Investments

Missing the Wood for the Trees

January 2022

Introduction

Imagine what the world could look like in 2050. Global warming is merely part of the story about how the human race found a way to live sustainably and avoided an inevitable crisis recounted in history books. In reality, the clock is ticking if we are to stand a chance to tackle global warming and avoid its likely irreversible effects on the earth's climate. In order to achieve this ambition, global cooperation between policymakers, business leaders, asset owners, and individuals is imperative.

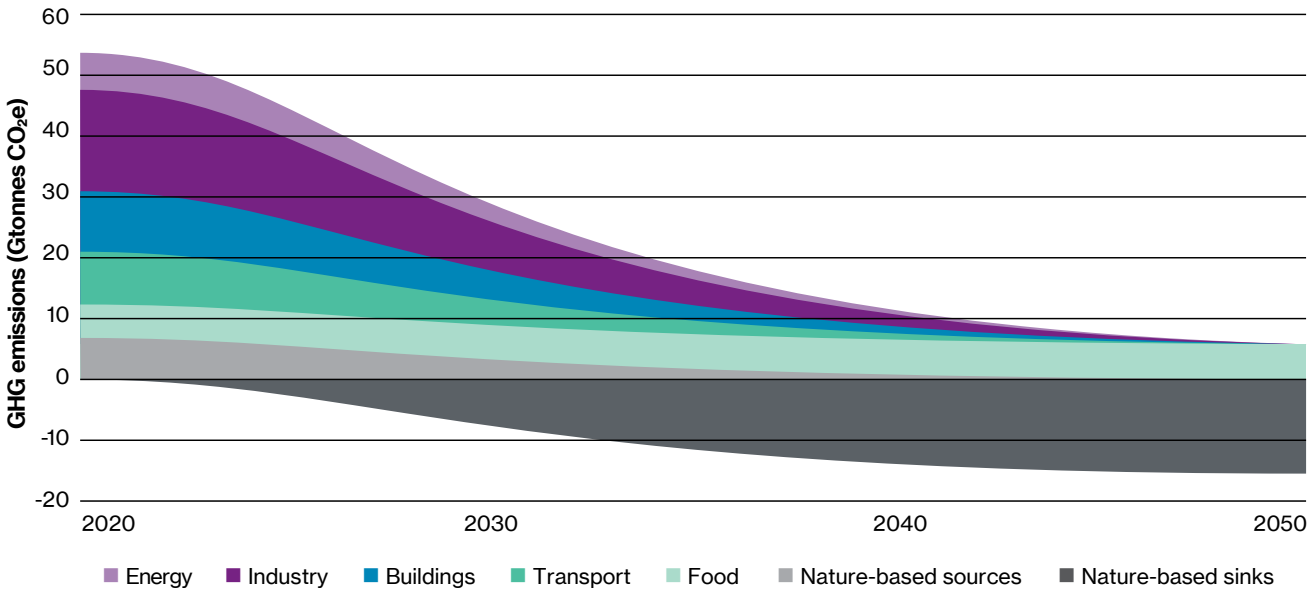
In this paper we'll explore what role nature-based solutions – commonly defined as solutions to climate change involving conserving, restoring or improving management of ecosystems to remove CO_2 from the atmosphere – play in the de-carbonisation challenge, the evolution of carbon pricing mechanisms, and how asset owners and corporates can manage risks associated with future emissions.

What role do nature-based solutions play in the de-carbonisation challenge?

A lot has changed but modest progress has been achieved since the Paris Agreement was established in 2015 between 196 parties. Even with the COVID-19 global pandemic unfolding for most of 2020 putting several economies on a standstill for extended periods of time, this slowdown merely resulted in an approximate 6.5% dent in the annual global emissions figure. To put this into context, annual global emissions are required to contract at a rate of 7.6% annually until 2030 if we are to stand a chance of limiting global warming to 1.5°C as per the goals of the Paris Agreement. (Henderson et al., 2020) Hence, despite a severe reduction in economic activity and international travel, most likely temporary, 2020 global emissions figures still fell short of the needed reduction.

Figure 1. **Exponential emission reduction pathways to limit global warming to 1.5°C**

Emissions reduction pathways for different sectors, following the Carbon Law. Energy emissions only include emissions related to the process of energy production – not energy-related emissions from other sectors.



Source: Exponential Roadmap Initiative, 2020

On the flip side there is a strong momentum from governments, corporates and investors to reduce global greenhouse gas emissions and to formalise commitments to achieve net-zero by 2050 to align with the goals of the Paris Agreement.

Economies need to significantly and immediately start reducing emissions, but realistically, some sectors are unlikely to become completely emission-free by 2050.

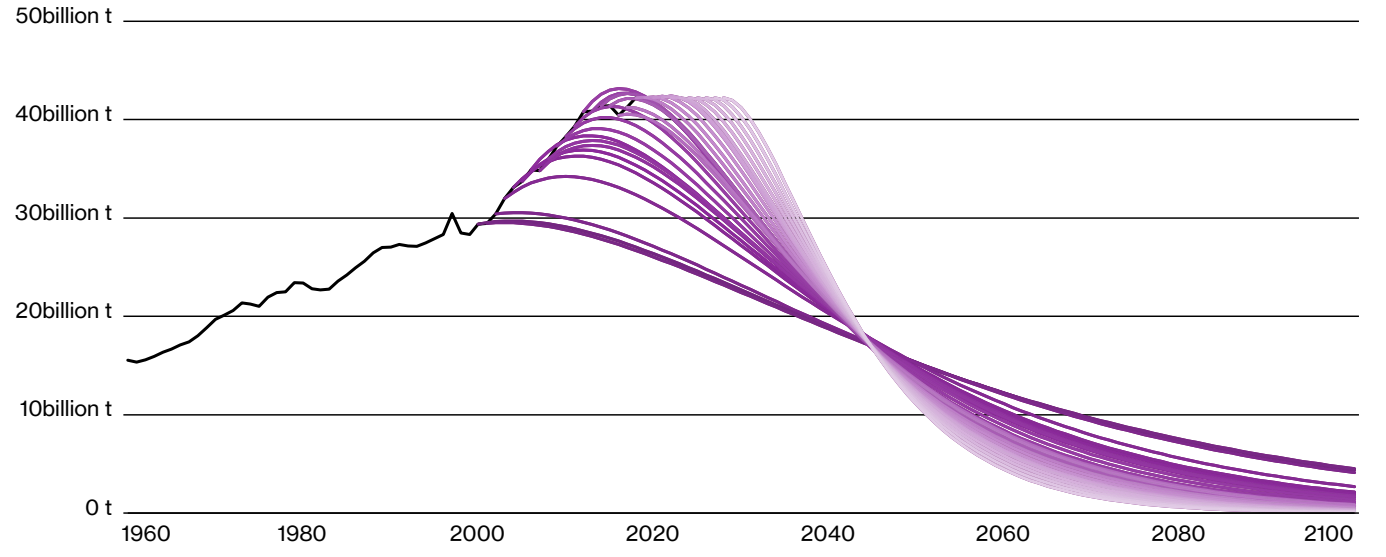
Due to the inability of certain sectors to reduce emissions fully by 2050, an alternative to account for their share of CO_2 emissions reductions must be sought. With net deforestation accounting for around 11% of global emissions annually and the fact that forests serve as carbon sinks, improved forest management can play a fundamental role in the de-carbonisation agenda. (FAO, 2021).

Deforestation is the process of converting forest land into other land use, usually with higher economic productivity. However, through this process, the natural carbon absorption and storage mechanism achieved through photosynthesis is lost. Net-zero ambitions require an equilibrium of emissions by 2050, whereby the quantity of emissions emitted is compensated by an equal amount of emissions captured and stored. This recognises that, whilst a significant portion of global emissions can be eliminated through electrification and other means, there will be residual unavoidable emissions in 2050 from sectors that are more difficult to de-carbonise (e.g. iron, steel, cement and aviation). Therefore, net deforestation rapidly needs to come to a halt and even be reversed to balance those unavoidable emissions. A McKinsey report put this bluntly: "[i]t is impossible to chart a 1.5-degree pathway that does not remove carbon dioxide to offset ongoing emissions. The math simply does not work". (McKinsey, 2020) The maths becomes increasingly more daunting the longer we take to de-carbonise the economy as is indicated by the graph below, demonstrating the drastic CO_2 reductions that must occur the later CO_2 reductions are undertaken.

On the carbon capture and storage front, there are a number of promising early-stage technologies such as direct air capture and bioenergy with carbon capture and storage (BECCS), but until these are proven at scale and are competitive, nature-based solutions (such as forestry and agriculture) remain the most effective and investible methods to capture and store carbon at scale. Carbon is captured and stored by trees via the natural biological growth process of photosynthesis. In addition to the wider benefits of carbon capture and storage, nature-based solutions can also increase biodiversity and generate economic value, through crops, creation of jobs, wood products, etc. More specifically, timberland, a sub-set of nature-based solutions, may also help in avoiding a significant amount of emissions created in the industrial process of making steel and concrete by substituting those materials with engineered wood products which also act as a long-term store of carbon in the buildings it is used in.

Figure 2. **CO_2 reductions needed to help global temperature rise below 2°C**

Annual emissions of carbon dioxide and various mitigation scenarios to keep global average temperature rise below 2°C. Scenarios are based on the CO_2 reductions necessary if mitigation had started – with global emissions peaking and quickly reducing – in the given year.

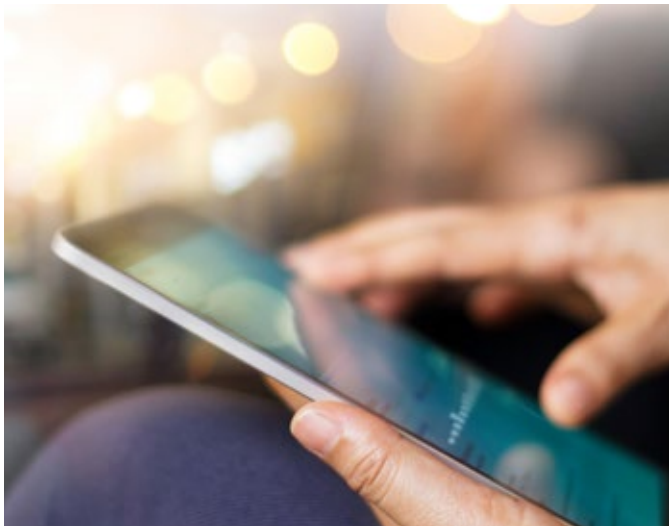


Source: Our World in Data, 2019

The evolution of carbon pricing mechanisms

A natural forest, in absence of any incentives or form of traditional economic valorisation, is a "non-producing asset" (unless it has commercial timber potential). When converted into land able to support alternative economic use, it then becomes "productive" and therefore more valuable, hence the deforestation trend.

While a natural forest may have traditionally been seen as a "non-producing asset", it has unparalleled natural benefits, ranging from supporting the biodiversity of its ecosystem, capturing and storing CO_2 and cooling of its surrounding environment and even serving as a flood defence, protecting against landslides or enhancing water retention in the ecosystem, none of which have traditionally been revealed in economic valuations. The ability to "value" these natural benefits may be important to ensure timely reduction of emissions and to help reduce deforestation and is connected to regulations around carbon emissions that will likely prove necessary in achieving this.

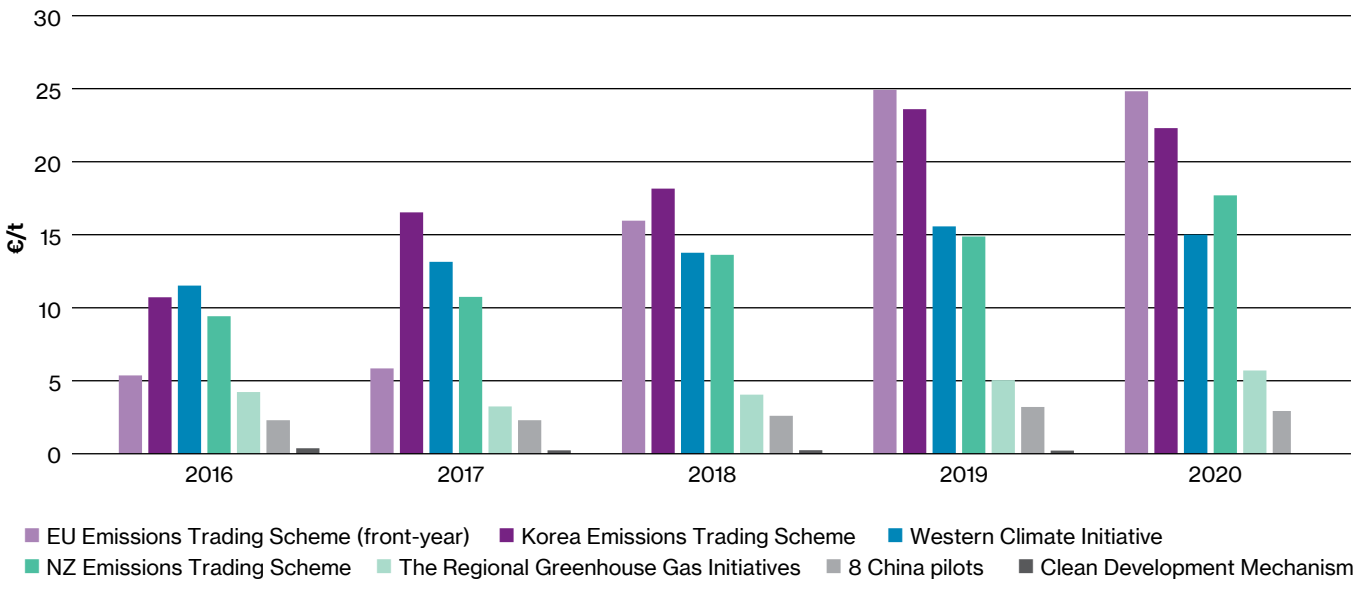


In recent years, there have been a number of systems developed to support both the reduction of carbon emissions and the safeguarding of natural habitats.

One example is carbon pricing mechanisms which work by setting a price for one tonne of carbon emitted. According to the World Bank: "[a] price on carbon helps shift the burden for the damage back to those who are responsible for it, and who can reduce it." (World Bank, 2020). Several carbon pricing systems already exist across the globe, which are helping to provide the mechanism to place a value on, i.e. price, the natural benefits from a forest.

Perhaps unsurprisingly, we observe a general upward trend in the price of carbon emissions across these various systems, a trajectory that is expected to continue according to experts on the subject. (Turner et al., 2021).

Figure 3. **Annual average price per tonne**

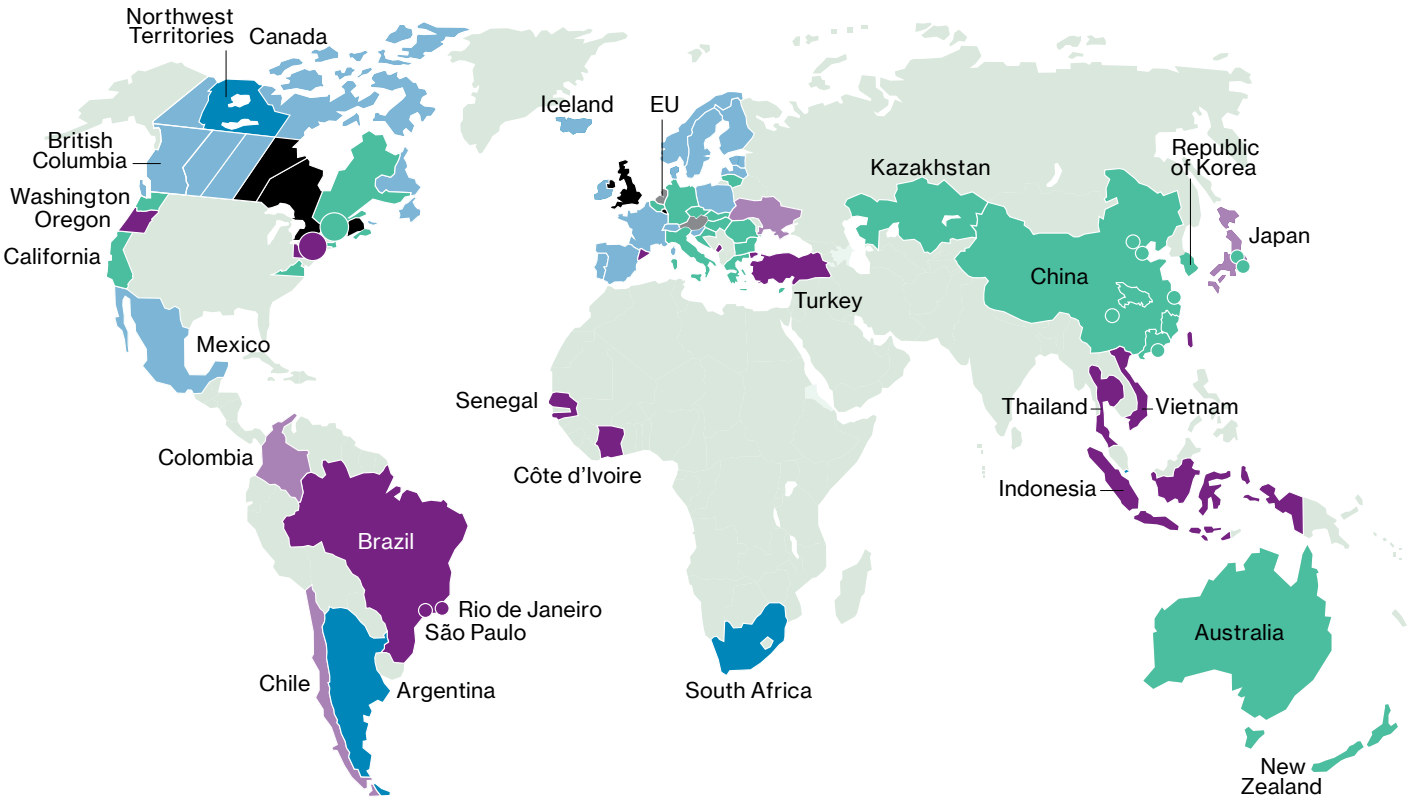


Source: Refinitiv, *Review Of Carbon Markets In 2020*, 26 January 2021

Carbon offsets[1] are either exchanged through regulated or unregulated markets. Regulated markets are mandatory for specific group actors where an established carbon reduction regime manages the market, often operating at the regional or national level. On the other hand, unregulated markets, also referred to as voluntary markets, are accessed by carbon emitters who choose to offset emissions through purchasing carbon offsets usually for a lower price than in regulated markets.

Carbon offsets are beginning to be used as a form of valorising forests that are not otherwise deemed "valuable" or "productive" from a timber perspective, by assigning an explicit monetary value to carbon captured by the natural photosynthesis process. Furthermore, carbon offsets, especially where regulated, may introduce a legal requirement onto plots of land to maintain a specific amount of carbon onsite for a specified period of time, further compelling the protection of forests.

Figure 4. **Carbon pricing initiatives implemented, scheduled for implementation and under consideration (Emissions Trading System (ETS) and carbon tax)**



- ETS implemented or scheduled for implementation
- Carbon tax implemented or scheduled for implementation
- ETS or carbon tax under consideration
- ETS and carbon tax implemented or scheduled
- Carbon tax implemented or scheduled, ETS under consideration
- ETS implemented or scheduled, ETS or carbon tax under consideration
- ETS and carbon tax implemented or scheduled, ETS or carbon tax under consideration

Source: Santikarn et al., 2020

The large circles represent cooperation initiatives on carbon pricing between subnational jurisdictions. The small circles represent carbon pricing initiatives in cities.

Note: Carbon pricing initiatives are considered "scheduled for implementation" once they have been formally adopted through legislation and have an official, planned start date. Carbon pricing initiatives are considered "under consideration" if the government has announced its intention to work towards the implementation of a carbon pricing initiative and this has been formally confirmed by official government sources. The carbon pricing initiatives have been classified in ETSs and carbon taxes according to how they operate technically. ETS not only refers to cap-and-trade systems, but also baseline-and-credit systems as seen in British Columbia and baseline-and-offset systems as seen in Australia. The authors recognize that other classifications are possible.

[1]A certificate attached to a project that attest to one tonne of carbon having been sequestered

How can asset owners and corporates manage risk associated with future emissions?

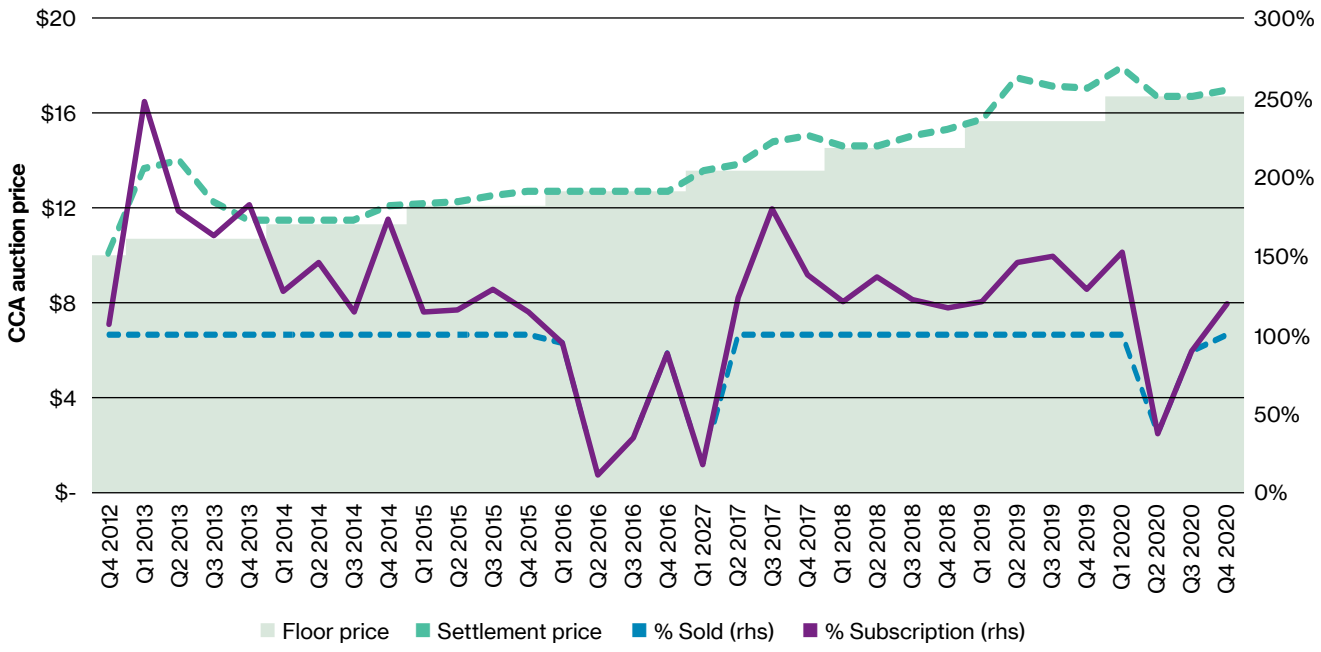
Investing in a forest project within California Air Resource Board (ARB) monitoring framework

The California cap and trade market (covering an economy the size of the fifth-largest economy in the world) is a program monitored by the California ARB which caps the state's annual carbon emissions via the Global Warming Solutions Act of 2006. This act mandates that the largest emitters must purchase rights to pollute, called California Carbon Allowances or CCAs. By enforcing an annual cap on its emissions, the state of California limits the amount of emissions permissible by the largest polluters. Each year, the annual emissions cap reduces in line with California targets, causing the carbon allowances supply to decrease and, all else equal, its price to increase thus creating a strong financial incentive for the highest polluters to de-carbonise their operations or internalise the cost of pollution.

Companies covered by the cap-and-trade market must purchase CCAs to cover the entirety of their annual emissions. However, they are allowed to purchase up to 8% of their annual emissions from regulated carbon offsets which are usually cheaper than CCAs. CCAs are issued by the government through regular auctions but are subject to a minimum price that increases annually with CPI+5% whilst California Carbon Offsets (CCOs) are typically trading at a c.10-25% discount relative to CCAs given the additional complexity in creating carbon offset projects, transactional processes, and limits on the usage of CCOs.

Carbon offsets are an important factor for asset owners of sustainably managed forests[2], since they offer an alternative monetisation route through the registration and sale of CCOs. As the forest grows organically every year, this additional growth can be monetised through timber harvest or carbon offsets sales. This interesting dynamic provides optionality for asset owners who want to maximise income by choosing the most valuable cashflows stream, improving the overall resilience of income generated from the asset whilst also safeguarding part of the asset on which CCOs are issued. Investors acquiring forestry assets covered under the California Cap-and-Trade market could see an increase in demand for its carbon offsets if adoption of this framework is widened outside of the current participants, namely the state of California and the Province of Quebec in Canada. Interestingly, the states of New York, Washington and the Province of Ontario in Canada are currently considering participation in the same Cap-and-Trade framework.

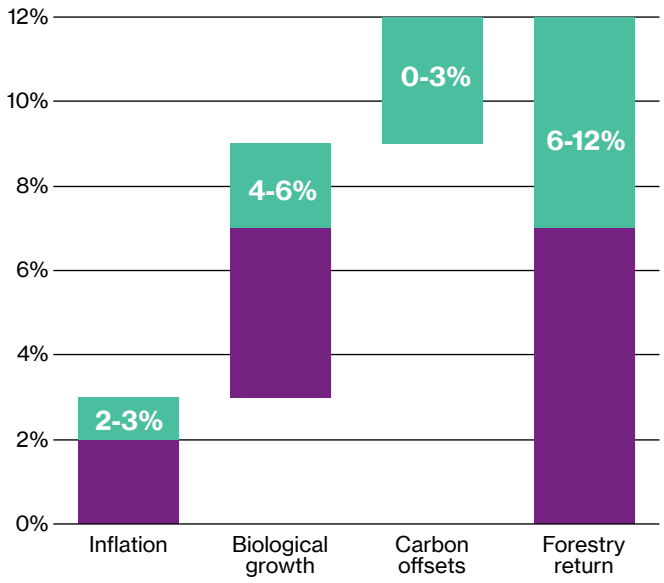
Figure 5. **CCAs quarterly auction data**



Source: California ARB Auction Data, Intercontinental Exchange (ICE), Independent Commodity Intelligence Service (ICIS), BGC Environmental Brokerage Services, 2020

[2]Forests managed sustainably where a number of trees equal to the biological growth of new trees can be harvested and sold as timber.

Figure 6. **Expected return build-up for a forestry investment with carbon offset potential**



Source: Willis Towers Watson, September 2021

The mechanism in which investors get paid for investing in timber has three key return drivers: timber price, biological growth, and carbon offsets. Timber price is generally assumed to move in line with inflation over the long-term. Biological growth varies between species, location and climate where this increases the amount of timber to be harvested.

Carbon offsets provide an uplift for trees that are considered worthless from a timber value perspective which are then monetised through the sale of offsets.

Furthermore, investors effectively have an option based on carbon offset pricing which is difficult to price, but we expect could increase faster than what is currently priced in and could become highly valuable in the future.

As an asset class, timberland not only can provide genuine diversification to traditional investments, but it also contributes toward climate solutions and can help clients achieve their ambitions around reducing the carbon intensity of their portfolio. Simultaneously, it can generate additional returns through the sale of carbon offsets and potentially provide inflation protection.

How can forestry investments safeguard biodiversity?

Most forestry investments are commercial plantations commonly composed of conifer trees with varying rotation cycles by species and are mostly harvested together at maturity for their timber. In contrast, mixed forests are composed of conifer and broadleaves trees, the latter are not suitable for harvesting as timber and therefore are of limited value. As a result, mixed forests have the highest carbon sequestration potential since only portions of those forests are harvested for its timber and usually are let to regenerate naturally after harvests.

Mixed forests are more akin to natural forests and most often can be managed under sustainable forest management practices, sometimes under certifications such as FSC forest management certification or PEFC sustainable forest management certification, which essentially means that the use of a forest must reflect its capacity to maintain biodiversity, to ensure productivity and to preserve the ecosystem. In short, to ensure timber harvests align with these certifications, the rate of wood harvested must be equal or lower than the regeneration potential of the forest.

What this means for a forest owner is that different portions of the forest are harvested periodically and allowed to regenerate naturally before future harvests, thus maintaining the integrity of the forest. In addition, under the California ARB the creation of carbon offsets establishes a requirement to maintain the corresponding amount of carbon on the asset further safeguarding the forest against intensive harvest that could reduce the biodiversity in the future.

Corporates can manage risks associated with future carbon emissions

Corporates are faced with a different challenge than investors. Depending on the mechanism in place and where companies operate, carbon pricing might already be internalised as a tax or operating cost, but for many jurisdictions, such requirements are not in force yet.

However, some corporates choose to offset their emissions for other reasons, such as being a way to fulfil their mission, meet customers' expectations or as a marketing tool to differentiate their products. As consumers become more aware of the need to decarbonise and governments execute on their plans toward decarbonising their respective economies, it would make sense to expect that higher emissions leads to higher costs in the future and as a result, a number of strategies can be undertaken to mitigate this:

1. Pay-as-you-go where corporates simply wait and see how carbon markets evolve and purchase necessary carbon credits or offsets at the prevailing price, effectively retaining regulatory, volume, and price risks.
2. Partnering with asset owners to secure a long-term stream of carbon credits or offsets either at an agreed volume and/or price to address unavoidable emissions likely to be generated by the company in the future; in doing so, volume and/or price risks can be mitigated but this may introduce counterparty risk.
3. Partnering with forestry managers to manage forestland and carbon credits or offsets registration processes on assets owned by corporates which can be used as a hedge against future carbon emissions. Carbon value can be accumulated, and carbon offsets registered as needed, thus mitigating volume and pricing risk but introducing asset price volatility associated with forestry.

Corporates that are least likely to reduce their emissions completely due to unavoidable emissions should try and understand the potential impact of unavoidable carbon emissions on their businesses and, where relevant, think of ways to help mitigate this risk, acting early to help avoid an unexpected increase in carbon emissions costs in the future.

Comparing a forest project within the California ARB with a portfolio of US onshore windfarms

Our clients have recently accessed a portfolio of operating onshore windfarms located in Illinois, USA where the expected return is 8.5%.

The underlying assets have an economic life of 30 years, during which most of the electricity revenues have been fixed in nominal term for a period of c.16 years under a contract with an investment grade corporate. The main operating costs have also been contracted out with reputable counterparties, but given the economic life extends beyond, there are some elements of market pricing exposure, such as electricity price, after the contracted period.

We believe the expected return potential from Forestry Investments can be similar to renewable energy, which is typically towards the lower end of the return spectrum versus private markets investments. However, Forestry investments offer an implicit hedge against inflation and a fairly explicit hedge against an environment where progression towards a net-zero global economy proves challenging and organisations are increasingly seeking investments offering carbon offset.

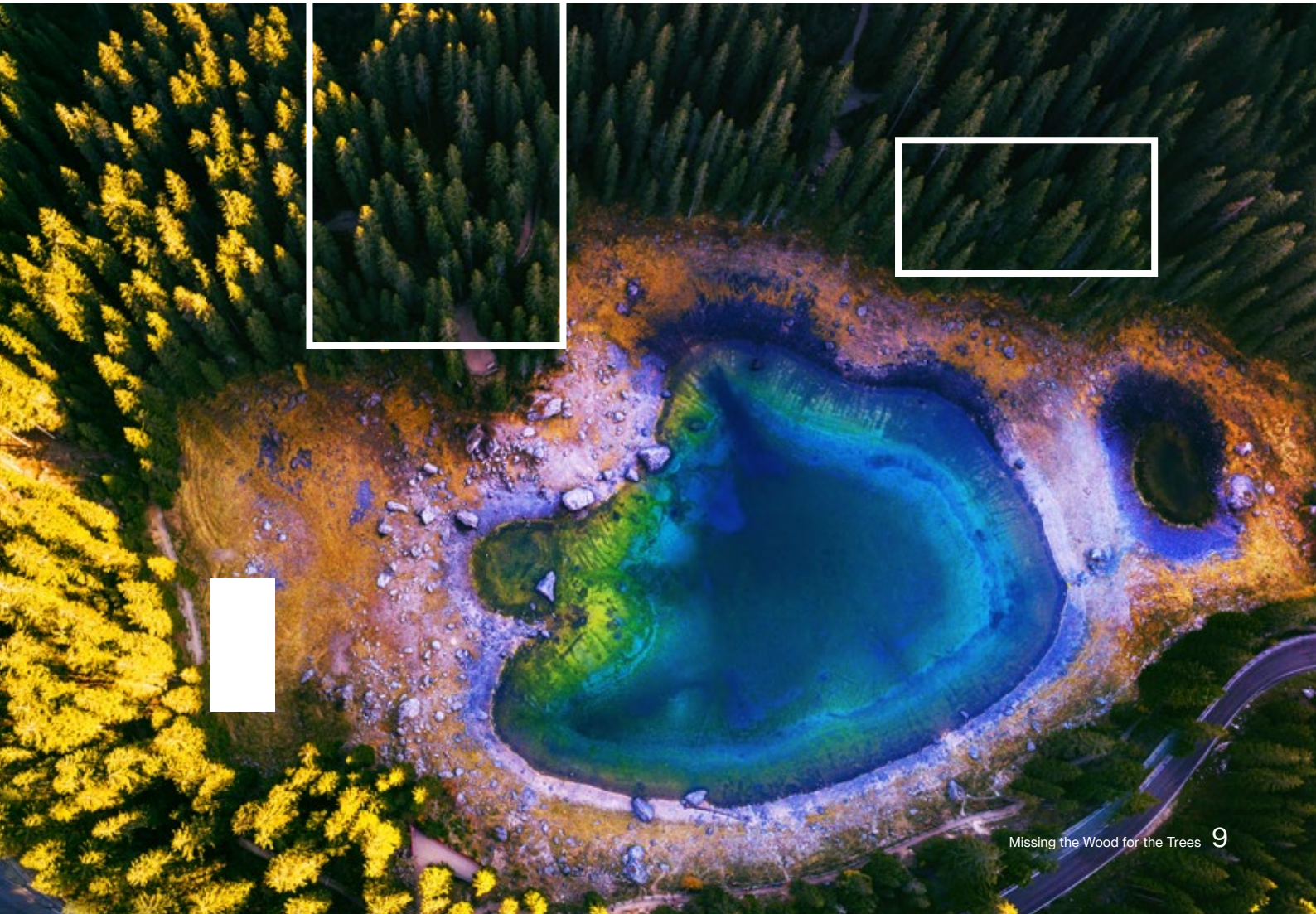
Conclusion

It is imperative that incentives are created such that the various economic actors reduce their emissions such that we stand a chance at fulfilling the goals of the Paris Agreement.

Although it is understood that nature-based solutions are not the whole solution and should not be undertaken in lieu of reducing carbon emissions, they will inevitably play a role in the decarbonisation challenge, whilst other forms of carbon capture and storage are more commercially developed.

Interest in and requirements to offset emissions are set to increase, which would suggest that carbon pricing and nature-based solutions could evolve from their nascent state to a mature market, with prices expected to increase. Institutional investors should consider the first-mover advantage in acquiring Forestry with strong carbon potential while the asset class remains priced in a historical context based on timber value or alternative use, rather than its additional climate positive potential.

In our analogy, the Trees represent the various changes and engagement activities that institutional investors can deploy to decarbonise portfolios. However, there is an important acknowledgement that the bigger picture and raft of measures required to achieved net zero, the Wood in our analogy, necessarily requires some carbon sequestration to be part of the decarbonisation puzzle. Investors and corporates with a long-term mindset should consider blending investments in Forestry and other nature-based solutions alongside the decarbonisation in their traditional investment portfolios.



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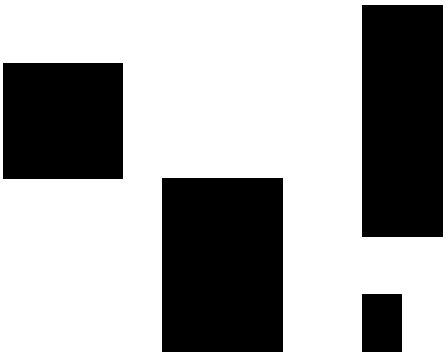

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