needed to make a meaningful impact on emerging technologies/industries** deemed to be critical to the transition. With this type of support, **private investor capital tends to follow which increases the overall fund flow** towards sustainable investments. Recent examples of this trend include the surging stock prices of hydrogen and electric vehicle companies, both of which were triggered by government support (notably the EU).

Lowers the cost of financing for companies and consumers

- As the costs to develop many of the new, emerging technologies at scale are still too high today, **governments can help ease this burden and incentivize private investment through tax credits and research and development investment**. In the US, we are monitoring a potential extension of tax credits related to solar/wind projects, electric vehicle purchases, and carbon capture and storage facilities.

Government Climate Polices are Accelerating but Insufficient

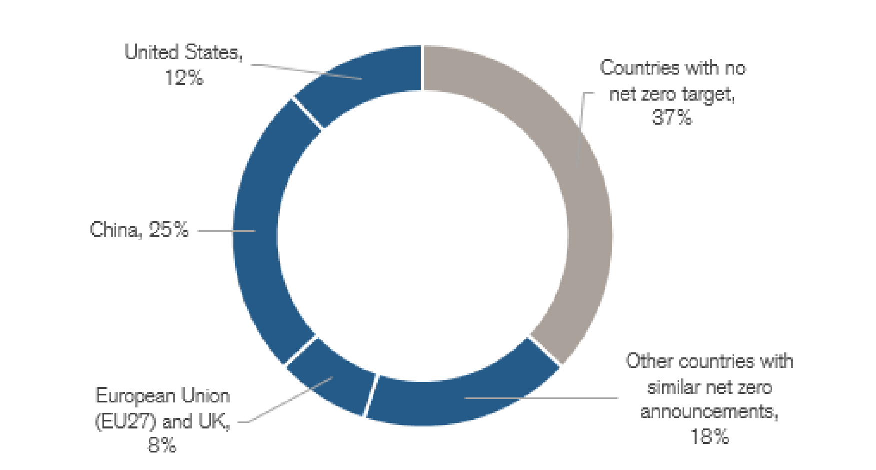
In total, **127 countries responsible for >60% of global GHG gas emissions are considering or have adopted net zero targets**, according to the Climate Action Tracker ("Tracker"). This includes the "Big 3" – China, US, and the EU which collectively account for half of global fossil fuel demand. If all national governments meet their net zero emissions targets, warming could be as low as 2.1˚C by 2100, putting the Paris Agreement's 1.5˚C limit within reach, according to the Tracker. While a wide gap remains between current policies in place and targets, it should begin to narrow this year starting with the US.

- **End of century warming estimates based on "current policies" in place have fallen by 0.7˚C since 2015 (post the Paris Agreement):** The Tracker's estimate of real-world action based on all adopted national policies ("current policies" scenario) has substantially decreased by 0.7°C from 3.6°C in 2015 in to 2.9°C today. Implementation of new policies, increased use of renewable energy, a downturn in the use of coal and lower economic growth assumptions (both prior and due to the pandemic) caused most of the drop.

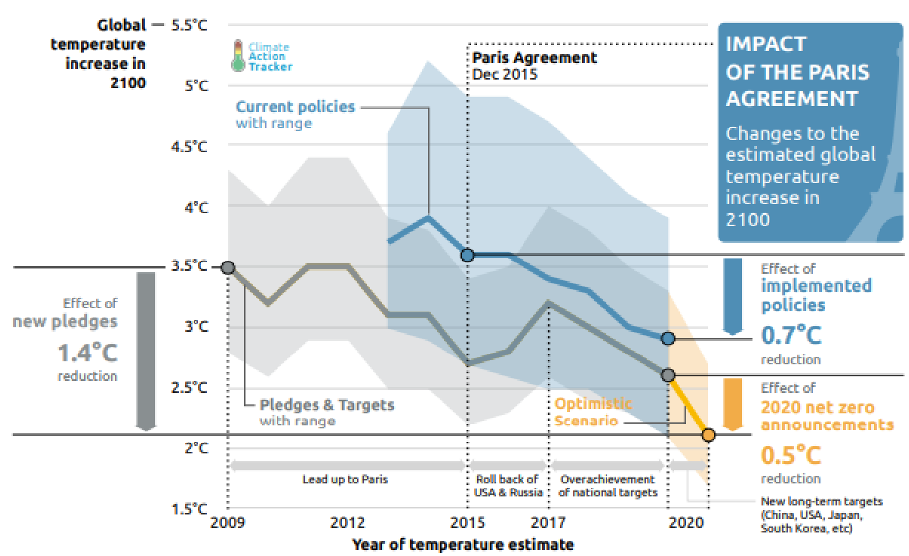
- **End of century warming estimates for targets have fallen in total by 1.4°C through Paris pledges ("pledges & targets" scenario), including by 0.5°C due to the new net zero targets ("optimistic" scenario):** When the Tracker began analyzing the effect of "pledges & targets" on warming in 2009, the estimate for end of century warming was 3.5°C. Following the 2015 Paris Agreement, this estimate fell significantly to 2.7°C. It then rose back above 3.0°C in conjunction with the US and Russia abandoning their targets, but has fallen again in recent years along with real world emission trends and currently stands at 2.6°C. And if all 127 countries with net zero targets (agreed or under discussion) were to achieve these goals ("optimistic" scenario), the estimate for 2100 could be as low as 2.1°C.

- **2021 could be the year the warming gap between "current policies" and "pledges & targets" begins to close:** Clearly the "current policies" need to step up considerably to get the world on a <2.0°C pathway. This is likely to be triggered with governments adopting stronger 2030 targets (i.e., Nationally Determined Contributions, or NDC) leading up to the 2021 United Nations Climate Change Conference (i.e., COP26) in November. Notably, as part of re-joining the Paris Agreement under President Biden, the US will resubmit its 2030 NDC ahead of the Leaders' Climate Summit on April 22nd. With Biden vowing to reestablish the US as a global climate leader, this is likely to be an ambitious target that not only sets the tone for the US but also for other countries around the world.

Global Share of GHG Emissions Covered by Countries that Have Announced/Considering Net Zero Targets



Change in Estimated Global Temperature Increase in 2100



Source: Climate Action Tracker, Credit Suisse research

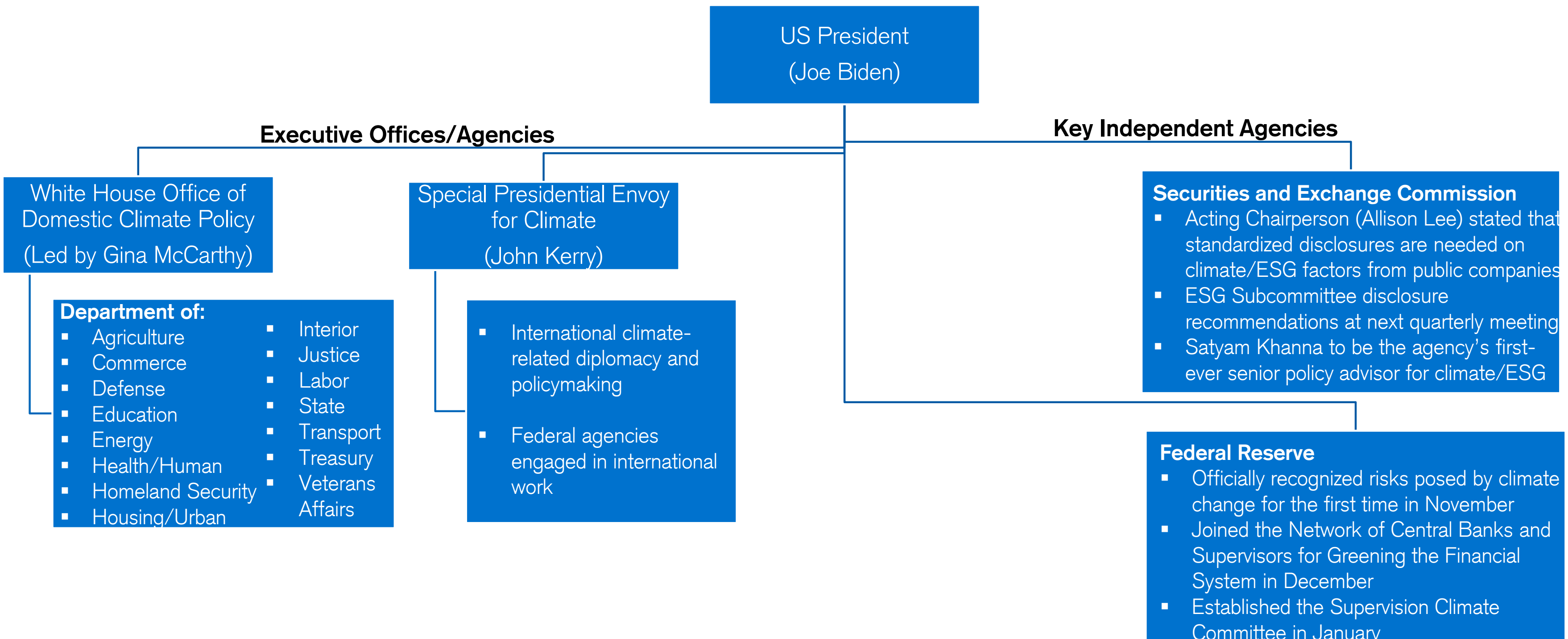
US “Whole-of-Government” Approach to Tackle Climate Change

While the US (at a federal level) is in the early days of setting and implementing climate- or ESG-related policies, **the “shift” in this direction is becoming increasingly clear from both direct orders from the President and movement from key independent agencies** where the President cannot directly control rulemaking but can insert some level of influence through leadership role nominations that require Senate confirmation:

- **Executive offices/agencies:** President Biden has taken steps to ensure climate will be an essential part of all *executive* agency policy considerations (both domestically and internationally). This is being enforced by the establishment of the White House Office of Domestic Climate Policy and Special Presidential Envoy for Climate. The **Treasury Department** in particular will focus on climate-related financial system risks and tax policy.

- **Key *independent* agencies:** The **Securities and Exchange Commission** (SEC) will likely have a three-to-two Democratic majority for commissioners and is expected to move towards adopting mandatory uniform and prescriptive ESG disclosures for public companies. Meanwhile, the **Federal Reserve** central bank is currently laying the groundwork to incorporate climate risk considerations into its mandates, which we expect may ultimately transpire into climate-related stress tests that could further impact banks’ willingness to lend to emission-intensive-industries (although unlikely in the near-term).

Climate- or ESG-related Policies Will be Flowing Through Both Executive and Independent Federal Agencies in the US



Source: Credit Suisse research, Whitehouse.gov, SEC.gov, Federalreserve.gov

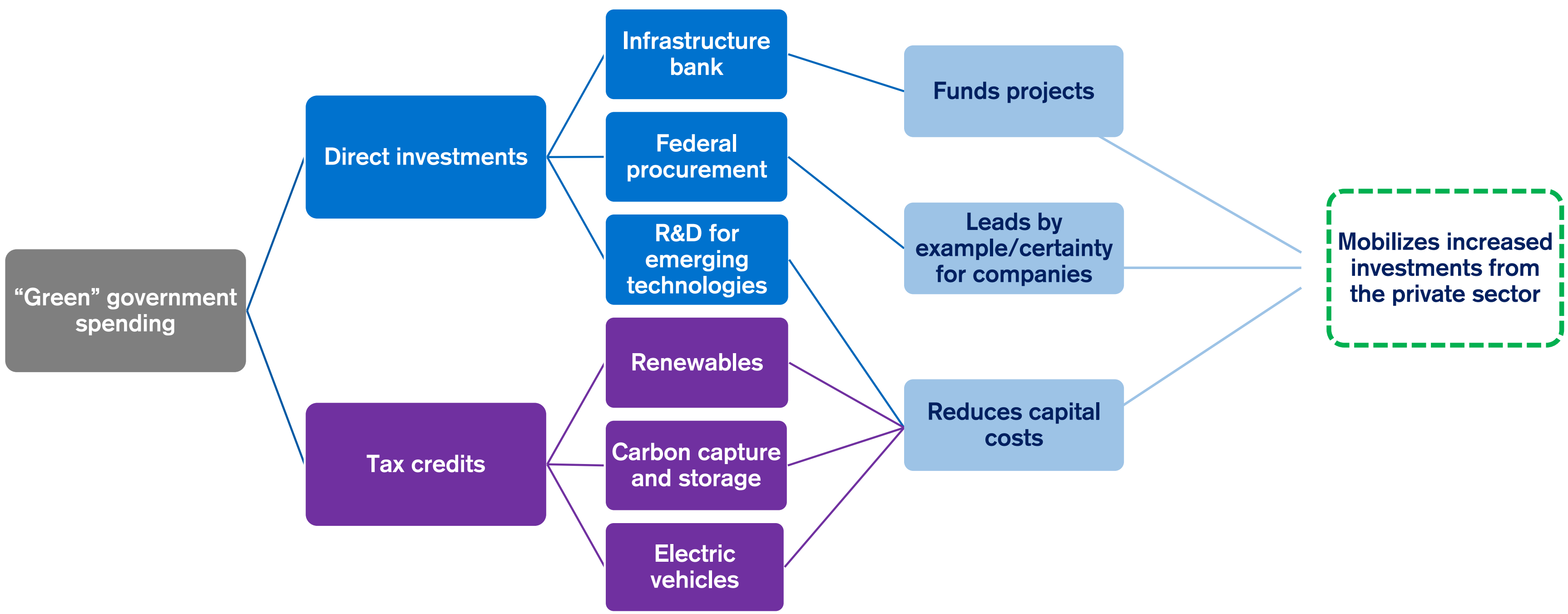
Putting Public Money to Green Purposes Incentivizes Private Money

In addition to putting in place regulation and policies, the government can influence a sustainable agenda through it's spending activities. This typically comes in the form of **direct investments into projects/goods/R&D and tax credits which can lead to a "snowball effect"** of spurring increased investments from the private sector (typically has a multiplier effect of ~2-3x). Below we highlight the key "green" fiscal developments being discussed in the US:

- **Direct investments:** President Biden is expected to announce details around the **infrastructure/clean energy proposal (aka green stimulus)** likely in March. This federal contribution will likely be placed in a so-called infrastructure bank which is then levered up by public/private partnerships to increase the overall level of investment towards green projects. Additionally, the proposal is expected to include **R&D investment** in areas such as battery technology, carbon capture and storage, the "the "next generation" of building materials, renewable hydrogen, and advanced nuclear reactors. Biden has also directed federal agencies to **procure carbon-free electricity and zero-emission vehicles**.

- **Tax credits:** key areas being discussed that seem to have bipartisan support include **1)** further extending the **investment tax credit for new solar and fuel cell projects and production tax credit for new wind projects**, and perhaps implementing a standalone battery storage tax credit; **2)** extending the **electric vehicle (EV) tax credit** ($7,500), although Biden's plan is expected to put in place a $250k household income limit and only apply to US-made EVs; and **3)** extending the **45Q tax credit for "qualified" carbon capture and storage** facilities.

The US Government's Green Spending Approach Should Spark More Investments from the Private Sector



Source: Credit Suisse research

Themes Poised to Benefit the Most from Green Stimulus to Date

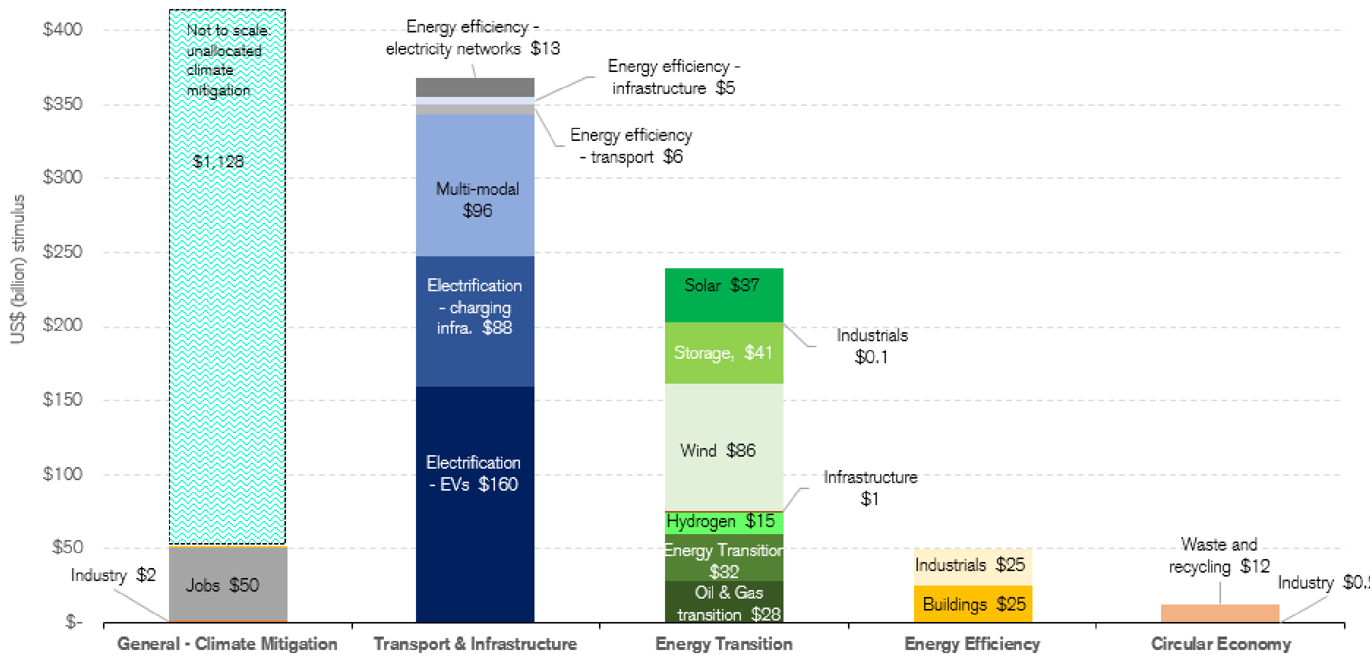
While we await the details and confirmation of Biden's imminent stimulus package focused on sustainable infrastructure (e.g., public transportation powered by electricity and clean fuels, electric vehicle charging stations, upgrading commercial buildings and weatherizing homes, expanding 5G, etc.) and clean energy R&D, we highlight **the US$1.85 trillion of global government green stimulus packages** (led by the EU) announced to date:

- Our analysis of confirmed spending plans to date reveals that the theme of **Transport and Infrastructure is the biggest recipient to date** (US$368 billion), with the sub-theme of EVs seeing the biggest policy support globally (US$247 billion). This is followed by measures to accelerate the energy transition away from fossil fuels (US$240 billion), with the **sub-theme of Renewables being the largest beneficiary** (US$159 billion).

- **Energy Efficiency and Circular Economy funding pledges have been more modest to date** at US$50 billion and US$12 billion, respectively, with the latter seeing a lift in funding pre-COVID. Interestingly, we find that US$1.1 trillion of announced green funding has yet to be directed to specific end-markets, portending more positive funding catalysts from here.

- For more details on our green stimulus analysis, please see the team's recent update note here: *Updating Credit Suisse's Estimates of Global Green Stimulus* which has a link to the original note that includes a list of stocks with exposure to each theme.

Confirmed Global Green Stimulus by Theme



Source: Credit Suisse research

Sustainable Investing in Fixed Income Markets

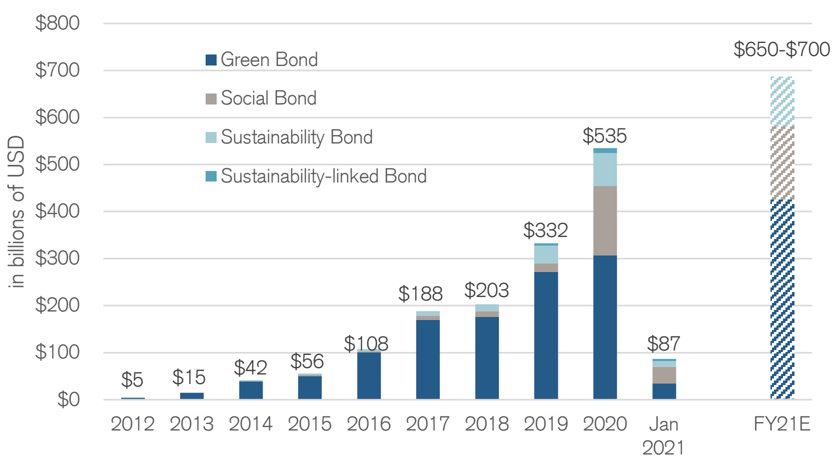
Sustainable Bond Market Continues to Grow and Evolve

Since 2012, there have been **~$1.6 trillion of cumulative global sustainable bond issuances** (i.e., green, social, sustainability, and sustainability-linked), over half of which was issued in the last two years. While this is remarkable growth, the sustainable bond market still makes up just a tiny portion of the **global fixed income market of ~$128 trillion**. Thus, given growing interest in ESG-related investments coupled with increasing "net zero" commitments from asset owners/managers, companies, and governments, **plenty of growth still lies ahead for these instruments**. Green bonds will likely continue to account for the lion's share of new sustainable bond issuances; however, an emerging breed of sustainable bonds (i.e., sustainability-linked and transition) that can cater to a broader set of companies and sustainability-minded investors have the strongest growth potential going forward.

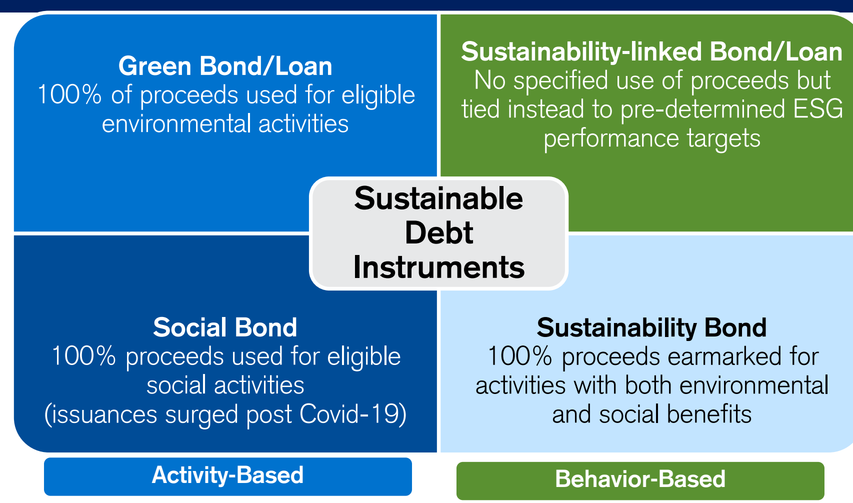
- **Green bonds dominate, but social bonds were the story of 2020:** In the prior decade, the sustainable bond market was dominated by new **green** bond issuances which have grown from ~$4 billion in 2012 to ~$272 billion in 2019, accounting for ~80-90% of the new sustainable bond issuances each year over this time period (based on BloombergNEF data). However, the theme of 2020 was the surge in new **social** and **sustainability** bond issuances due to COVID-related financings, leaving new green bond issuances at ~57% of the total (albeit still up ~13% YoY to ~$307 billion). Most notably, new social bond issuances exploded from ~$18 billion in 2019 (record year at the time) to ~$148 billion in 2020.

- **Next leg of growth broadens market scope:** Robust growth from the sustainable bond market should continue as investors/companies join forces to meet ambitious decarbonization targets and governments around the world use green stimulus packages for economic recovery plans (notably the EU). In 2021, Moody's forecasts new green, social, and sustainability bond issuances will collectively reach ~$650 billion (up ~30% YoY), although we already saw ~$87 billion of new sustainable bond issuances in January. And if the theme of last year was impressive growth from social bond issuances, we think the theme going forward will be the rise of **sustainability-linked** (already did ~40% of last year's level in January alone) and emerging **transition** bonds as related disclosures/standards improve and the tidal wave of funds heading towards sustainable activities will need to spread out between low- or no-carbon 'green' solutions (i.e., green bonds) *and* decarbonizing certain 'brown' activities (i.e., sustainability-linked and transition bonds).

Global Sustainable Bond Issuances (2012-2021E)



Varieties of Sustainability-Themed Debt Market Issuances



Source: BloombergNEF, Moody's Investor Services, Credit Suisse research

Lower Cost of Capital for Sustainable Debt Issuances

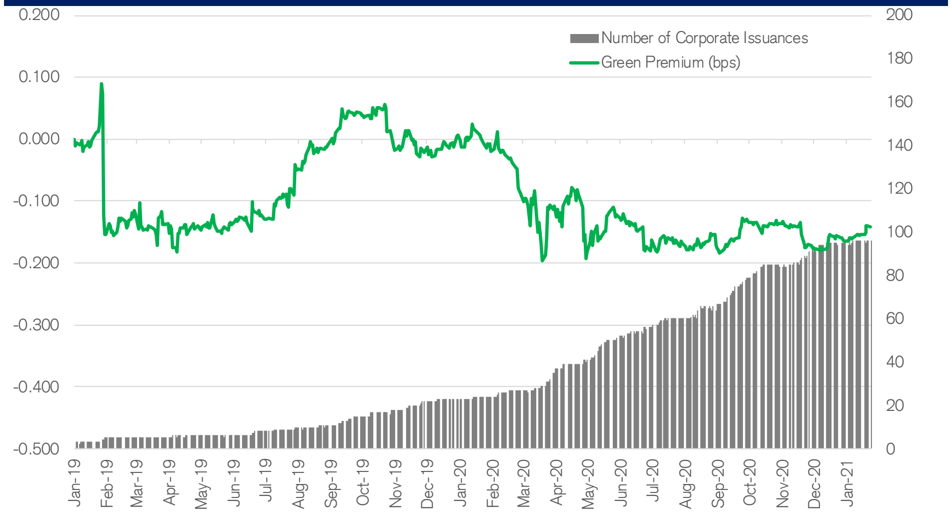
- **Sustainable bonds showing consistent spread premium to conventional debt of similar maturity for the same issuer:** We looked at all global corporate sustainable (mostly green) bond issuers that also have conventional bonds with similar maturities and compared their yield-to-maturities (YTM). Notably, on average **sustainable bonds have enjoyed a consistent premium of ~10-20 bps over their conventional counterparts** since early 2019 (and recently towards the upper-end of this range along with more issuances). Given sustainable bond issuances are rated by credit agencies and carry the same credit rating as the issuer, this **"greenium" is largely due to technical reasons**: demand overwhelming supply (typically are oversubscribed at issuance) and the surge from sustainable fund flows.

- **Absolute yield also lower than broader IG bond market:** Not only do sustainable bonds enjoy a premium on a relative basis, but they are also at a (growing) premium on an absolute basis. The green bond index is trading at a YTM of just 0.4%, underscoring the extremely low cost of capital for sustainability-aligned activities.

- **More attractive financing comes with more stringent criteria:** While technically any government or business entity can issue green bonds, the criteria for issuance is stricter with some additional transaction costs compared to conventional bonds. Companies generally need to already have a **holistic ESG/transition strategy in place** with science-based interim and long-term targets aligned with the Paris Agreement, and **publish a green bond framework** (along with first issuance) based on the International Capital Market Association's (ICMA) Green Bond Principles, which demands transparency around: 1) use of proceeds towards "eligible" green projects; 2) process for project selection; 3) management of proceeds; 4) progress reporting/use of proceeds; and 5) assurance from an external reviewer. That said, repeat green bond issuers in particular can offset these initial costs with benefits including lower financing expenses and a more diversified investor base.

- **Financial institutions and utility/power generation companies dominate corporate green bond market:** Not surprising as the former is responsible for financing large-scale energy transition projects and the latter most advanced in developing those projects. However, other sectors have also been contributing to the rise in green issuances, namely **materials, consumer discretionary, and communications** which collectively increased by >50% in 2020 vs. 2019, according to Bloomberg data. Meanwhile, sustainability-linked and transition bonds are further broadening the scope of companies that can access the sustainable bond market.

Sustainable Bond Yield Premium vs. Conventional Bond (Same Issuer)



Global Green Bond Yield-to-Maturity vs. Market

Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse research

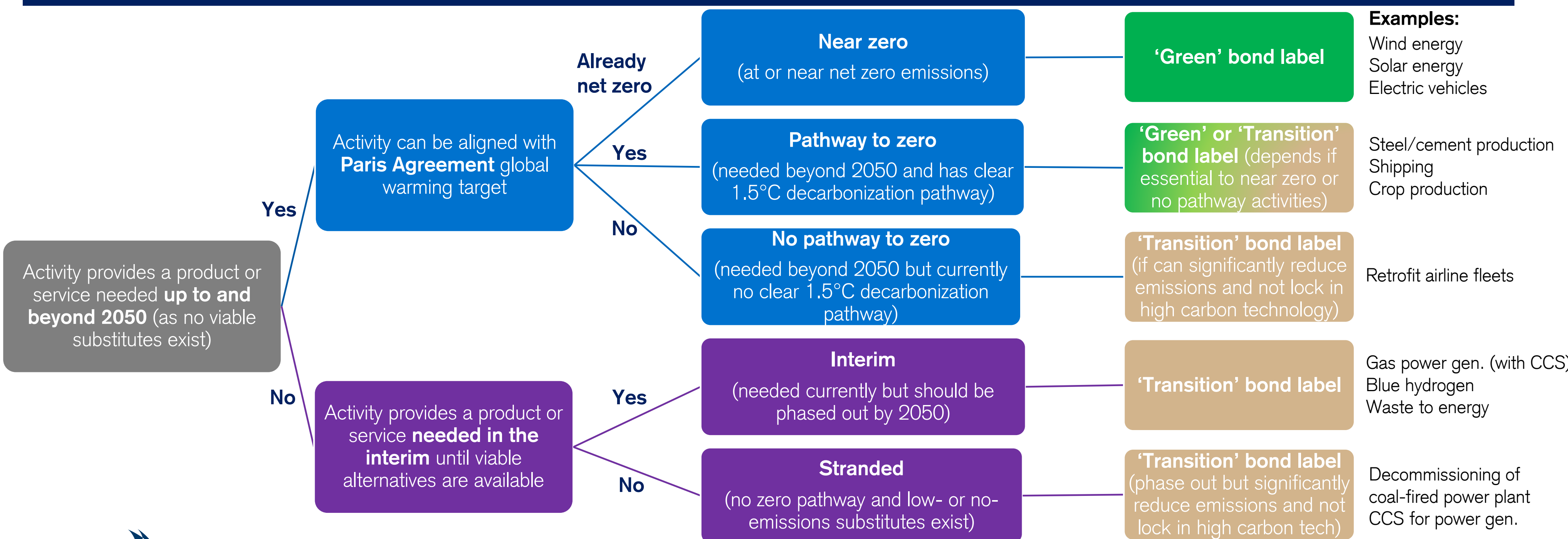
Spotlight on Transition Bonds: The Next Wave of Sustainable Financing

Given the increasing sense of urgency to halve global emissions levels by 2030, the energy transition needs to be about both **shifting to low- or no-carbon 'green' solutions that viably exist *and* decarbonizing certain 'brown' activities**. That said, heavy emitters without opportunities *yet* to transition into low- or no-carbon solutions but that can substitute for lower-emission activities have largely been unable to tap the 'green' finance market. Such activities fall under the 'transition' bond label which has remained a tiny, niche category of the sustainable debt market due to a lack of robust disclosures by the issuer and standards defining a Paris-aligned transition project/activity. However, with the ICMA and CBI closing these gaps, we expect to see a **new leg of sustainable financing growth** from the transition bond market.

- **The International Capital Market Association (ICMA) provides *disclosure* guidance:** In December, the ICMA published its handbook for climate transition financing which provides guidance for issuers on how to make robust disclosures and set standards concerning a company's transition strategy. The recommended disclosures revolve around the issuer disclosing its climate transition strategy (including alignment with goals of Paris Agreement and science-based trajectory with targets and interim milestones) and the specific details for the investment/project the climate transition debt instrument will be financing.

- **The Climate Bonds Initiative (CBI) provides a framework for *identifying transition* projects:** In September, the CBI published its white paper on financing credible transitions which defines transition as a concept and provides a framework for use of the 'transition' label. The CBI notes the 'transition' label can be used for "eligible" investments (i.e., meet five principles laid out in the paper) that: 1) are making a substantial contribution to reducing emissions but will not have a long term role play; or 2) will have a long term role play but no meaningful decarbonization pathway exists currently. We provide its framework and some examples below.

The Climate Bonds Initiative's Framework for Identifying Activities that Can Use the 'Green' or 'Transition' Bond Label



Source: International Capital Market Association, Climate Bond Initiative, Credit Suisse research

Recent Notable Examples of Sustainability-linked and Transition Bonds

- When the first **sustainability-linked bonds** (SLBs) were launched by Italy-based international energy company Enel in September and October 2019, there was some investor skepticism (despite strong demand) around the new structure given it lacked transparency and accountability of how proceeds will be used which is required for green bonds. However, two subsequent events effectively validated their legitimacy: 1) in June 2020, the ICMA published the Sustainability-Linked Bond Principles; and 2) in September 2020, the European Central Bank announced SLBs will be eligible as collateral for Eurosystem credit operations starting this year. Since September 2020, the global cumulative new SLB issuances has reached ~$14 billion (through January 2021), more than double the ~$6 billion the market issued over the prior 12 months. Following in similar footsteps, only 13 **transition bonds** have been issued globally since the first one was issued in 2017, but should gain increasing credibility.

- We'd note SLBs in particular are starting to move beyond the "typical" green bond issuer (e.g., those with the opportunity to transition to renewables or electric vehicles), notably **LafargeHolcim** the first building materials company and **Total** the first oil and gas producer (applies to all new bond issuances going forward) with the former's bond being >3x oversubscribed (see table below). We think this is just the start of a broader (and "browner") set of companies tapping the sustainable bond market.

Recent Notable Examples of Companies Successfully Issuing (or Announcing Plans to Issue) SLBs and/or Transition Bonds

Company	Sector	Bond Type	Deal Information					Bond Characteristics					Importance
			Issue Date	Maturity	Amount	Order Book	Coupon	Use of Proceeds	Performance Indicator	Sustainability Performance Target (SPI)	SPI Deadline	Coupon Increase if Miss SPI	
Enel	Utilities/Power Generation	Sustainability-linked	Sept. 2019	Sept. 2024	USD 1.5bn	USD 4bn	2.65%	General corporate purposes	Installed renewable generation capacity (as % of total installed capacity)	At least 55%	YE2021	0.25%	World's first SDG-linked bond (placed in USD)
			Oct. 2019	June 2024	EUR 1.0bn	EUR 10bn	0.0%						Europe's first SDG-linked bond
				June 2027	EUR 1.0bn		0.375%						
				Oct. 2034	EUR 500MM		1.125%		Direct GHG emissions	At least below 125 gCO_2/kWh	YE2030		
			Oct. 2020	Oct. 2027	GBP 500MM	GBP 3bn	1.0%		Installed renewable generation capacity (as % of total installed capacity)	At least 60%	YE2022		Sterling market's first SDG-linked bond
LafargeHolcim	Building Materials/Cement	Sustainability-linked	Nov. 2020	Apr. 2031	EUR 850MM	EUR 2.6bn	0.50%	General corporate purposes	Direct GHG emissions	At least below 475 $kgCO_2/t.cem$	YE2030	0.75% (one time at maturity)	World's first SDG-linked bond for the building materials sector
NRG Energy	Power Generation	Sustainability-linked	Dec. 2020	Dec. 2027	USD 900MM	NA	2.45%	General corporate purposes	Absolute GHG emissions (Scope 1,2, and 3)	At least below 31.7 $MtCO_2e$	YE2025	0.25%	North America's first SDG-linked bond (and by an energy company outside of Europe)
Total	Energy/Oil & Gas	Sustainability-linked	*All new bond issuances going forward will be linked to its sustainability targets*					General corporate purposes	Absolute and/or intensity GHG emissions (Scope 1,2, and 3)	Reduce Scope 1 and 2 40% and Scope 3 30% by 2030 (vs. 2015 levels); net zero by 2050	NA	NA	First company to announce it is fully linking debt and sustainability plans
Snam	Utilities	Transition	June 2020	June 2030	EUR 500MM	EUR 1.5bn	0.75%	"Eligible projects" related to retrofits of gas transmission network, carbon & emission reduction, biomethane plants, energy efficiency, and/or green buildings(1)	NA	NA	NA	NA	Most active company in the transition bond market over the last two years; second bond is longest 'zero coupon' ever issued by an Italian corporate
			Nov. 2020	Nov. 2028	EUR 600MM	EUR 2.6bn	0.00%						

Source: Company documents, Credit Suisse research
(1) See Snam's Transition bond framework for more details on the description and criteria for its "eligible projects"

Sustainable Investing in Equity Markets

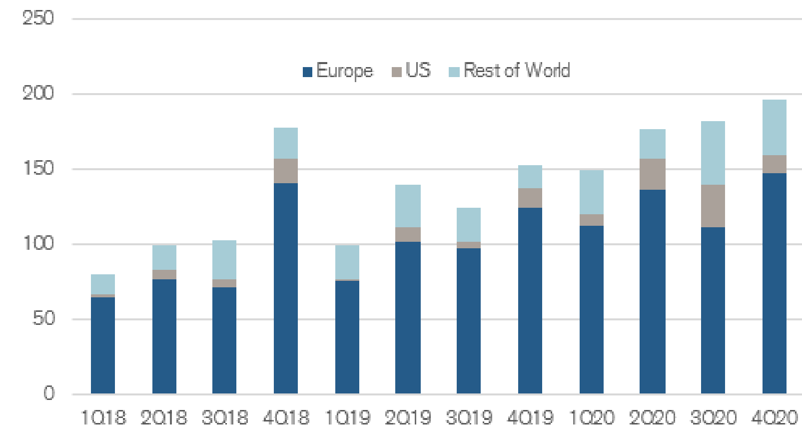
ESG Fund Flows Continues to Grow Driven by Outperformance

- Global **net inflows into sustainable- or ESG-labelled mutual funds and ETFs continue to set new records each quarter**. In 4Q20, this universe attracted ~$152 billion in net inflows, which comfortably exceeded the previous quarterly record (set in 3Q20) of ~$83 billion, according to Morningstar data. Europe continues to dominate with ~79% of the fund inflows from last quarter, although the US seen steady growth from just ~$1.5 billion per quarter in 2018 to >$20 billion during 4Q20. These fund flows are just related to explicitly labelled ESG funds and exclude a large portion of the market that are integrating ESG considerations in all investment processes.

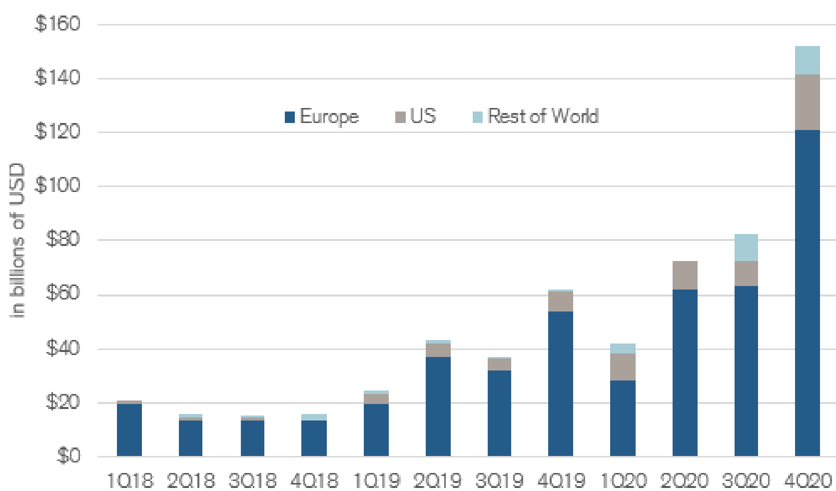
- Similarly, ***new* launches of global sustainable- or ESG-labelled mutual funds and ETFs have steadily grown** over the last few years with Europe again accounting for the lion's share. The 196 new fund launches in 4Q20 broke the previous record of 182 set in the prior quarter. We'd note this figure does not include *repurposed* funds that rebrand to add terms such as *sustainable, ESG, green*, or *SRI* to their names as a way to increase their visibility among investors who are looking to invest more sustainably. For example, in Europe, Morningstar identified ~250 such funds last year alone.

- While increasing awareness of climate change and social issues are driving forces, the strong performance of ESG indexes (particularly during the pandemic-driven downturn early last year) has provided additional fuel to mobilize fund flows. 'ESG Focus' indices, as defined by MSCI, have **outperformed by 310bps in the US, 380bps in Europe and 430bps in EM** since early 2020.

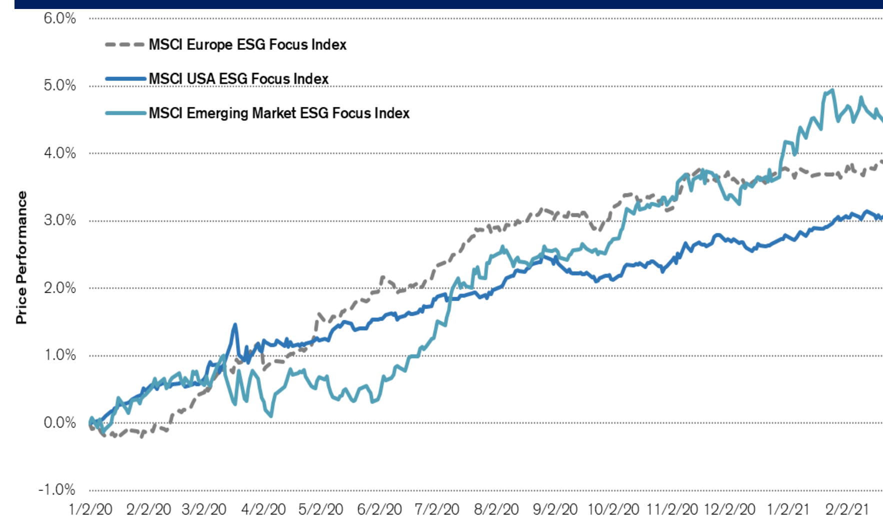
New Launches of Sustainable- or ESG-labelled Mutual Funds and ETFs(1)



Net Inflows into Sustainable- or ESG-labelled Mutual Funds and ETFs(1)



MSCI ESG Index Performance Since 2020 Relative to Benchmarks(2)



Sources: Morningstar, the BLOOMBERG PROFESSIONAL™ service, and Credit Suisse research
(1) Does not include funds that employ exclusionary screening nor that formally use ESG integration; 2) Relative benchmarks are MSCI Europe, MSCI USA and MSCI Emerging Markets

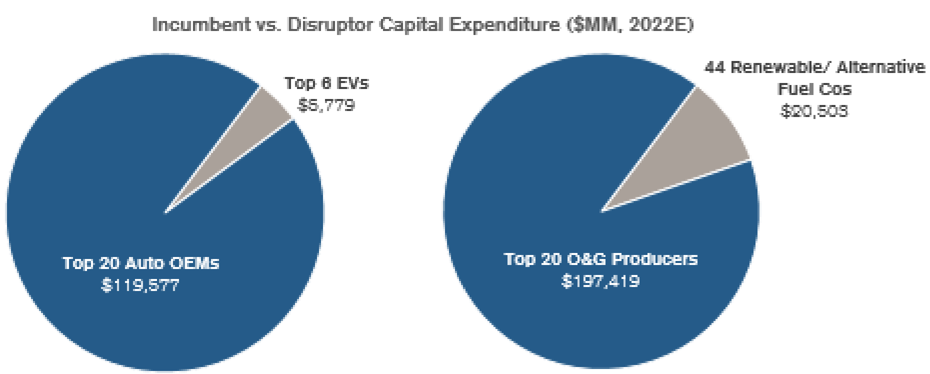
Many Target Areas for Sustainability Fund Flows

- **Pure-play ESG investment themes (aka industry disruptors) will continue to command a premium valuation:** We believe this is due to: **1)** the sheer scope of future ESG fund flows chasing a limited number of opportunities; **2)** escalation of government sustainability goals and regulatory support; and **3)** long term growth trajectory of sustainability-themed businesses (from hydrogen, electric mobility to building automation). The pure-play nature of these businesses means sustainability impact is easily identifiable and measurable with maximized exposure to key growth drivers.

- **Industry transition is inevitable given broad-based pressure, presenting opportunities in early transition leaders:** The sheer scale of sustainability investment needs means it cannot be met alone by industry disruptors. For instance, **the six largest electric vehicle companies have a combined market cap that is 92% of the 20 largest traditional auto OEMs while their aggregate annual capex accounts for just over 4% of the OEM's capex**. Similarly, a **global group of 44 renewable energy/alternative fuel companies have a combined market cap that make up more than a third of the world's 20 largest oil & gas producers while spending ~10% of their capital**. While investors are concerned about transition investment returns in emerging sectors, companies that are serious about the transition can tap into a growing sustainable debt market and benefit from ESG fund flows.

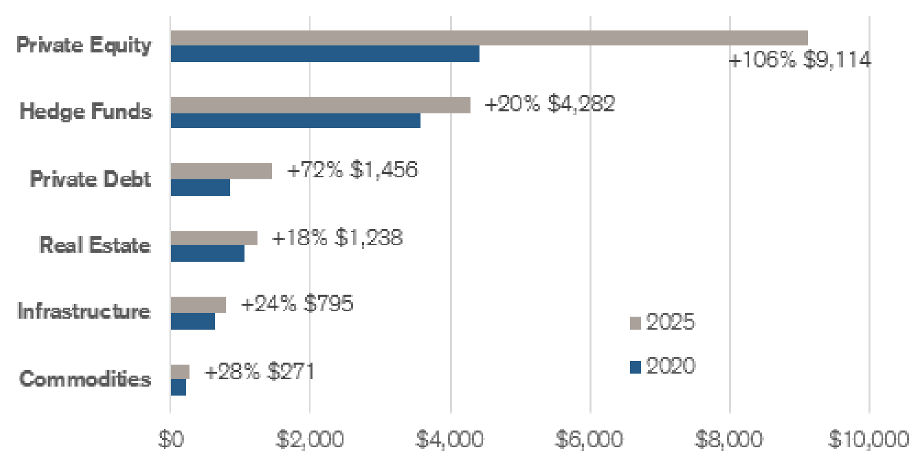
- **Sustainability investments increasing in private equity/venture capital markets:** AUM growth in alternative assets is **expected to outpace public markets as investors seek excess return and diversification (Preqin forecasts AUM to increase by ~60% to $17 trillion by 2025).** Sustainability investments are well suited to capture growth in private equity, private debt and infrastructure assets, particularly given financing needs to support early stage innovations and emerging market opportunities. The rich public market valuation and broadening of exit pathways (i.e., via SPACs) could further incentivize private investments into a wide range of sustainability-themed new business models.

Sustainable Investments Also Have to Come from Industry Incumbents



Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse Research

Projected Growth in Alternative AUM ($bn), 2020 vs 2025



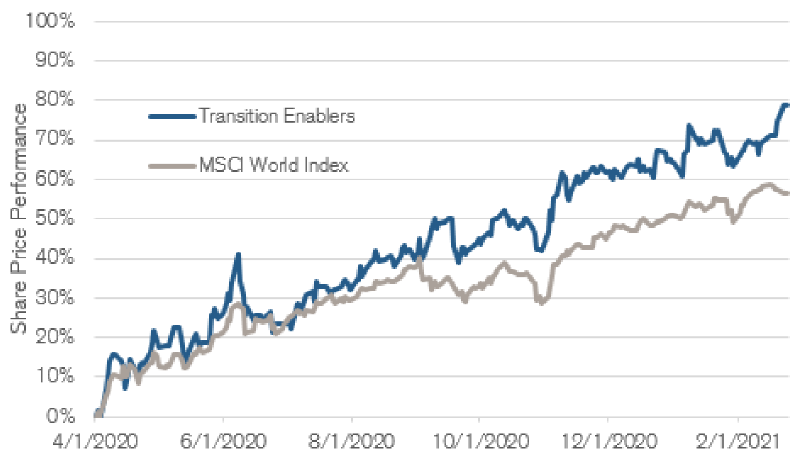
Source: Preqin

Room for Both Transition Enablers and Transition Leaders

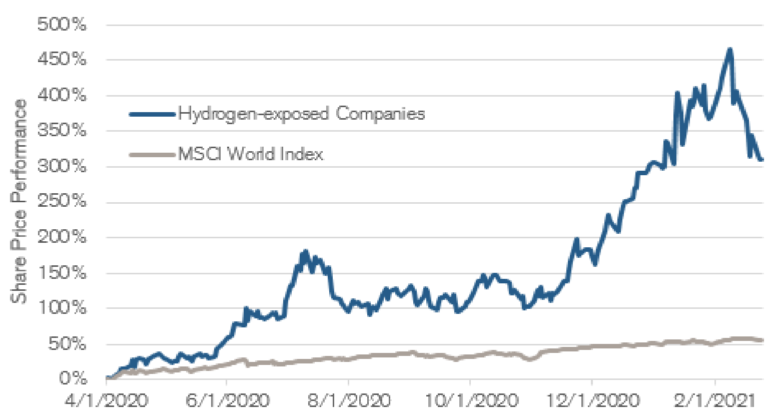
As we highlighted in our energy transition launch report in September, we see the greatest potential for differentiated investment ideas (i.e., high rate of change potential) in **"transition enablers"** and **"transition stories"** within carbon-intensive industries.

- **Transition enablers:** companies that benefit from growing demand for products and services that support the energy transition – can be ***pure-play*** **transition companies** (e.g., EV manufacturers, solar/wind developers, fuel-cell/hydrogen providers, etc.) or ***incumbent companies with new demand growth opportunities*** as they provide environmental solutions or inputs/parts used for the aforementioned products (among others). Shares of **both groups have generally been surging** since April at least in part due to rising demand for sustainability.
- **Transition stories:** companies within **carbon-intensive industries that have the ability to pivot to low-carbon alternatives**. However, as we are seeing in the US utility/power generation and Euro integrated oils sectors, it's not enough to just make ambitious commitments due to transitioning's long time horizon and execution risk. Companies also **need to show tangible and meaningful progress combined with the demand-side being "ready" for this increased supply**. For example, recently General Motors and Ford both meaningfully stepped up their financial commitments to EVs and announced plans for new models at the same time EV demand is accelerating. **After years of significantly underperforming Tesla, GM and Ford have outperformed meaningfully YTD at least in part due to these evolving narratives**. Thus, just because there is no obvious share price performance distinction today for companies in transition, doesn't mean there won't be in the future.

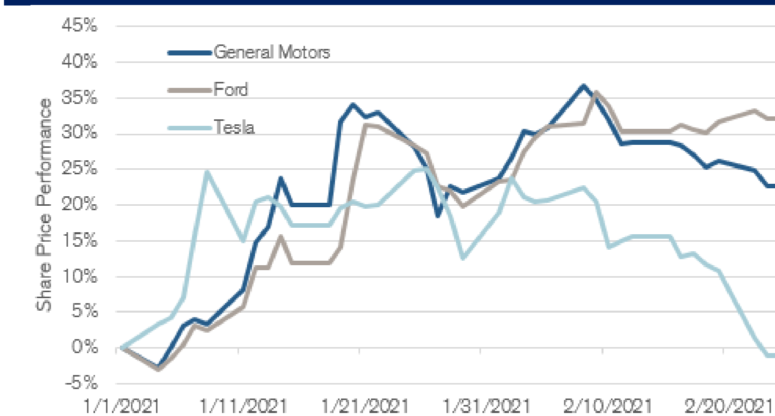
Incumbent Transition Enablers Are Also Outperforming



New Growth "Pure-play" Areas Are Being Re-Priced



Transition Stories Also Have the Potential to Outperform Peers



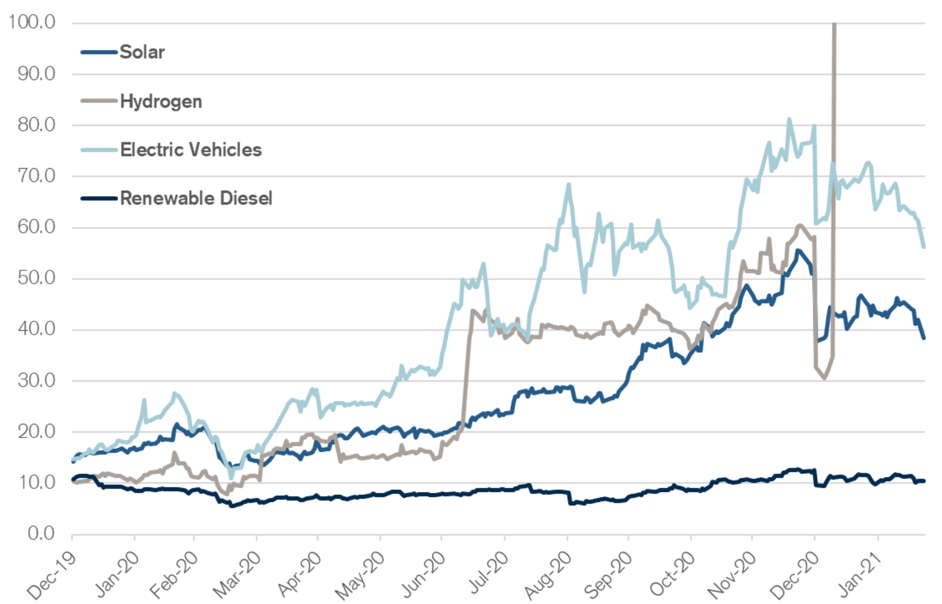
Sources: the BLOOMBERG PROFESSIONAL™ service, Refinitiv and Credit Suisse research

Wide Valuation Gap Among Pure-Play and Diversified Transition Enablers

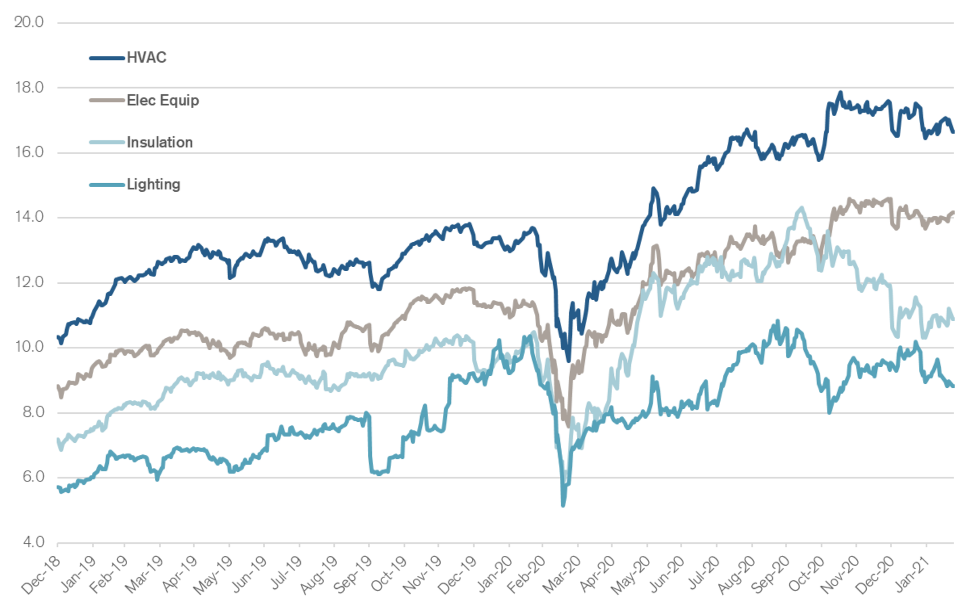
- Given explicit government funding/policy support for pure-play climate technologies and solutions coupled with the surging sustainable fund flows from investors, the **pure-play transition companies (e.g., renewables, hydrogen, electric vehicles, etc.) have seen their multiples skyrocket over the last year.** For instance, the 2022 EV/EBITDA multiples for solar and electric vehicles/TSLA increased four- and five-fold to >50x and >70x, respectively, during 2020. Even with the pullback this month, they are still trading at ~40-55x. Meanwhile, **pure-play renewable diesel companies (e.g., REGI and DAR) have seen relatively little change to their 2022 EV/EBITDA multiples** despite Biden's EPA likely to encourage (or even force) more use of renewable fuels and administration being more supportive of states implementing their own low carbon fuel programs.

- On the other hand, certain **diversified or incumbent transition enablers - such as those related to improving energy efficiency of new and existing buildings which is required to achieve global climate ambitions – have seen more modest multiple expansion** largely in line with the S&P 500 Index. We'd also note that the related sectors (e.g., HVAC, electrical equipment, insulation, and lighting) generally have fairly modest mid-single-digit sales growth consensus projections which essentially imply no uplift from historical trend despite the emerging "renovation wave" push from countries such as the EU and US. Names that are favored by our sector analysts include **SIEGn** and **SCHN** in the automation and controls sub-industry, **TT** in the HVAC group and **EMR** specifically for heat pumps, **IBP** for insulation and install services, and **AYI** for lighting. The trends of electrification (e.g., buildings, vehicles) and energy transition are also significant opportunities for **ETN**, where ~70% of sales is related to electrical sectors. For more on this topic, please see our note: *Transforming Buildings - An Underappreciated Driver of Global Decarbonization*

Valuation (FY2 EV/EBITDA) of Select *Pure-Play* Transition Enablers



Valuation (FY2 EV/EBITDA) of Select *Diversified* Transition Enablers



Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse research

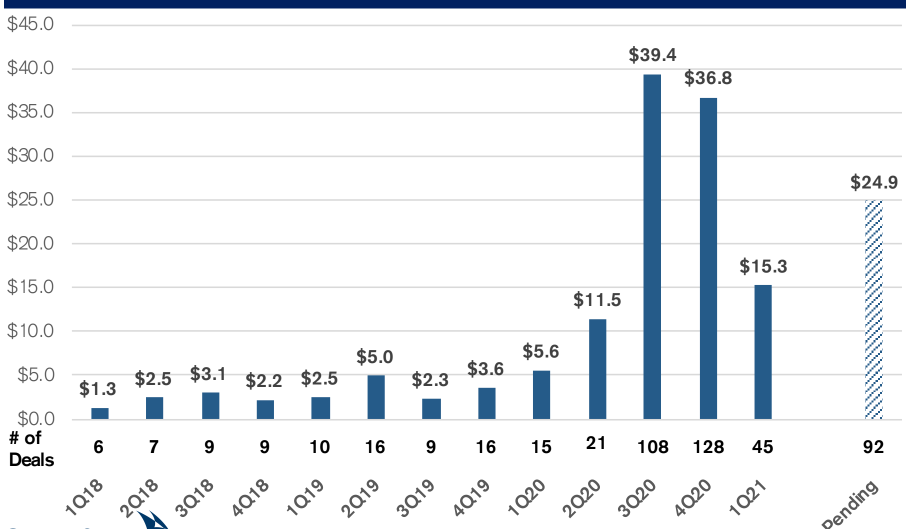
(1) Performance based on Indxx SPAC & NextGen IPO Index - passive rules-based index that tracks the performance of newly listed SPACs and IPOs derived from SPACs

SPACs Help to Build Momentum on Sustainability-Themed Investments

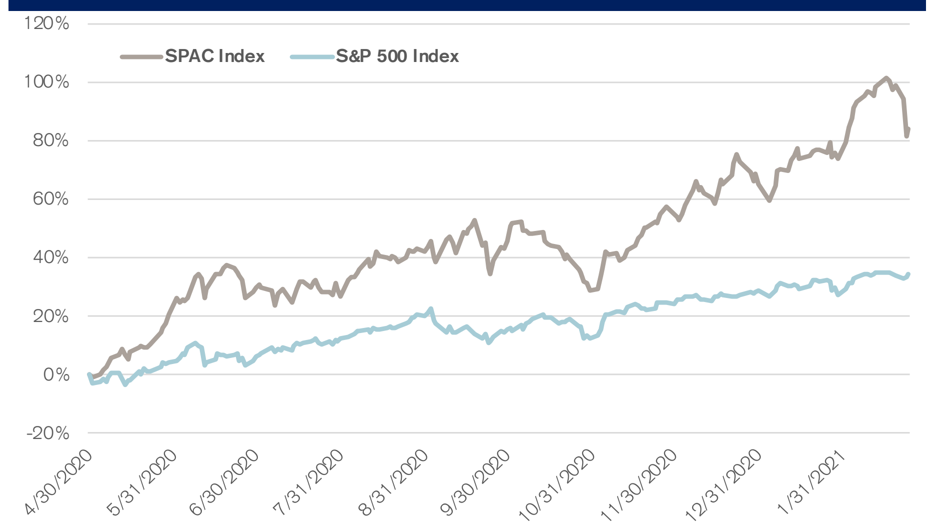
Special Purpose Acquisition Companies (SPACs) are formed to raise capital for the sole purpose of acquiring primarily private companies, typically within 18-24 months of the IPO. SPACs have seen a meteoric rise over the last 12 months (from 51 deals for $13.5 billion in 2019 to 272 deals for $93 billion in 2020 and 45 additional deals just in Jan/Feb of this year) and the quantity and quality of the SPAC deals today are reshaping the role of high-growth, venture backed companies in the public market.

- **What made 2020 the breakout year for SPACs? 1) Big name investors and high-profile target companies:** such as Bill Ackerman of Pershing Square raising a $4 billion SPAC (largest to date) and at least 8 companies with >$15 billion market cap have or are in the process of becoming public through a SPAC legitimizes the vehicle as an alternative to IPO; **2) attractive public market valuation:** market's willingness to value companies based on projections many years out are incentivizing early growth companies to tap the public market for capital access; **3) low interest rates:** low cash yields reduce the opportunity cost of owning a pre-merger SPAC while investors retain optionality of having first look at a potential deal; **4) stock outperformance:** it's difficult to ignore the outsized performance of SPACs which have roughly doubled since 4/30/2020, nearly tripling the S&P 500, as acquired targets are increasingly in the desirable high growth, technology-focused areas.
- **Why is the SPAC market relevant for sustainability?** One key advantage of a SPAC over a traditional IPO is the ability to share growth projections and other forward looking statements that are critical for due diligence on emerging and sometimes pre-revenue companies. This feature is particularly attractive for sustainability-themed businesses which are often in the very early development stage albeit with high growth potential. It's notable that 6 US electric vehicle pure-plays came public via a SPAC just within the last year with at least 8 more in the works based on public statements. Many recently announced SPACs are aimed explicitly in the ESG space, making SPACs a unique source of pure-play investment vehicles in emerging sustainability themes.
- **Disruptive companies will continue to command high valuation:** The focus on sustainability is fundamentally changing how governments regulate, how companies invest and how consumers spend. This is creating investment opportunities across all areas of the economy with technology often at the center of that disruption. Innovation is happening rapidly with high potential for disruptive growth (e.g., hydrogen in 2020). Given a scarcity of pure-play exposure in the public market (that's why we believe sustainability investments will increase in the private space), those with differentiated technology and unique business models will continue to command a premium valuation particularly in light of increasing ESG fund flows.

Trend of SPAC IPO Issuances Since 2018 ($ billions)



Broader SPAC Index [1] Performance vs. S&P 500



Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse research

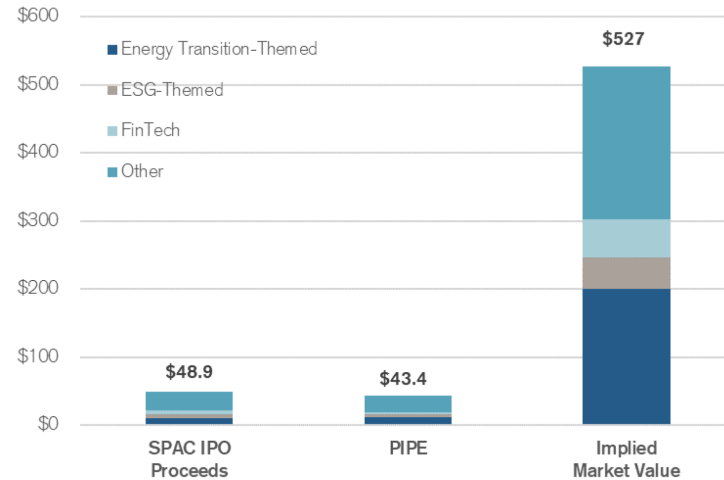
[1] Performance based on Indxx SPAC & NextGen IPO Index - passive rules-based index that tracks the performance of newly listed SPACs and IPOs derived from SPACs

Increasing Options in Sustainability-Themed Public Equities

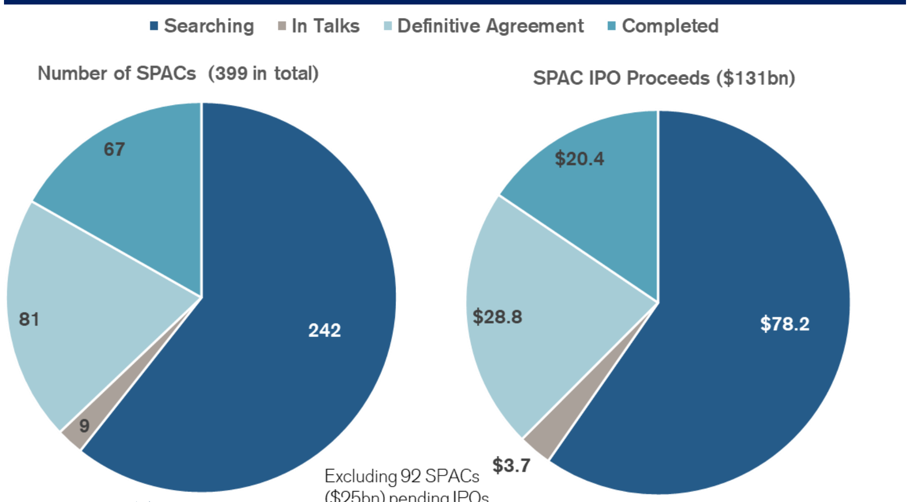
Our review of ~400 SPACs announced since 2018 showed that the recent surge in SPAC IPO issuances (i.e., number of companies searching for deals) will have meaningful implications to public markets, especially sustainability themed equities.

- **SPAC deals to date have had a >10x multiplier in market capitalization**: Our analysis of 157 SPACs that completed, signed an agreement, or are in talks for a transaction showed that what was originally ~$49 billion in SPAC IPO proceeds have resulted in >$500 billion in implied public equity value based on current share prices. This is reflective of the combined impact of the size of the target companies, appetite for private placements, and favorable stock outperformance.
- **Significant backlog of deals yet to come to the market:** There are 242 SPACs ($78 billion) currently searching for targets plus another 92 SPACs ($25 billion) that have filed for an IPO but not yet completed. This is a multiple of the aggregate mentioned above, inferring a significant increase in the number and the size of these future public equity investments.
- **ESG themes will be a key focus area for new SPACs given market interest:** It's notable that energy transition companies (e.g., electric mobility, energy storage, electric infrastructure) are the best performing SPACs (initially and over time) with deals on average more than doubled post announcement. This is followed by what we broadly define as ESG-themed companies (e.g., telehealth, healthy living, 3D printing etc) which are also up 80% on average. We note that several newly listed SPACs are specifically focused on environmental and social sustainability themes.

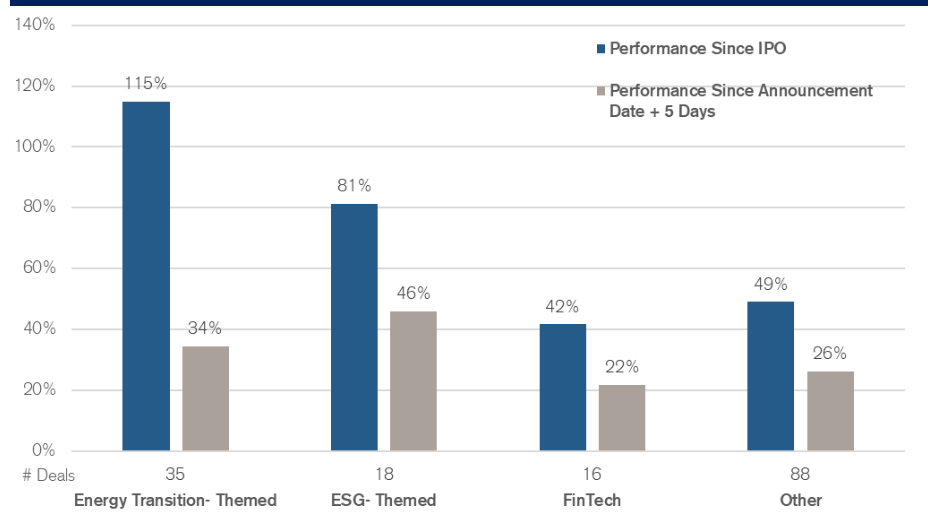
Implied Market Cap Size ($ billions)



Size of SPAC Market Based on Deal Stage



SPAC Performance by Target Company Type



Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse research

SPAC Deals(1) Focused on Energy Transition Theme

Deal Stage	Completed

SPAC Announced Date	SPAC Name	Ticker	Offer Size ($MM)	Last Price	Announced Date	Target Company	Area of Focus
6/9/20	QuantumScape Corp	QS US Equity	$230	$60.73	9/3/20	QuantumScape Corp	Energy Storage
4/23/20	Eos Energy Enterprises Inc	EOSE US Equity	$175	$21.86	6/24/20	Eos Energy Enterprises Inc	Energy Storage
3/6/20	MP Materials Corp	MP US Equity	$345	$42.90	7/15/20	MP Materials Corp	Rare Earth Mining
6/7/19	XL Fleet Corp	XL US Equity	$230	$15.18	9/18/20	XL Fleet Corp	Electrical Commercial Fleet
2/11/19	Canoo Inc	GOEV US Equity	$300	$14.17	8/18/20	Canoo Inc	Electric Vehicles
2/6/19	Hyliion Holdings Corp	HYLN US Equity	$233	$16.73	6/19/20	Hyliion Holdings Corp	Electric Vehicles
1/18/19	Lordstown Motors Corp	RIDE US Equity	$280	$21.35	8/3/20	Lordstown Motors Corp	Electric Vehicles
12/17/18	Romeo Power Inc	RMO US Equity	$230	$13.08	10/5/20	Romeo Power Inc	Energy Storage
10/25/18	Advent Technologies Holdings I	ADN US Equity	$221	$13.99	12/22/20	Advent Technologies Holdings I	Energy Storage
7/20/18	Fisker Inc	FSR US Equity	$552	$20.44	7/13/20	Fisker Inc	Electric Vehicles
4/19/18	Nikola Corp	NKLA US Equity	$230	$20.56	3/3/20	Nikola Corp	Electric Vehicles

Deal Stage	Definitve Agreement

SPAC Announced Date	SPAC Name	Ticker	Offer Size ($MM)	Last Price	Announced Date	Target Company	Area of Focus
7/14/20	Churchill Capital Corp IV	CCIV/U US Equity	$2,070	$35.44	2/22/21	Lucid Motors	Electric Vehicle
11/12/20	Rodgers Silicon Valley Acquisi	RSVAU US Equity	$230	$25.00	2/22/21	Enovix Corporation	Energy Storage
10/2/20	Atlas Crest Investment Corp	ACIC/U US Equity	$500	$15.44	2/10/21	Archer	Electric Aviation
9/25/20	10X Capital Venture Acquisition	VCVCU US Equity	$201	$13.08	2/3/21	REE Automotive	Electrical Vehicles
9/4/20	ArcLight Clean Transition Corp	ACTCU US Equity	$278	$27.10	1/13/21	Proterra	Electrical Vehicles
9/4/20	TPG Pace Beneficial Finance Co	TPGY/U US Equity	$350	$23.56	12/10/20	EVBox	EV Charging Network
9/4/20	Peridot Acquisition Corp	PDAC/U US Equity	$300	$14.15	2/16/21	Li-Cycle Corp.	Energy Storage
8/24/20	Tortoise Acquisition Corp II	SNPR/U US Equity	$345	$14.81	2/8/21	Volta Industries, Inc.	Electrical Vehicle Charging
7/29/20	Forum Merger III Corp	FIIIU US Equity	$250	$11.61	12/11/20	Electric Last Mile, Inc.	Electric Vehicles
7/27/20	Northern Genesis Acquisition C	NGA/U US Equity	$300	$22.82	11/30/20	Lion Electric Company	Electric Vehicles
2/25/20	GigCapital3 Inc	GIK/U US Equity	$200	$19.76	12/10/20	Lightning eMotors	Electrical Vehicles
11/25/19	CIIG Merger Corp	CIICU US Equity	$259	$14.90	11/18/20	Arrival	Electric Vehicles
5/28/19	Switchback Energy Acquisition	SBE/U US Equity	$314	$16.92	9/24/20	ChargePoint, Inc.	Electrical Vehicle Charging
2/13/19	Tuscan Holdings Corp	THCBU US Equity	$276	$41.49	2/1/21	Microvast	Energy Storage

Deal Stage	In Talks

SPAC Announced Date	SPAC Name	Ticker	Offer Size ($MM)	Last Price	Announced Date	Target Company	Area of Focus
10/6/20	RMG Acquisition Corp II	RMGBU US Equity	$345	$12.29	NA	ReNew Power Pvt. Ltd.	Renewable Energy
9/18/20	NextGen Acquisition Corp	NGACU US Equity	$375	$13.18	NA	Xos Trucks Inc	Electric Vehicles
9/11/20	Qell Acquisition Corp	QELLU US Equity	$350	$13.02	NA	Lilium	Electric Aviation
8/31/20	Reinvent Technology Partners	RTP/U US Equity	$690	$14.44	NA	Joby Aviation	Electric Aviation

Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse research
(1) Excludes transactions in which Credit Suisse is currently restricted

SPAC Deals[1] Focused on Broader ESG Themes

Deal Stage	Completed

SPAC Announced Date	SPAC Name	Ticker	Offer Size ($MM)	Last Price	Announced Date	Target Company	Area of Focus
4/28/20	AppHarvest Inc	APPH US Equity	$100	$33.31	9/29/20	AppHarvest Inc.	AgTech Company
3/2/20	Danimer Scientific Inc	DNMR US Equity	$200	$43.80	10/5/20	Danimer Scientific Inc	Bioplastic Materials
11/25/19	SOC Telemed Inc	TLMD US Equity	$250	$9.04	7/29/20	SOC Telemed Inc	Telehealth
6/28/19	Hims & Hers Health Inc	HIMS US Equity	$201	$17.32	10/1/20	Hims & Hers Health Inc	Telehealth
4/5/19	Whole Earth Brands Inc	FREE US Equity	$300	$13.76	12/17/20	Whole Earth Brands Inc	Healthy Food
2/25/19	Desktop Metal Inc	DM US Equity	$300	$23.20	8/26/20	Desktop Metal Inc	3D Printing
7/6/18	Tattooed Chef Inc	TTCF US Equity	$200	$21.54	6/12/20	Tattooed Chef Inc	Plant Based Food

Deal Stage	Definitve Agreement

SPAC Announced Date	SPAC Name	Ticker	Offer Size ($MM)	Last Price	Announced Date	Target Company	Area of Focus
10/23/20	TS Innovation Acquisitions Cor	TSIAU US Equity	$300	$15.88	1/25/21	Latch, Inc.	Smart Home/Smart Security
10/8/20	Forest Road Acquisition Corp	FRX/U US Equity	$300	$15.45	2/10/21	Beachbody	Digital Fitness and Nutrition
9/4/20	TPG Pace Tech Opportunities Co	PACE/U US Equity	$450	$11.30	1/29/21	Nerdy Inc	Online Learning Platform
9/3/20	Falcon Capital Acquisition Cor	FCACU US Equity	$345	$13.22	2/12/21	Sharecare	Health & Wellness
8/24/20	Sandbridge Acquisition Corp	SBG/U US Equity	$230	$10.64	2/16/21	Owlet Baby Care Inc.	Connected Nursery - Modern Parenting
8/14/20	CM Life Sciences Inc	CMLFU US Equity	$443	$23.23	2/10/21	Sema4	Genomic & Clinical Data Platform
8/7/20	CF Finance Acquisition Corp II	CFIIU US Equity	$500	$11.30	11/30/20	View, Inc.	Smart Glass/Smart Building Solutions
7/20/20	Gores Holdings V Inc	GRSVU US Equity	$525	$10.99	2/23/21	Ardagh Metal Packaging	Metal Packaging
5/1/20	Longview Acquisition Corp	LGVW/U US Equity	$404	$26.06	11/20/20	Butterfly Network, Inc.	Accessible Medical Imaging
5/9/19	GigCapital2 Inc	GIX/U US Equity	$173	$13.04	11/23/20	UpHealth, Inc.	Telehealth

Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse research
(1) Excludes transactions in which Credit Suisse is currently restricted

Companies Mentioned *(Price as of 24-Feb-2021)*

Acuity Brands (AYI.N, $126.36)
Eaton Corporation (ETN.N, $130.86)
Emerson Electric (EMR.N, $86.8)
IBP (IBP.N, $122.92)
Schneider Electric (SCHN.PA, €123.6)
Siemens (SIEGn.DE, €130.92)
Trane Technologies (TT.N, $153.2)

Disclosure Appendix

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Outperform (O) : The stock's total return is expected to outperform the relevant benchmark* over the next 12 months.

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