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The UBS Sustainability and Impact Institute

The green inflection point

Driving decarbonization of the real economy

Mike Ryan
Head of the UBS Sustainability
and Impact Institute

Dear Reader,

Over the past half century there has been a seismic shift in sentiment with regard to the environmental challenges threatening our planet. According to a recent Pew Research poll, 64% of those surveyed now say that protecting the environment should be one of the top priorities for elected leaders. It is instructive to note that prior to 1972, this sort of environmental polling and surveying didn't even exist.

As societal attitudes about these threats have changed, so too has the level of engagement by the financial community. Once content to own assets with little regard for the environmental consequences, many financial professionals now actively employ strategies intended to mitigate the negative impact. This ranges from portfolio strategies that exclude and divest companies that fail to incorporate responsible sustainability practices, to lending policies that limit or prohibit financing to industry sectors that contribute to environmental degradation.

While these have been necessary steps in raising awareness and altering behaviors, they are by no means sufficient to deal with the threats we now face.

The "greening" of portfolios may have allowed investors to align their investment holdings with their own values and preferences, but it has actually done little to decarbonize the real economy. The Global Carbon Project estimates that global emissions of carbon dioxide from fossil fuels have more than doubled from 16 billion metric tons when the United Nations Conference on the Human Environment was convened in 1972 to around 35 billion metric tons currently.

It is clear that much more now needs to be done.

Therefore, in this paper we explore how the financial sector can play a catalytic role in accelerating the decarbonization of the real economy. This entails mitigating risks and improving returns through three critical dimensions: financing; investing; advising. So, first we assess how banks can accelerate capital reallocation (for both transitioning existing businesses and scaling frontier innovation) toward a low-carbon economy through their financing decisions. Next, we examine the role that climate-conscious investors must play in encouraging corporations to adopt greener business practices instead of simply divesting pollutive assets. Lastly, we focus upon how advisors can accelerate these changes by creating innovative financial instruments, highlighting the financial value of sustainable investment options and helping to establish task forces that will drive the climate transition.

We acknowledge that the interdependencies between key actors (governments, corporations, financial institutions, consumers, small business) complicate the ability to scale solutions all along the way. This means that establishing effective collaborative frameworks is essential for driving real progress. We therefore chose to highlight three global corporations that are leading these transformations through their ability and willingness to create novel approaches to sustainability-related challenges.

It is our fervent hope that you will find this paper to be not only insightful…
but also inspiring.

Mike Ryan

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Introduction

Some of the key tools and approaches used by the financial sector to address climate change have historically focused on "not doing" certain things, whether they be limiting lending, removing portfolio exposures through exclusion, or divesting, to name just a few. While all these activities send a message, help create awareness and lead to acceptance, their real-world impact on decarbonization has limitations.

The same pollutive industries are still out there emitting, they are just more likely to be underrepresented in "green" investment portfolios or other financial activities. So, while investors' intentions may be noble, the actual impact of those climate actions falls short of matching that intent.

The current approaches to climate finance have helped to anchor sustainability and climate in the collective investor psyche. However, with the financial sector in the midst of implementing extensive net-zero commitments, we ask: what more can be done to drive real change? Are our efforts making enough of a difference? And where could the financial sector be more impactful?

To make more measurable impact possible, the financial sector has an opportunity to become more directly involved in driving change in key sectors of the real economy. But that is easier said than done. Corporate engagement has had and continues to have an important role to play in the transition to a low-carbon economy. To drive change further, financial institutions need to continue constructive engagement with emission-intensive sectors against a background of regulatory pressures and public scrutiny. Decarbonizing these sectors is necessary if we are to meet our climate goals. Solving the climate crisis represents an enormous commercial opportunity. The narrative is starting to change, and pragmatic approaches are gaining ground, but we still have a long way to go.

Scaling innovative green technology solutions quickly will assist in decarbonizing emission-intensive sectors. Many important solutions are on the frontier of technology development and deployment, which presents investors with both opportunities and challenges. While the financial sector is well positioned to empower change, facilitating large-scale investments in projects that are far from

economic viability can be problematic, which in turn has contributed to a funding gap. We are observing a catch-22 situation where someone needs to take the first step: progressive governments, forward-looking investors, or even philanthropists. Innovative financing models can then play a role in bridging the gap that remains.

In this paper we explore how the financial sector can help accelerate real-economy decarbonization, thereby mitigating risks and improving returns, by using three key tools in the vast financial toolbox:

1. financing
2. investing
3. advising

To drive the change, we argue there is an opportunity for financial institutions to rethink, reframe, reorganize and innovate. We also focus our attention on corporate actors who find themselves adapting their business models and approaches in order to reach their net-zero targets. How can the financial sector best support them in their transition?

The interdependency pyramid

From an environmental perspective, climate change is well understood. We know what must be done to mitigate the climate crisis and already have a whole host of viable solutions at hand. But implementing these solutions at scale is challenging.

The ability to effectively scale solutions at a sufficient pace is influenced by the interdependencies between actors (see Figure 1). We can think of this as a network pyramid with governments at the top setting the scene. Corporations, supported by financial-sector firms, are in the middle and are the key actors that are able to act with agency. At the bottom, consumers, small and medium-sized enterprises (SMEs) and investors create pressure through their expectations and demand. The climate crisis will not be solved with a top-down approach alone: it requires a mobilization at the grassroots level as well. The Fridays for Future[1] movement is one example of effective bottom-up pressure from the consumer level. SMEs will drive demand and create a market for green products. Investors are opportunity seeking and will shape expectations from the bottom up. To be effective, the whole pyramid should ideally move in tandem toward the same goal of effecting real change.

To add to the complexity, these actors are located across different countries each with their own unique situations and interests in mind. Broad multinational agreements around commitments can help, but practical steps toward financing at scale are still lagging behind. This is especially noticeable when you consider funding frontier technologies. To enable first movers and changemakers to act, the hybrid financing models discussed later in this paper could prove useful.

[1] https://fridaysforfuture.org/

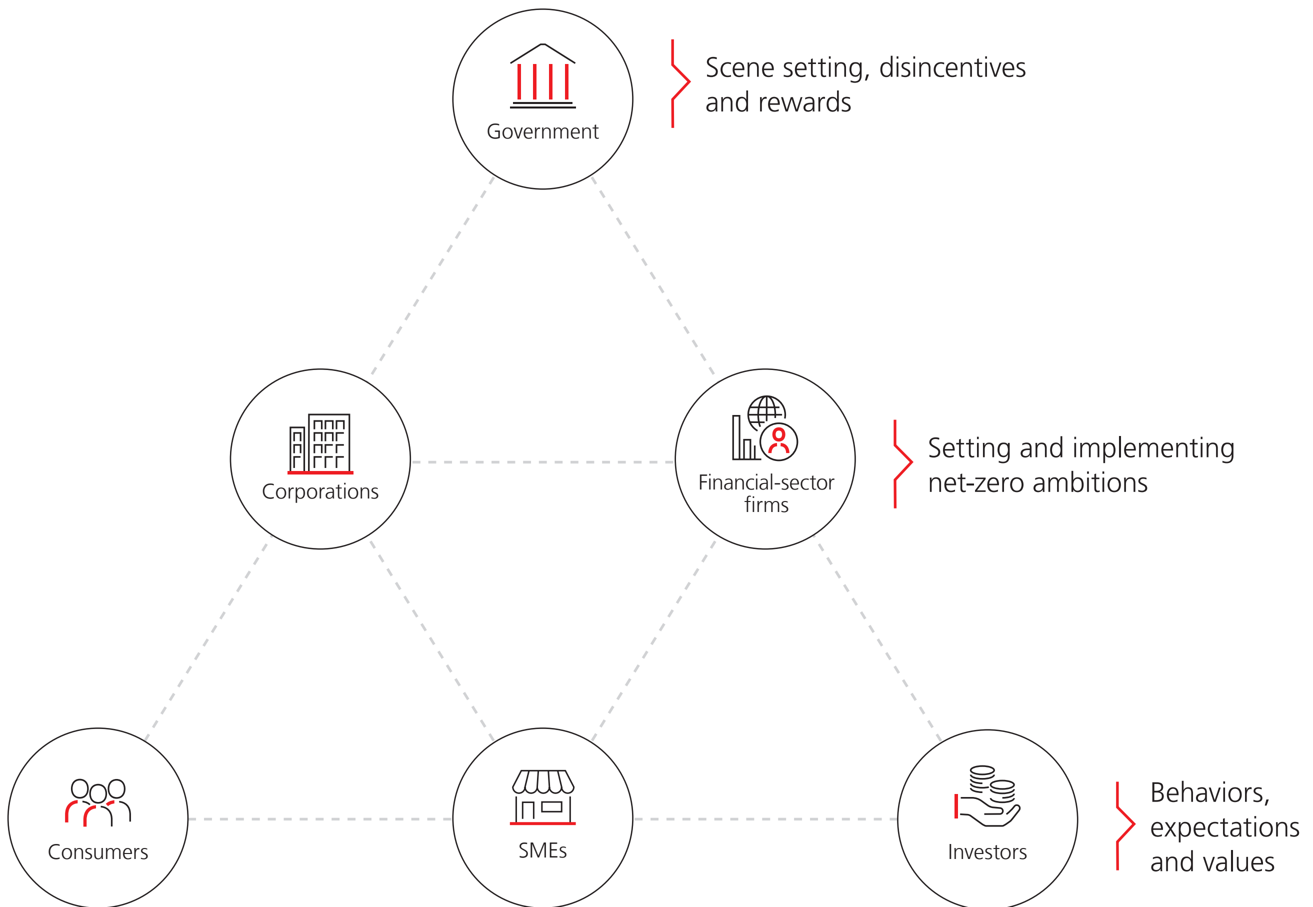


Figure 1: The interdependency pyramid. Source: UBS.

What complicates this even further is the fact that complex frictions and inefficiencies exist within organizations too. For instance, the regulatory environment governing information barriers within full-service financial institutions can mean that individual divisions do not always have full sight of similar initiatives across their organizations.

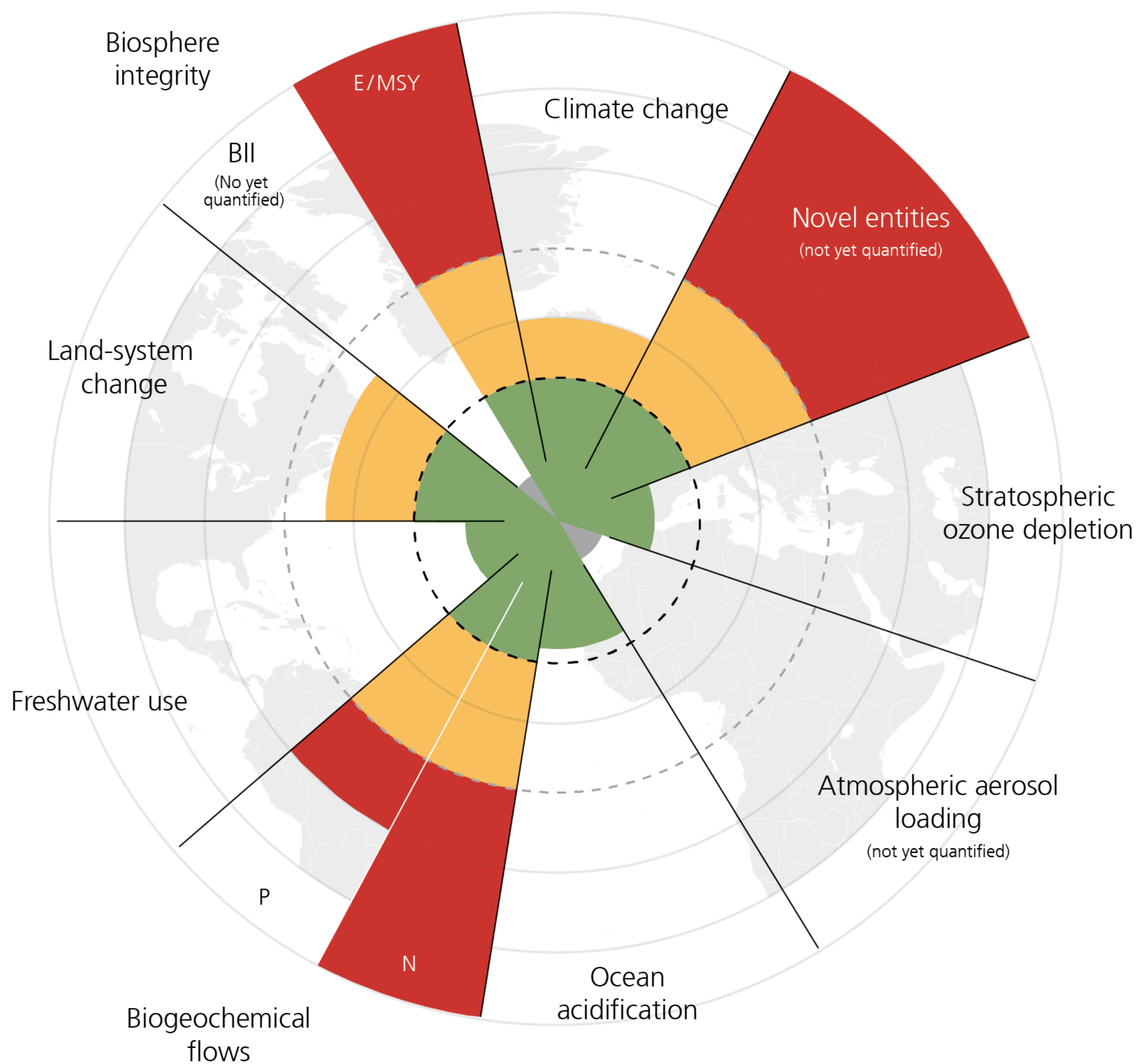
Nonetheless, despite such strict operational rules, cross-divisional collaboration is still possible. And since climate change requires such a broad set of solutions for clients, we believe such collaborations and frameworks are essential for enabling and driving this progress.

Systems thinking

In our view, systems thinking underpins any framework related to climate change. This approach allows us to see the big picture and understand a financial institution's role. Importantly, it can be used to identify the most impactful actions.

A system is a synergy of individual components, where the whole is greater than the sum of its parts. As we discussed in the UBS Sustainability and Impact Institute's publication "From Ozone to Oxygen," climate change and biodiversity loss are essentially "system of systems" failures. One way to break the chain of negative impacts is to deploy systems thinking to find solutions. By identifying key challenges and understanding their root causes, we can begin to understand how the system works.

Capital allocators could use scientific research and frameworks to single out key issues and build understanding. The planetary boundaries framework (see Figure 2), for instance, highlights the key elements of biosphere resilience and focuses on the degree of risk behind each component. This creates a clearer picture of dependencies and causation.



BII	Biodiversity Intactness Index
E/MSY	Extinction rate (Extinctions per million species/years)

- Below boundary (safe)
- In zone of uncertainty (increasing risk)
- In zone of uncertainty (increasing risk)

Figure 2: Nine planetary boundaries as a measure of biosphere resilience (January 2022 Update). Source: L. Persson, Carney Almroth, C.D. Collins, S. Cornell, C. de Wit et al 2022. "Outside the Safe Operating Space of the Planetary Boundary for Novel Entities," Environmental Science & Technology.

To better understand the issues they seek to influence, investors are steadily working on mapping out the system and developing theories of change. Developing a theory of change can help outline causal linkages and logic models can be used to create further structure (see Figure 3). These frameworks help with milestone setting, benchmarking, monitoring and accountability. We hope this paper contributes to this effort in the area of real-economy decarbonization.

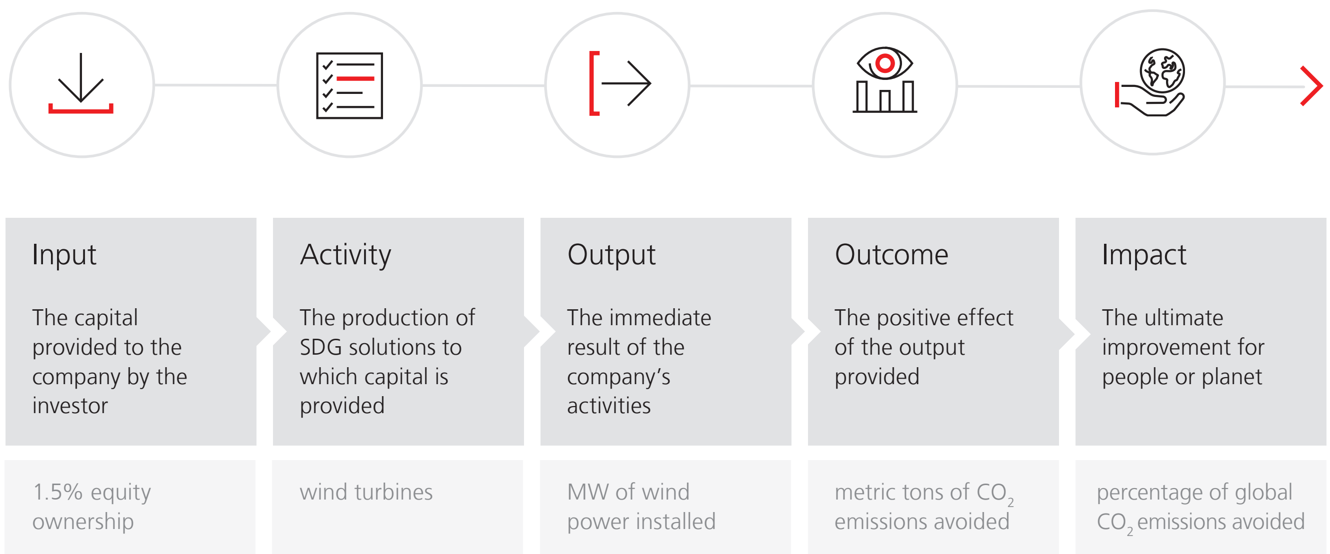


Figure 3: A simplified example of an investment logic model for wind power generation. Source: UBS.

Next, it is helpful to identify how to drive the required change most efficiently. Financial institutions have many levers available, including engagement, financing, investing, philanthropic activities, education and advice. Often, a combination of these levers will be the most effective, which is why collaboration across internal silos and organizational barriers is essential.

Haryanto Tjiptodihardjo

President Director,
PT Impack Pratama Industri, Indonesia

Tell us about your sustainability journey so far.
Our journey started in 2017, when a long-standing partner of ours approached us to ask if we wanted to create the solar-drying-dome product together. They were looking for partners to roll out the product in Asia, especially in Indonesia. We considered the idea as a business opportunity and not a CSR exercise. We did not need much time to consider and joined the venture within a week!

We rolled out the solar-drying-dome product and sold it to farmers. I have seen how the solar dome has truly helped them improve their lives. There are so many real stories that I hear and I am always so inspired to see how our products are helping underserved communities increase their incomes and be more effective in their work. It is such a joy to experience the change in real terms.

We want to give back socially as well. We make plastic, which is public enemy No. 1 globally, but since we are part of the problem, we need to be more responsible regarding our environmental and social footprint.

We include recycled plastics, both PET and plastic bags, in our roofing panels. We are considering further business acquisitions upstream to the manufacturers of our component parts, which will give us much more scale potential.

Why do you feel the need to go upstream? This will increase your GHGs.
We want to shorten the path PET takes from disposal to integration into products. The circularity of PET, in particular due to health and food concerns, is not very easy. PET bottles cannot be made with a high percentage of recycled PET. This is a devil's circle with a very short life span.

When we use recycled PET, we remove it from the market and put it into our products to give it a further usage life of 5–10 years. This gives us time to figure out how to deal with the end disposal and time to find the technology to help find a more permanent solution.

We want to figure out how to use the lowest quality single-use plastics as well and how we can mix them into concrete or paving stones. If we can find ways to incorporate that into building materials, it both reduces weight and removes the plastics from the waste cycle for 30–40 years.

> "...we feel a responsibility to educate consumers and work toward a greener future. We are creating our own pressure. We believe and hope that if we do this correctly, the future will be better. We can do well by doing good."

Do you also consider the emissions saved by the process?
Yes, we are looking at our emissions. We do use solar panels to help power our factories. We are working toward reducing our emissions, and while not yet at net zero, we are on the path there.

Where does your passion and drive come from?
Our government does not particularly focus on this space. They don't have subsidies for this and don't have real actions in place. Our customers don't particularly focus on sustainability either.

But we feel a responsibility to educate consumers and work toward a greener future. We are creating our own pressure. We believe and hope that if we do this correctly, the future will be better. We can do well by doing good.

As a listed company, we have duty towards our shareholders, but if we can also do good, we will prove that our revenues and profits will grow with our focus on greening the work we do. We can lead the way and be an example to the market in Indonesia. I hope that in the next five years that we will have many other companies greening their businesses. Someone must start! If not now, when?

A key issue we face is still lack of talent. To help with that, we are building an institute in Indonesia to help increase our reach and impact. This school will provide opportunities for high-school graduates to become better educated in the recycled products space. We will educate an army of doers with the same greening philosophy we have. And we want them to spread the message as they go out to work across the country.

What can the financial sector do better to help accelerate your work?
At the moment, the roadblocks to growth are largely related to a lack of education and awareness, from our perspective. It could be useful for the financial sector to help create awareness about companies making products like ours, to help us find potential partners and create the marketplaces, to help scale production to be more impactful and reach global markets, and to help us develop a green supply chain.

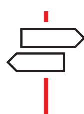
Solar drying dome, Indonesia
Used to dry agricultural and farm products by using the power of the sun to create heat.

Motivations behind climate finance

Access to financing represents both a critical driver and a daunting challenge for achieving necessary progress on the climate front. Understanding the motivations that drive financial institutions to integrate climate considerations across their activities will help bring clarity, ensure alignment, and shine a light on impact.

Climate change represents an enormous commercial opportunity. Applying a climate lens, we can consider possible investor motivations, which fall broadly into at least one of these categories:

Financial Returns
drivers of financial risks and rewards



Ethical Preferences
exposure aligned with moral values

Impact
leverage investments to make a difference

All three of these motivations are valid, but often misunderstood. Climate considerations can either be incorporated as inputs for ethical and financial reasons or treated as an output for impact. The two approaches are vastly different, lead to different investment decisions and require different investor mindsets and processes.

Strategies labelled "climate," "green" or "sustainable" tend to focus on a lower portfolio carbon footprint. In practice, this means that pollutive companies are underrepresented in the portfolio. Some investment strategies go further by overweighting solution providers – companies that actively contribute toward solving the climate crisis. Both strategies can support investors who want to reduce their exposure to pollutive companies and embrace solutions. From a financial perspective, emissions represent risk and the solutions bring opportunities. The question is, to what degree do these strategies actually drive impact?

Sending a signal, whether is it positive or negative, can encourage change. Furthermore, large-scale collective divestments could in theory increase a company's cost of capital. However, to our knowledge there is no evidence of investments or divestments in secondary markets that lead to impact in the real economy. With that in mind, what more can be done to address the climate crisis in a meaningful way?

What is investor impact?

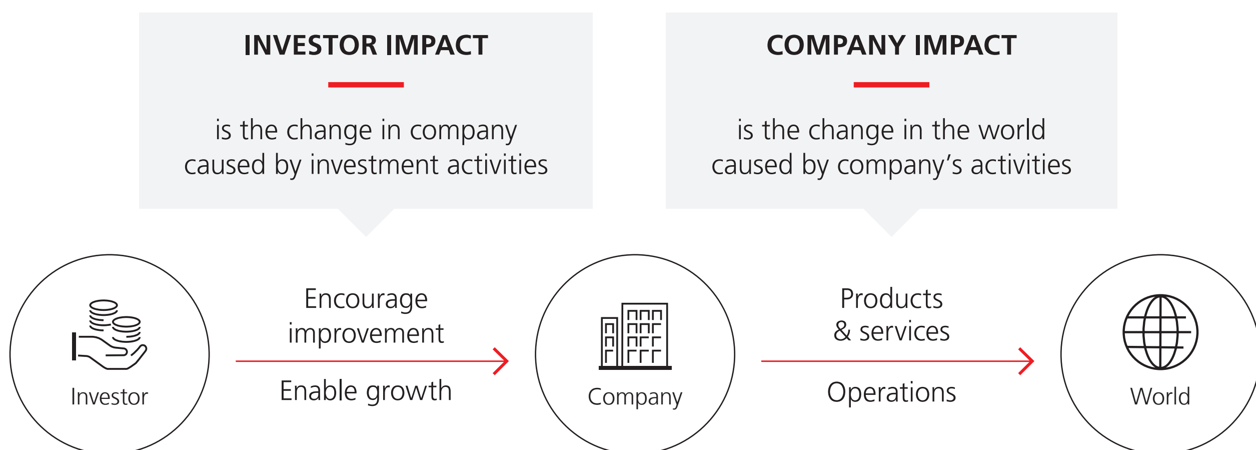


Figure 4: What is investor impact?
Source: The Investor's Guide to Impact, University of Zurich, Florian Heeb, Julian Kölbel, 2021.

Investor impact requires *additionality,* as we discussed in the UBS Sustainability and Impact Institute's whitepaper "Define. Align. Refine." Investor impact requires investors' activities to drive a change in the real-world effects of a company's activities, a change that is unlikely to have occurred without the investors' involvement (see Figure 4). This is a high hurdle and a resource-intensive endeavour.

A key impact lever when it comes to investments in large and/or publicly listed companies is company engagement. Effective investor engagement should be aligned with an investment thesis and be evidence-based and constructive in nature. The growth in recent years of large-scale investor collaborations, such as Climate Action 100+[2], has provided some clear examples of engagement success.

Another clear example of engagement can be seen in recent collaborations that involve both private and public-sector stakeholders. The Net-Zero Banking Alliance, the Net Zero Asset Management Initiative and the Glasgow Financial Alliance for Net Zero showcase the financial sector's active role in driving efforts that provide leadership and guidance on meeting net zero goals.

2 https://www.climateaction100.org/net-zero-company-benchmark/methodology/

Another lever is to provide primary capital where there are clear gaps, i.e., where the rest of the financial system is unwilling to invest. Here there are two main areas of funding needed:

1. transition financing, where proceeds are earmarked for decarbonization of legacy businesses; and
2. scaling solutions – often by supporting early-stage private companies whose technologies effectively enable decarbonization.

Financial institutions' investing and financing functions both play a role in addressing these gaps.

Without *impactful engagement* or *targeted solution funding,* financial activities fall short of the additionality criteria. There is neither a morally right nor a morally wrong approach to climate finance, only a lack of clarity or an unwillingness to commit.

Focus on change

Today, the notion of sustainable investing and financing is well established. Socially responsible investing as we now know it dates back to the 1960s. However, it has only recently become mainstream, and many concepts are still nascent. Standards and industry praxis will continue to evolve rapidly. This section discusses a fundamental shift in how emissions are perceived and treated.

With the current focus on low portfolio carbon footprints, gaining meaningful investment exposure to and therefore engagement with emission-intensive sectors is challenging. The same is true across financing activities where stringent measures on funded emissions apply. Still, sectors with high emissions, such as materials, agriculture and energy, are vital to our society.

Invest for Greenness or Greening

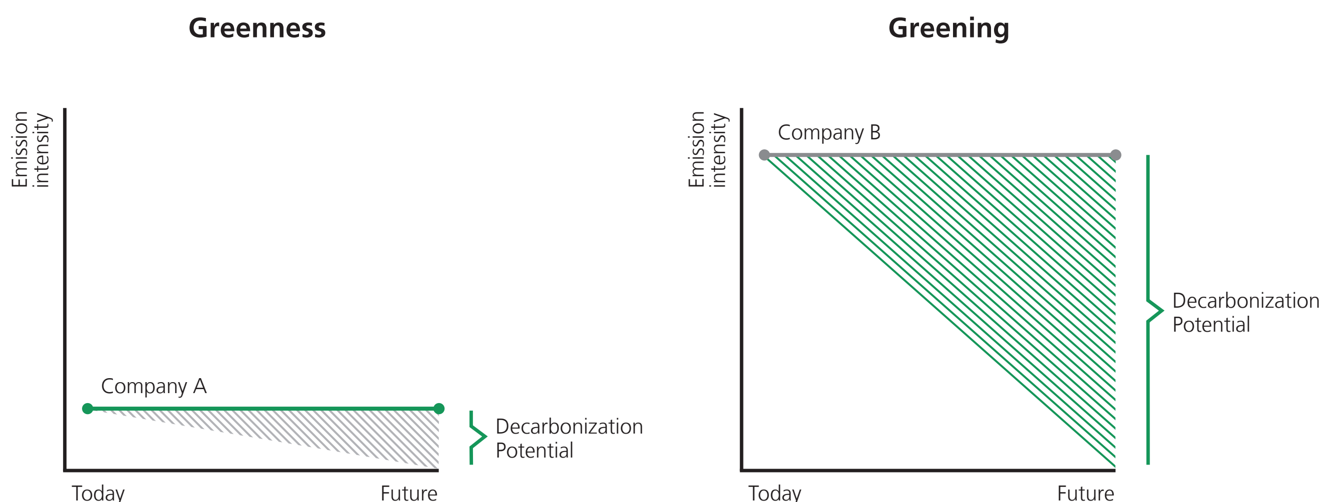


Figure 5: Stylized illustration of the difference between investing in a low emission-intensity company with limited decarbonization potential (Company A) and a high emission-intensity company with ample decarbonization potential (Company B). With a low carbon portfolio footprint focus investors are incentivized to invest in Company A. With a rate of change focus investors are incentivized to invest in Company B. Source: The UBS Sustainability and Impact Institute, 2022.

The investor-led initiative Climate Action 100+ promotes forward-looking and change-focused company disclosures. Likewise, financial institutions could move away from only considering historical levels of emissions, toward focusing on the potential future rate of change (see Figure 5). This promotes a fundamentally different approach to both climate investing and financing:

- Treating improvement potential as an opportunity will enable financial institutions to engage with emission-intensive sectors where decarbonization efforts matter the most.
- Future change, as a metric, is better aligned with an impact mindset, encouraging innovation and real-world change.

We know that what gets measured gets managed. Working with stakeholders across the industry to produce better-aligned metrics will help shift the focus toward driving real change.

Financing: using capital to scale solutions

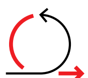
As banks strengthen lending policies for high-polluting sectors, this is often coupled with an exclusionary approach. However, these strategies do not address decarbonization of the real economy directly, but instead shift responsibility to others. Financing efforts that focus on driving change rather than deferring action or shifting burdens can help to scale solutions more quickly.

Banks can play a vital role in supporting emission-intensive companies to transform their business models. At the same time, banks face climate-related regulations and scrutiny from stakeholders, similar to that of their corporate clients. This enables banks to apply their own experience and understanding of the dynamics of value drivers, stakeholder preferences and evolving regulations to assist clients with their own transitions.

We see three pivotal areas for banks to address.

Provide information: ensure relevant sustainability-related information is available to financial market decision-makers.

Promote action: feed such information into business decisions.



Facilitate shift: help direct financial flows towards a net-zero and nature-positive economy.

It is not uncommon in the marketplace for misperceptions to persist regarding technologies, sectors or regions. Banks have an opportunity to lead in knowledge facilitation and capacity building to help clear up misperceptions. This can take place through partnerships between stakeholder groups to generate a common framework and create a supporting infrastructure. Green or sustainability labelled instruments are excellent examples of how the market has created a structure for companies to communicate, commit, comply and disclose on climate-related obligations. By using these instruments banks can reflect their transition approaches and active engagement to the capital market and investors.

We note that new green technologies are frequently not accounted for within banks' existing risk valuation frameworks, which often focus on proven technologies as a criterion for balance sheet lending. This means that to accelerate capital reallocation toward a low-carbon economy it is vital to reassess how we understand risk in a context that is often unknown and to readjust the frameworks accordingly.

At the same time, there is scope for banks to explore risk-reducing structures through public–private partnerships, such as first-loss capital arrangements, known as blended finance.

"Blended finance describes a model for financing development projects that combines an initial investment, often from a philanthropic or government entity, with a subsequent commercial investment."

Source: Impactivate, ESG Investing – What is Blended Finance?, 5 September 2019. Accessed on 31 August 2022 via https://www.theimpactivate.com/what-is-blended-finance/

Blended finance in action – outcomes-based approaches
UBS, in partnership with UBS Optimus Foundation, has launched vehicles designed to deploy socially motivated investments targeting social and environmental impact. Governments often provide upfront funding for projects with future outcomes or that benefit diverse stakeholders. In blended finance approaches private capital takes the upfront risk – either through philanthropic funds or impact investing – and government funding is only provided if/when agreed outcomes are achieved. This approach helps to de-risk social and environmental projects and preserve government funding for approaches that are effective and scalable.

Activity-based funding	Outcome-based funding
A donor designs **a detailed 'specification'** for the service activities	Donor describes the **outcomes** it wishes to achieve from the service
Delivery organisations compete to bid on **who can meet the specication most closely**	Delivery organisations **compete on achieving the most outcomes,** at the best price per outcome
Delivery audits focus on ensuring that **nothing has changed from the original specification (regardless of whether it is working or not)**	Partnership meetings to undorstand what is working, what must be improved and how to achieve most outcomes for best total cost
Donor **pays** for the activities delivered, **irrespective of the outcomes actually achieved**	Donor **pays** for all of the **outcomes that are successfully achieved**
Process **rewards 'box-ticking'** and standardization, but prevents innovation and incremental improvements	Process **rewards all innovations** that achieve better outcomes and better value for money

Source: UBS Optimus Foundation.

Another option is to look at seed capital to aid tech start-ups. Moreover, there are opportunities to support larger corporate customers through off-balance financing options, such as special purpose vehicle (SPV) structures, also known as limited partnerships, and/or via the support of state guarantees. These structures could be set up to test and implement innovative technologies and help indicate the future direction of the parent company. Lastly, philanthropic activities can also help scale solutions to key implementation challenges, notably

1. risk transfer
2. mitigation of time to economic viability gap

New policies, such as the EU's Sustainable Finance Disclosure Regulation (the SFDR) and Taxonomy Regulation, do help to create more clarity and guidance regarding what sustainability is and is not. But, at the same time, they can have counterproductive implications. Banks that want to be perceived as "greener" may restrict or limit their actions due to an underlying fear of being labelled a "greenwasher" or even of potential litigations. Financial sector actors may not fully understand the very frameworks created to help them act more sustainably, and may indeed fail to act at all.

To speed up action on climate finance, efforts toward creating a common understanding among financial institutions are vital, so as to ensure banks can apply a transition finance lens to bank lending and finance facilitation. This will ensure that banks and stakeholders understand the constructive role they can play and avoid inactivity. The Paris Agreement Capital Transition Assessment (PACTA) provides a methodology for banks to assess their corporate lending portfolios by sector and technology. The Transition Plan Taskforce (the TPT) in the UK is another good example of an initiative seeking to create common ground and bring together multiple existing frameworks under one structure.

Patrick Ho

Deputy Head, Sustainable Development,
Swire Properties, Hong Kong

Tell us about Swire Properties' sustainability journey.
Swire Properties has long been a pioneer in sustainable development and we have adopted a comprehensive approach for identifying opportunities to incorporate sustainability into every facet of our business. As a real estate developer, this means that sustainability considerations are incorporated into the entire building cycle – from design, construction and operations right through to demolition. We believe that companies with better sustainability performance are more resilient to withstand systemic climatic, social and economic stresses and volatility.

Our current carbon strategy dates to 2016, when our Chief Executive announced our Sustainable Development Vision, which is "to be the leading sustainable development performer in our industry globally by 2030."

"For Swire Properties, it is about our desire to improve our performance and have a positive im-pact on society. We focused on climate because we want to lead, be innovative and drive ideas and approaches in the industry."

Decarbonization is one of the key areas of focus, particularly in view of the growing urgency related to climate change. To this end, we have been implementing various measures across our developments to drive carbon reduction.

In 2016, we set targets for 2020 to reduce the carbon intensity of our Hong Kong and Chinese mainland portfolios by 27% and 21%, respectively, against the baseline levels. We're delighted to say that we exceeded those targets, achieving reductions of 44.1% and 42.2%, respectively, by 2020.

We are the first real estate developer in Hong Kong and the Chinese mainland to have its 1.5°C-aligned science-based targets (SBTs) approved by the Science Based Targets initiative (SBTi). The SBTs ensure that our decarbonization pathway is aligned with the goals of the Paris Agreement in a meaningful and measurable way.

Innovation is crucial in helping us to achieve this goal. Renewable energy is one of the key areas where we are innovating, and we have made significant progress in both Hong Kong and the Chinese mainland.

For Swire Properties, it is about our desire to improve our performance and have a positive im-pact on society. We focused on climate because we want to lead, be innovative and drive ideas and approaches in the industry.

In the early 2000s, we were already working on energy efficiency issues. We started by focusing on reducing the impact from our buildings, which leads to real bottom line savings. Our company understands the transition risks to the industry. We want to keep our license to operate and engage with our investors and the ESG community. It is important to us that green financing becomes more available and understood.

In July 2021, our Taikoo Hui Guangzhou development became powered by 100% renewable electricity, generated via off-site wind power and purchased from a third party. This is our second project in the Chinese mainland to successfully secure 100% renewable electricity.

Taikoo Place, Hong Kong
Human-centric masterplan aims to cultivate a sustainable and healthy mixed-use community.

“Green financing is our preferred financing strategy that supports our transition to a low-carbon, sustainable business.”

We have applied the same innovative spirit in Hong Kong, installing a bio-diesel tri-generation and adsorption chiller system at One Taikoo Place – the first of its kind in a Grade-A office tower in the city. The system produces on-site renewable energy from biodiesel (converted from waste cooking oil collected from tenants) to supply combined heating, cooling and power generation. The output constitutes around 3.8% of One Taikoo Place’s total energy use.

We also work with universities and technology companies to research and develop a wide range of smart green-building technologies. For example, we collaborated with the National University of Singapore and Hong Kong Polytechnic University to develop a dual-level roof, combining a green roof with a solar photovoltaic system, for One Taikoo Place. Through our long-term partnership with Tsinghua University on the Chinese mainland we have developed artificial intelligence technology and other initiatives to improve the energy and sustainability performance of our global portfolio.

Green financing is our preferred financing strategy that supports our transition to a low-carbon, sustainable business. Our aim is to have 50% of our bond and loan facilities supported by green finance by 2025. As of the end of May 2022, we have reached 40%.

We are proud to be recognized globally for our efforts, for example we have been listed on the Dow Jones Sustainability World Index, the only Hong Kong company, since 2017, we are currently ranked first in Asia and seventh globally among the real estate peers, and we have reached the top of the Hang Seng Corporate Sustainability Index for the fifth consecutive year.

How do you measure embodied carbon and how do you factor it into your decision-making processes?

Within our set of SBTs, we have established a specific Scope 3 emissions reduction target to reduce the embodied carbon emissions of our new development projects by 25% per m^2 by 2030 (compared to the 2016–2018 baseline).

The embodied carbon emissions cover the total emissions from resource extraction, building material manufacturing, transportation, on-site construction works, waste disposal and sewage discharge/ treatment (i.e. cradle-to-site carbon footprint measurement).

In 2018, we initiated a comprehensive cradle-to-site carbon footprint pilot study for One Taikoo Place. The study was completed in 2019 with technical support from a research team from the Hong Kong University of Science and Technology’s Department of Civil and Environmental Engineering. We found that the embodied carbon in the building’s concrete, rebar and structural steel contributes to nearly 90% of One Taikoo Place’s total carbon emissions.

Applying the learnings, we have established performance-based targets on embodied carbon for concrete, rebar and structural steel for future projects

One Taikoo Place, Hong Kong
An award-winning triple Platinum grade certified (LEED, BEAM Plus and WELL) green and healthy building.

in Hong Kong. For Two Taikoo Place, our triple Grade-A office building development set for completion in 2022, we've been able to procure 100% low-carbon concrete which is certified at "Platinum" level by the Construction Industry Council (CIC) and a certain amount of the rebar is produced through an electric arc furnace process. This production method has a smaller carbon footprint.

We also include low-carbon procurement specifications for building materials used in new developments in our contracts with main contractors. These have become standardized requirements for our future developments in Hong Kong, which is a big step forward in our sustainable development journey.

As you seek to increase the share of green materials that you can use in your projects, is price an issue or does it come down to supply?
At Swire Properties, we don't only look at pricing. To meet our SBTs, we consider factors in addition to pricing. In the concrete sector, we don't see such a big difference in the pricing between low-carbon cement and traditionally-produced cement, due to better market availability of low-carbon options in Hong Kong. The numbers of suppliers offering low-carbon cement are increasing year after year.

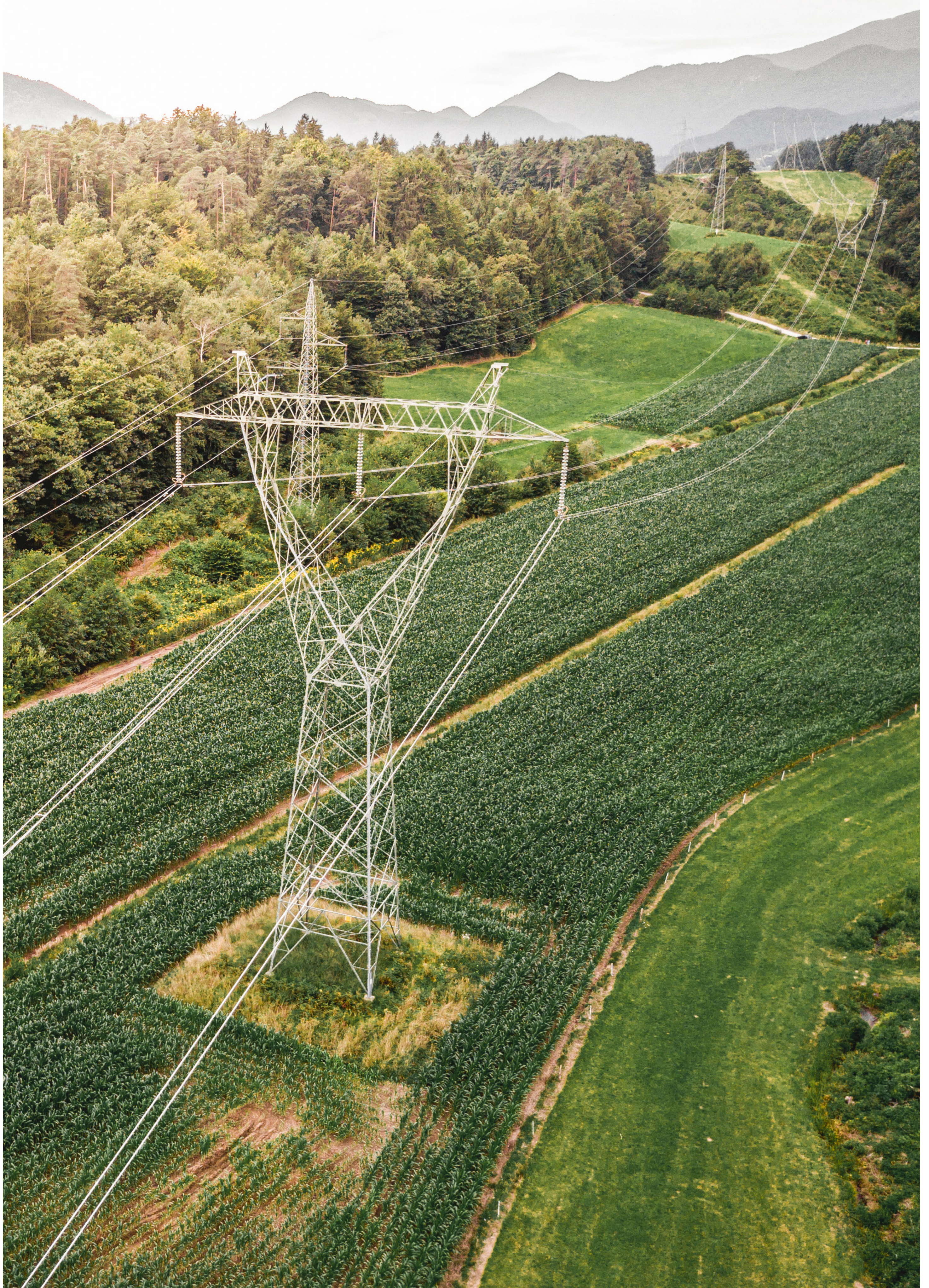
For low-carbon steel, the pricing is more complicated. Often we need to source from outside the region. China is tightening its low carbon requirement for the steel sector, which will help to increase the supply of low-carbon steel in the Chinese mainland market. Nonetheless, we need to advance this topic, which would involve more communication and collaboration with supply chain partners.

Our aim is to be impactful and to affect change in the industry. For that, we need three things:

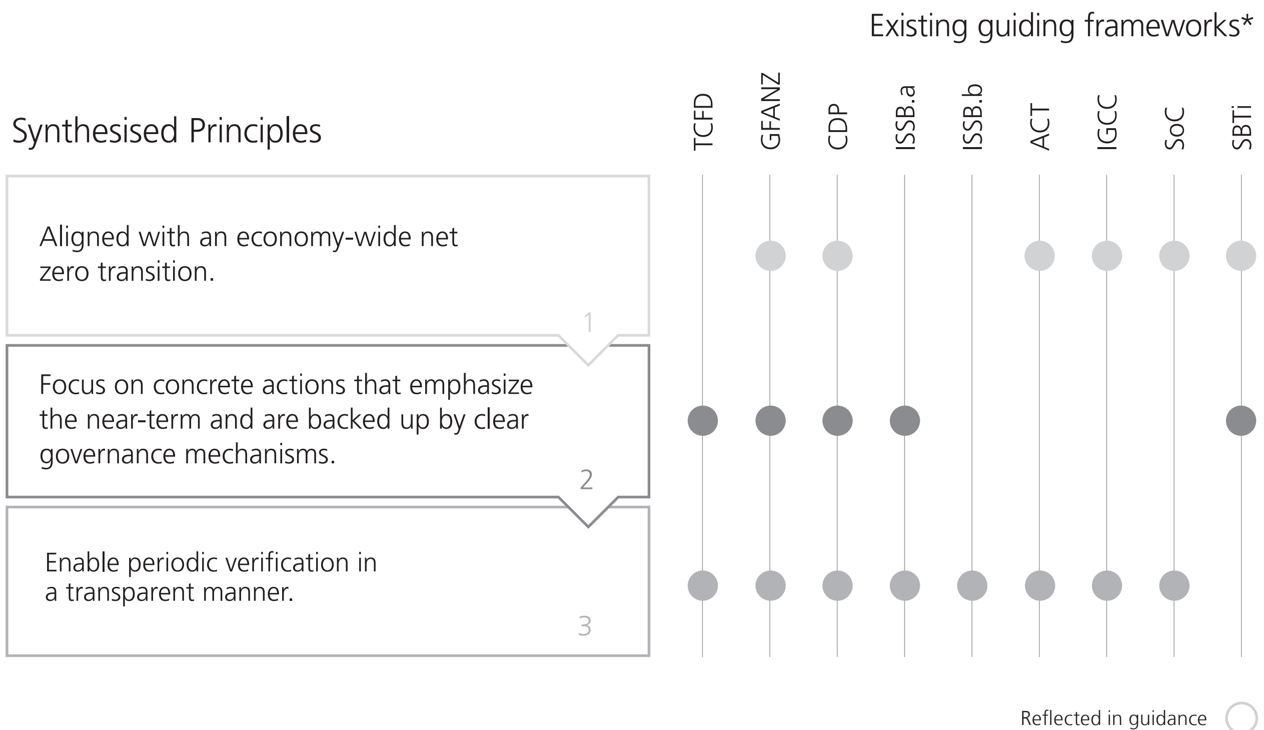
1. low-carbon products and materials at scale;
2. verification of embodied carbon data of the products we use, to ensure we can trust the data; and
3. close-proximity production, because this impacts scope 3 emissions.

How could the financial sector support the acceleration of decarbonization? What's missing?
New low-carbon technologies need more easily accessible funding. The products must be available at scale. Finance could make markets work better by bringing the demand and supply side together. Financiers need to understand the places where the sector can transition quickly and develop products that incentivize low- or zero-carbon projects and circular business models. Ideally, the financiers could set targets themselves for the Scope 1–2 emissions of the companies they fund. This lets the financiers drive change and have impact.

Another lever banks could have would be requiring their investees to consider embodied carbon and link this to the financial terms. We have not seen this happen yet, but it is one way to push the topic of embodied carbon up the agenda more quickly.



Alignment of Transition Plan Taskforce Principles with existing guiding frameworks
A transition framework aimed at financials will allow banks to support high-polluting sectors with their transitions (see Figure 6). The Task Force on Climate-Related Financial Disclosures (the TCFD) framework demonstrates how transition and physical risks can enter the financial system and it has become the preferred framework for climate-related financial disclosures across jurisdictions. Banks could give closer consideration to the opportunities that arise from the systemic threat posed by climate stress.



* TCFD, GFANZ1, CDP, ISSB.a (climate), ISSB.b (sustainability), ACT, IGCC, SoC (Say on Climate), SBTi.

Figure 6: Source: A Sector-Neutral Framework for private sector transition plans, Transition Plan Taskforce, 2022

Investing: leveraging ownership to drive change

Climate change dominates sustainable investing for a good reason: the climate crisis is the most urgent threat of our time and requires multiple levels of engagement and action across sectors.

For some companies minor adjustments to operating models and indirect actions will suffice in order for them to achieve their decarbonization goals. But others will need to reinvent their businesses completely. And some will make solving the climate crisis their primary business focus.

Two broadly recognized climate risks are *physical risks* to tangible assets and *transition risks* related to transitioning to the low-carbon economy. These risks are double-edged swords and represent both challenges and enormous commercial opportunities. Investment managers cannot ignore climate considerations, regardless of institutional norms, mandates or investment strategy. Investments are a bet on the future profitability of a business, operating in a future inexorably shaped by climate change. Climate considerations are financially material.

Is it enough to incorporate climate considerations into the investment process or should investments actively contribute toward solving the climate crisis? This can open a constructive discussion about the various interpretations of what fiduciary duty includes, some of which suggest going beyond producing returns and mitigating risk. Certainly, asset managers should understand what their market climate strategies can or cannot potentially achieve and communicate that clearly.

We believe there is an opportunity for investors to have a measurable impact and play a more meaningful role in tackling climate change. We suggest that greater clarity and broader understanding around investment product objectives will drive capital toward impact offerings. As previously discussed, focusing on change and decarbonization potential can further

support this move. In this section, we will focus on a similar metric change to an investment portfolio's carbon reductions. Government incentives and philanthropic capital will only stretch so far. Broader market-based solutions can attract larger pools of private capital to help reach scale.

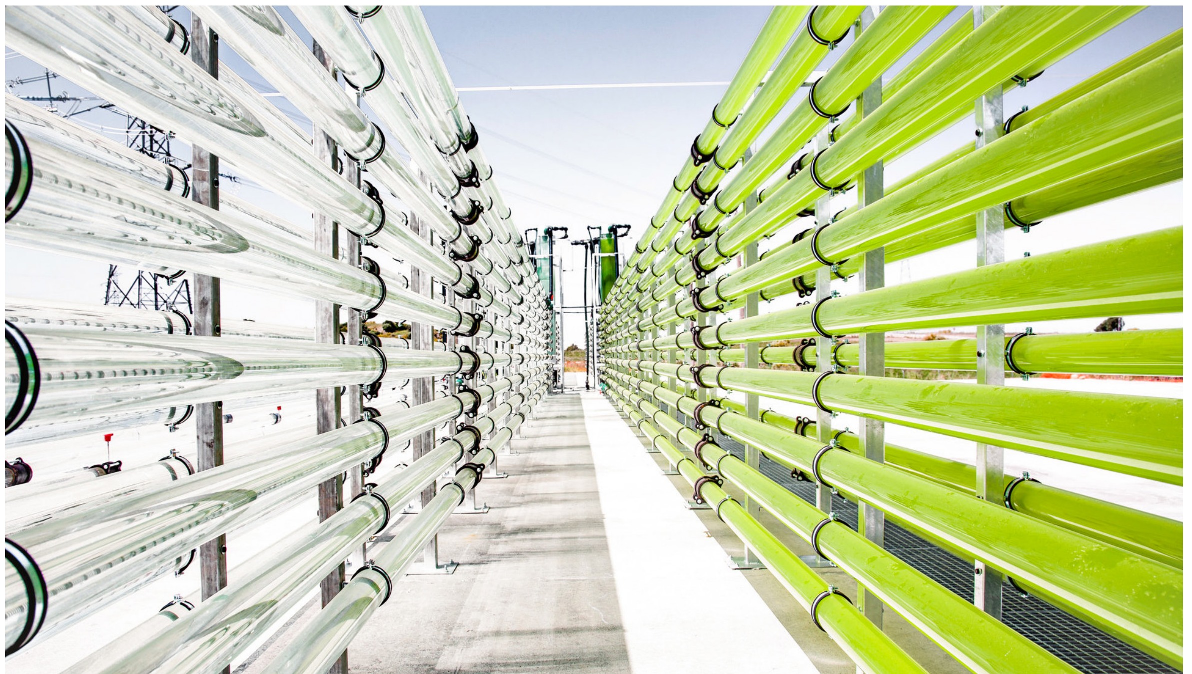
The GHG Protocol establishes comprehensive global standardized frameworks to measure and manage greenhouse gas (GHG) emissions from private and public-sector operations, value chains and mitigation actions. The GHG Protocol works with governments, industry associations, NGOs, businesses and other organizations.

Source: https://ghgprotocol.org/about-us

Key action: redefine how we report portfolio carbon reductions

In agency theory company executives are referred to as agents acting in the best interests of principals, the shareholders (investors) (see Figure 7). Climate-conscious investors often advocate that companies do not divest pollutive assets, but instead stay in control and take decisions that lead to greener business practices. However, if companies divest assets with material levels of emissions, the GHG Protocol[3] recommends that companies go back and recalculate historical base-year emissions by excluding the divested asset. This means that the company will not lay claim to having achieved any decarbonization. This practice precludes the disposal of unwanted assets being championed as progress. But do investors live up to the same standard?

[3] Base year recalculation methodologies for structural changes, GHG Protocol, 2005



Tubular bioreactors filled with green algae fixing CO_2. Arcos de la Frontera, Cadiz, Costa de la Luz.

To divest, or not to divest, that is the question.

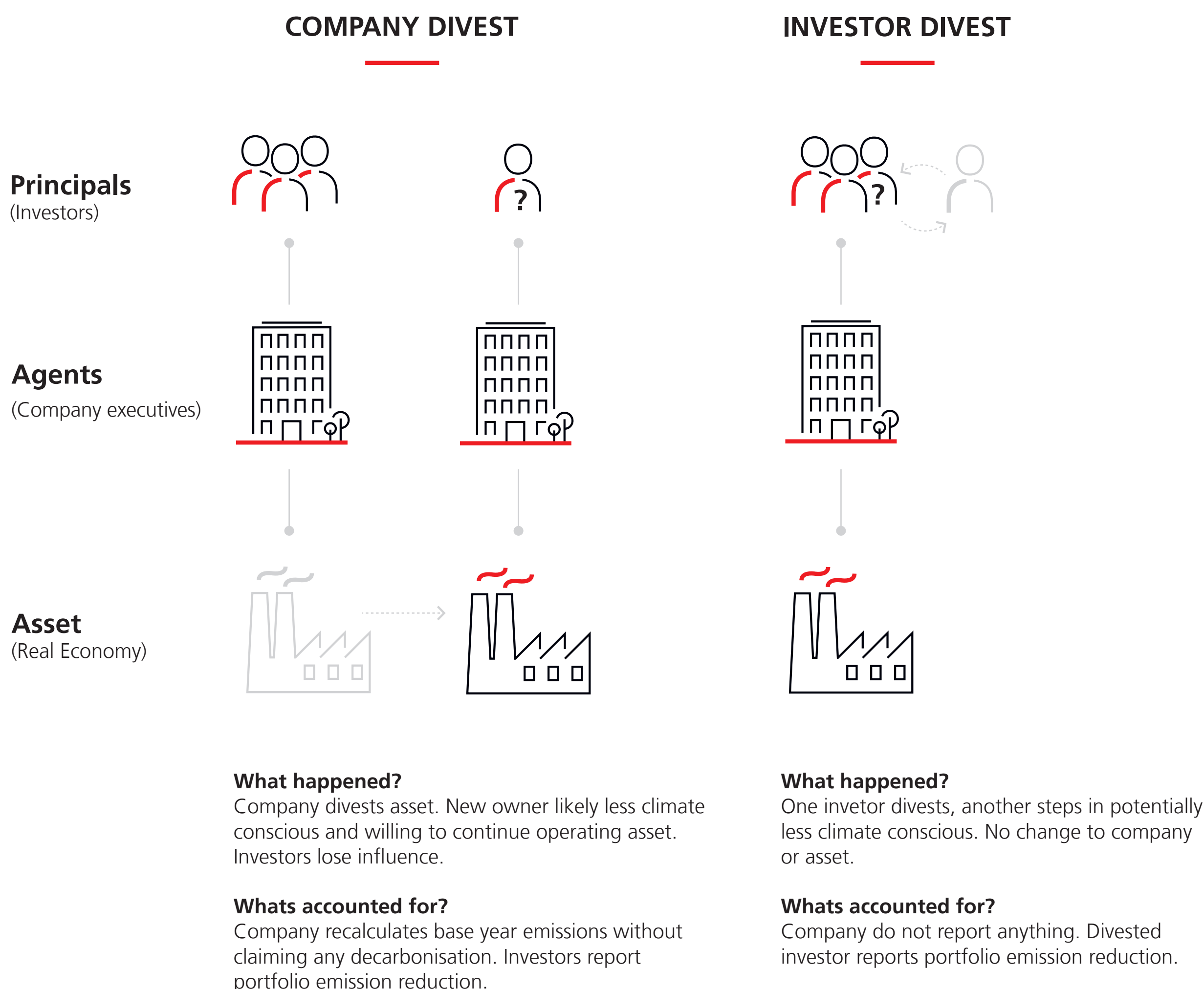


Figure 7: Source: The UBS Sustainability and Impact Institute, 2022.

Exposure to carbon emissions is a well-established portfolio consideration. It is often expressed as weighted average carbon intensity (WACI). As the race to net zero intensifies, risks such as stranded assets due to emission-intensity may become a more prominent driver of financial performance. Therefore reducing a portfolio's carbon exposure could lead to better risk-adjusted returns. But reducing a portfolio's carbon exposure does not necessarily reflect progress regarding climate in the real economy. This is because reductions can come from either portfolio alignment or real-economy decarbonization. This can be expressed as:

Change in WACI = Portfolio Alignment + Real-Economy Decarbonization

When an investor divests, e.g., replaces a high carbon-intensity company with one that has lower carbon intensity, a portfolio carbon reduction is achieved through alignment. This is similar to a company divesting emission-intensive assets. In both cases, the risk (and carbon exposure) is effectively transferred to the new owner (there is a buyer for every seller). But the emissions produced in the real economy have not changed and no measurable progress is made regarding climate change.

In contrast to companies, investors account for divestments as a reduction in portfolio emissions. On the other hand, real-economy decarbonization comes from retaining an ownership stake and urging companies to reduce their actual emissions.

Portfolio alignment and real-economy decarbonization can be calculated in such a way that together they add up to the change in WACI. To avoid misrepresentation, the change in WACI should also be inflation adjusted. Further advancements on this topic will highlight where real change is occurring.

Leila Sassi
Head of Sustainable Finance, *Holcim,* Switzerland

Antonio Carrillo Doblado
Global Head Climate and Energy, *Holcim,* Switzerland

Tell us about Holcim's decarbonization journey so far.
Our decarbonization journey started more than 20 years ago. However, since 2020, Holcim entered a new era of sustainability with our net-zero pledge.

In October 2021, we became one of the first companies worldwide – and the first in our sector – to have our 2050 net-zero targets validated by the SBTi in line with their new net-zero standard. This pathway to 2050 is based on scaling up and accelerating our 2030 levers, while also deploying next-generation technologies, such as novel binders, zero-emission vehicles, low-clinker cements, Carbon Capture Utilization and Storage (CCUS) and more.

More recently, we announced the launch of the world's first 1.5°C science-based framework to decarbonize the cement industry, resulting from our partnership with the SBTi. Alongside the launch of this framework, we submitted new 2030 targets aligned with a 1.5°C-aligned scenario for SBTi validation.

What is your main motivation behind these actions?
With today's rise in population and urbanization, we play a central role to build essential housing and infrastructure to improve living standards for everyone. That's why we are building better with less to accelerate the world's shift to net-zero.

As a global leader in innovative and sustainable building solutions, we are part of the solution. We are putting climate action at the heart of our strategy, to build progress for people and the planet.

What are Holcim's ambitions for the next 5–10 years?
Across our net-zero journey, we are focusing on several key levers of action to decarbonize the built environment. To reach our Scope 1 and 2 commitments, we will work on traditional decarbonization levers, such as reducing our clinker factor, increasing the use of alternative fuels and raw materials, increasing our use of renewable energy, scale up the use of calcined clay and develop novel cements and new binders.

Thammasat University Rooftop Farm (TURF)
Asia's largest rooftop farm, built with Firestone's UltraPly TPO 1.5 mm – 20,000 m² green roof in Thailand.

> "As a global leader in innovative and sustainable building solutions, we are part of the solution. We are putting climate action at the heart of our strategy, to build progress for people and the planet."

We will also accelerate the use of low-carbon products: we launched the world's first global ranges of green concrete, ECOPact, and green cement, ECOPlanet, with a CO_2 footprint ranging from 30% to 90% lower than the local market reference with no compromise in performance.

Next generation technologies such as Carbon Capture Utilization and Storage (CCUS) will also help to accelerate our decarbonization journey beyond 2030. Holcim is piloting more than thirty CCUS projects in Europe and North America. Working with other multinationals, as well as start-ups, we evaluate the pilots in terms of cost, technical feasibility, compatibility with CO_2 usage opportunities and other aspects of viability and scalability. In July 2022, Holcim secured two investments from the EU Innovation Fund for our breakthrough CCUS projects in Germany and Poland.

Circularity is also fully embedded in this strategy: we recycled 54 million metric tons of materials in 2021, up by 17% compared to the year before. This includes

"Sustainability is at the core of the construction sector's transformation and we see decarbonization and circularity as the opportunity of our time."

6.6 million metric tons of construction and demolition waste, representing more than 1,000 trucks per day.

In 2021, Holcim joined the First Movers Coalition (FMC), as a founding member, to drive more green demand and low-carbon technologies to advance our world's climate goals. On the green procurement side, we committed to FMC's trucking ambition of reaching 30% of zero-emission heavy-duty truck purchases or contracts by 2030.

Where do you see the main obstacles – what's holding you back from moving faster?
Given the scale of the challenge, no single organization can tackle it alone. The net-zero transition will require unprecedented collaboration.

- Between industry and policy makers in order to facilitate the development of the business case that is necessary to guarantee short- and long-term investments as well as develop market demand for low-carbon solutions and materials.
- Across the construction sector to integrate CO_2 performance across the entire value chain and alongside existing metrics such as safety, cost and durability.
- With our people and communities through proactive stakeholder engagement and involvement in the transition.

Public policies are central decarbonization enablers across all our markets. This ranges from carbon pricing mechanisms that provide adequate level playing fields on carbon costs between domestic

producers and importers all the way to carbon removal accounting protocols that recognize all carbon capture storage and use technologies or building codes that embed sustainability performance across the lifecycle.

What can the financial system do to support you better?
Holcim's agenda is one of green growth, with the objective of becoming the global leader in innovative and sustainable building solutions and reaching net-zero by 2050.

Sustainability is at the core of the construction sector's transformation and we see decarbonization and circularity as the opportunity of our time. We count on investors and the financial community to accompany companies like Holcim who walk-the-talk and have a clear strategy to tackle the current challenges.

In our view, the financial system should continue to support and invest in companies that have credible targets and roadmaps to decarbonize their business and companies that will make a difference. We need cement to make concrete. And we need concrete to build cities. We cannot meet current urbanization trends without solutions, so we need our bank partners and investors to help us continue our decarbonization journey.

We are seeing more financial institutions setting up targets to decarbonize their investment portfolios. We welcome this initiative and encourage investors to use holistic measures that consider direct and indirect (Scope 1, 2 and 3) emissions, and to look at emissions intensity, i.e. emissions per unit of material produced (in our case per ton of cementitious material).

Are there any key financial products missing across funding, advising or investments?
We welcome the development of new funding instruments such as sustainability-linked bonds which allows us to diversify our investor base and raise funding under better conditions while aligning our funding activities with our sustainability objectives and supporting the transition to a low-carbon and more resource-efficient economy.

Striatus – 3d concrete printed bridge
The first of its kind 3D concrete printed bridge in Venice is built with TectorPrint, Venice @ Studio NAARO.

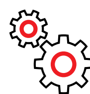
Key action: create market-based solutions

Understanding why investors choose a climate lens and developing better aligned metrics are two pieces of the same puzzle. What we also should consider is which solutions will most effectively facilitate decarbonization and what needs to be done to facilitate investments in them.

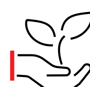
Government incentives are vital to curating capital investments. Subsidies, blended capital initiatives, tax breaks and other tools have found a permanent place in climate investing and often provide the much-needed confidence and first-loss provisions that essentially motivate private capital to take part.

In addition, philanthropic activities help scale highly targeted, often more localized solutions to key challenges. However, the ClimateWorks Foundation estimates that currently less than 2% of global philanthropic giving goes toward addressing the negative impacts of climate change.[4] While thus far limited, the engagement of philanthropic capital remains key – particularly in the public and civil sectors of developing markets.

For the required scale of addressing the climate crisis, solutions are likely to come from channelling capital and building partnerships around market-based solutions, i.e., those that succeed or fail because of the natural forces of the free market. They have three key advantages:



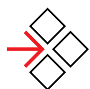
Efficiency.
If it is possible to solve a problem through a commercial solution, it is likely to be more efficiently delivered.



Financial sustainability.
Less reliance on donors to sustain long-term operations can improve visibility and accelerate impact-driven businesses' ability to scale.

[4] ClimateWorks Foundation (2021). Funding Trends 2021: Climate change mitigation philanthropy.

A marine current power underwater turbine on a test platform.



Product-market fit.
The success, or in some cases failure, of impact-driven companies rests on their ability to sell a product or service that presents a legitimate business use case.

In investment terms, this means that capital allocators are likely to be more incentivized to invest in what they believe to be profitable companies and projects. Therefore investors are more likely to target market-rate investment returns and impact at the same time. This dual objective setting is also known as a double bottom-line approach, and it is the foundation of impact investing.

The key challenge remains identifying and ultimately accessing these investment opportunities. Over the past decade, the financial industry has helped define and largely build a diverse set of investment tools and strategies to enable more impactful private capital. However, while smaller investors and family offices are flexible in their risk assessments, large institutional investors and banks are often more restricted. This is driven by regulation, investors' short-term return expectations and business considerations, such as costs and revenues. Nonetheless, it is the larger investors that could send a powerful market signal, by enabling toolboxes, investing in platforms or even underwriting investments that have the potential for impact.

This is not to say that sustainable and impact investing can, or ever should, replace government spending or philanthropy. Not all problems can be addressed through market-based solutions, nor can all populations be served using private-sector models. Not-for-profit capital may be most efficiently deployed for goals relating to public goods or those where establishing market-clearing price mechanisms for externality costs is difficult. However, by channelling investment to issues that can be addressed through market-based solutions, impact investing can redirect scarce government and philanthropic resources to where they are most needed.

Advising: guiding the transition journey

Advisors are often the first point of contact and education for clients regarding the sustainable options available, the outlook for emerging technologies and the opportunities to support scaling low-carbon solutions. As we discussed earlier, this requires broad systems and framework thinking, enabling financial institutions to serve clients from across functions.

Financial institutions that provide comprehensive sustainability training to their advisors are better positioned to accelerate growth and investments in the low-carbon transition. The tools and products available to drive sustainable investments are evolving quickly. This requires a near constant reassessment and re-education of what businesses need to transition and what clients and investors need to understand about the climate-related opportunities available to them.

Three key actions are important for advisory to move the needle on the low-carbon transition

- create innovative financial instruments
- recognize the financial value of green investments
- establish climate-transition task forces

› Key action: create innovative financial instruments for emerging green technologies

Advisors can educate corporate clients, highlight opportunities and bring parties together moving things forward towards deal execution. This is always a complex task, even more so for innovative frontier solutions that are not as easily understood or widely available. Investments in new and unproven low-carbon technologies are often riskier than existing technologies, both for the companies making the investments and the banks financing them. Many critical technologies are in early development, demonstration or prototype phases. Innovative financial structures can help to catalyze capital flows toward these vital emerging technologies and support them until they are cost competitive. Advisors play an important role in guiding and educating clients through the process so they can successfully capitalize on opportunities.

The climate investment needs in developing countries are estimated at over USD 2 trillion annually, but the OECD[5] reports that the amount of private investment mobilized has been stagnant at around USD 14 billion each year. Blended finance can play a catalytic role in helping accelerate financing toward emerging and new-frontier green technologies. This type of financial innovation is needed to help investments scale more quickly. Advisors can play a decisive role in creating awareness and driving acceptance toward making these offerings more mainstream.

High-income countries are already using blended finance to support innovations. For example, Breakthrough Energy, based in the US, has introduced a blended-finance mechanism to support the speedy transition to clean energy. This approach has reduced the costs of early-stage climate technologies, including long-duration energy storage, sustainable aviation fuel, direct air carbon capture and green hydrogen. Similar efforts would be useful in low- and middle-income countries, which urgently need assistance. Likewise, carbon-credit mechanisms that contribute to making green products more competitive also have potential to be impactful in developing economies.

[5] OECD, Forward-looking Scenarios of Climate Finance Provided and Mobilised by Developed Countries in 2021-2025, October 25, 2021. Accessed on August 31, 2022 via https://www.oecd.org/environment/forward-looking-scenarios-of-climate-finance-provided-and-mobilised-by-developed-countries-in-2021-2025-a53aac3b-en.htm

Ray Fuller

Senior Portfolio Manager,
Asset Management, UBS

We asked Ray Fuller to share his thoughts on what is now required to accelerate the transition to a low-carbon economy.

The transition to a low-carbon economy will require unprecedented levels of investment, innovation and structural change by governments, businesses and individuals alike. The voluntary carbon markets have a role to play in this transition, but it is crucial that these mechanisms do not operate as a replacement for taking direct action to decarbonize. Instead, they should offer a complementary solution to accelerate the reduction of both emissions and the impacts of climate change.

Many organizations recognize the crucial role of carbon avoidance and removal initiatives on the path to net zero and in meeting the Paris climate goals. In particular, technological offsets help accelerate efforts to decarbonize as these projects can catalyse the commercialization of emerging climate technologies. This will reduce the costs borne by companies and individuals on the path to net zero, particularly in hard-to-abate sectors.

Carbon offsets can also help us go further than net zero by creating an economic incentive related to climate value and accelerating funding to additional climate action initiatives. These “co-benefits” can support wider social inclusion, job creation and economic development, thereby facilitating a more resilient low-carbon economy.

Avoidance / Reduction

A project generating renewable energy would be classed as avoidance since this creates indirect emissions reductions by avoiding the need for fossil fuels.

Removal / Sequestration

The project itself removes carbon from the atmosphere either through nature-based sequestration or through technology.

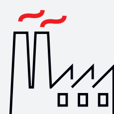
				
Category	**Technology-based reduction**	**Avoided nature loss**	**Nature-based sequestration**	**Technology-based removal**
Examples	Renewable energy Energy efficiency/ switching Transport	Avoided deforestation Avoided peatland impact Avoided coastal impact	Reforestation Peat restoration Coastal restoration	Bioenergy with Carbon Capture and Storage (BECCS) Direct Air Carbon Capture and Storage (DACCS)
Availability	High	Very high	Low	Very low
Credibility	Moderate	Low to moderate	Moderate to high	High
Cost				
Indicative Price (per tCO_2e)	USD 4–10	USD 10–20	USD 15–40	USD 130–500+

Figure 8: Source: UBS Asset Management, 2022.

Key action: recognize and monetize the financial value of green

Over time, as awareness about sustainable finance becomes more widespread, we believe that investors will expect more detailed green CAPEX disclosures from companies, and that they will openly question when investment levels are too low. In return, we expect markets to pay higher green valuation premiums. Financial advisors can provide corporate management with appropriate valuation frameworks that recognize their green investments and allow them to understand the shareholder value creation.[6]

Corporate valuation frameworks and investor education efforts can include several elements

- abatement technologies
- green CAPEX and OPEX
- carbon tax
- customer dynamics
- green valuation premium

While further research about these drivers is needed to derive more reliable results, they are already important tools in the financial advisor's toolbox. When the financial value of sustainable finance is more clearly illustrated and recognized, companies' actions and investor uptake are likely to accelerate.

We are already seeing companies across different sectors making decisions based on company- and location-specific marginal abatement cost curves (MACCs) and internal assumptions on future carbon pricing. MACCs are helpful visualizations of decarbonization pathways showing how technologies compare by cost and CO_2 abatement potential. These pathways can help the management of a firm plan, calculate and communicate their firm's ambitions in a structured and consistent manner. This work has the potential to become the foundation of a common vocabulary across industries, financial sectors and regulators.

[6] One such framework is described in the A4S Guide to Valuations and Climate Change, https://www.accountingforsustainability.org/valuations.html

Key action: establish climate-transition frameworks and task forces

The magnitude, complexity and urgency of climate-change challenges is putting tremendous pressure on financial institutions, as well as present immense commercial opportunities. Climate-transition task forces could prove useful in fully capturing the commercial opportunities. Ideally, these task forces will be cross-divisional, science-based in their approach and have deep sectoral and regional knowledge. The challenges associated with climate change will force financial institutions to reassess and think anew. This does not stop at financial product innovation, but extends to organizational changes as well.

The low-carbon transition will take place at different speeds across sectors and locations. Financial institutions and banks need to understand these dynamics and idiosyncrasies to be better positioned to advise their clients. Developing strategies that support their clients' net-zero targets and doing so while also hitting their own net-zero targets will be a delicate balancing act of rethinking risk appetites and delivering new services and products.

By working closely with their clients and industry peers in a symbiotic partnership financial advisors can influence and encourage the adoption of more sustainable practices and improved data disclosure requirements.

To achieve this, banks will benefit from having specialist client-facing teams that bring together expertise from multiple areas

– climate change
– abatement technologies
– regulatory developments
– valuation analytics

Teams equipped with the framework required to understand and talk about transition plans are better positioned to drive meaningful real-economy impact.

Conclusion: looking forward

The first steps have been taken toward decarbonization across industries and regions. Companies, investors, asset managers and financial-sector firms servicing them recognize the value in transitioning toward a collective net-zero future. Initiatives and collaborations have started to shape norms that will help guide meaningful actions. The steps taken so far were necessary, but not yet sufficient.

The next phase in climate financing presents an opportunity and imperative to affect real progress in not only transitioning away from emission-intensive sectors, but in working in partnership with all stakeholders to green the economy and help pollutive industries successfully make their own transitions. The efforts developed by the financial sector so far have helped build momentum, create awareness and establish climate financing as a keystone to a sustainable growth future. The scale of the climate-related challenges and the urgency needed to address them call for an increased focus on being effective and impactful more quickly. Deepening collaboration across sectors and stakeholders will help create the necessary frameworks, regulations, education and incentives for scalable action.

The financial sector has a great opportunity to create partnerships, innovate impactful and exciting financing options, mobilize capital in all its forms and drive effective solutions to move decarbonization of the real economy more quickly and more efficiently. The risks linked to inaction and a "business as usual" approach may be well known, but they are evolving in unpredictable ways. When we expand our focus to greening the future, enabling green solutions and models to take hold, augmenting exclusionary and divesting approaches, educating ourselves and our clients as to the opportunities, the potential for real, measurable, positive impact increases.

We are standing at an inflection point, where we feel a change in speed is needed. It is time to move beyond exclusions and reinforce our focus on engagement. By focusing on greening our collective future with renewed urgency and commitment, we can achieve our net-zero objectives and transform what tomorrow will bring.

About the Institute

The UBS Sustainability and Impact Institute was founded in 2021 to contribute to the sustainability debate, with a focus on actionable and timely contributions. The Institute is a collaborative effort with sustainability experts from across UBS's business divisions. We strive to encourage objective and fact-based debate, provide new impulses for action and identify innovations that will help shape our collective efforts and awareness about sustainability and impact.

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