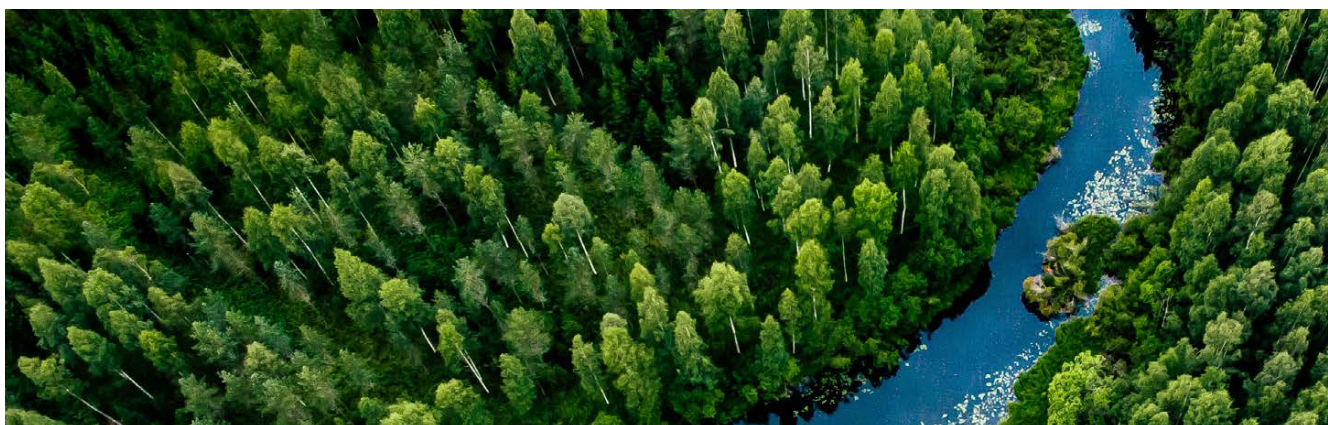


## TIMBER AND CARBON – A NEW PARADIGM?







Historically, timber as an asset class has been paid little attention by institutional investors in comparison to, for example, real estate and infrastructure, especially in Europe. This is now changing as market dynamics, the environmental imperative, and the macro risk environment all combine to refocus investor attention.



The world has recently entered a new era of uncertainty and volatility as a result of the Covid-19 pandemic, the Russian war against Ukraine and a weakening global economy on the back of steeply increased energy prices. As investors rebalance portfolios, there has been an emphasis on recalibrating their approach to risk and adding safer assets to allocations.

Against this backdrop, Aquila Capital strongly believes in the current and future qualities of timber as an asset class for institutional investors, with the following primary investment drivers:

- Strong, long term timber price trends,
- Climate change mitigation,
- Upside potential through asset optimisation, and
- Portfolio diversification.

## 1. Strong, long-term timber price trend

Timber prices are the major driver of realised forestry investment returns and are expected to increase in the medium to long term primarily as a result of the demand and supply imbalance on a global level.

Aquila Capital sees one major demand driver being the decarbonisation of the construction sector with the industry increasingly using timber as a substitute of concrete and steel, where possible. In conjunction with increasing urbanisation resulting from a growing world population, timber demand is expected to increase, strongly supporting timber prices.

Conversely, timber supply cannot be quickly increased to meet expected demand increases. Owing to the very nature of the product, trees reach maturity over a range of ages, depending on species and location. For example, this can vary from 6–8 years for pulpwood (eucalypts), 12–15 years for fast-growing poplar hybrids, 30–50 years for fast-growing pines and spruces, and over 100 years or more in temperate and tropical forests producing wood of large dimensions. A constrained supply of timber in the face of increased demand can therefore facilitate more attractive timber prices over a sustained period.



**TIMBER DEMAND:**

**Triple by  
2050<sup>1</sup>**

Estimations by FAO predict that the global demand for timber will triple by 2050, due to increase urbanisation and the need to decarbonise the construction sector.

<sup>1</sup> FAO Forest Product Statistics (2018); Forest Policy and Economics Vol. 119 (2020)


Aquila Capital as an international forestry manager closely monitors the market and price developments on a global as well as at a local level and seeks to time harvesting operations to optimise cash flows. Mid to short term volatility in certain markets can be mitigated through the conclusion of timber supply or fixed price agreements. An international timber portfolio allows the manager the flexibility to slow or stop harvesting operations in areas with weaker timber prices, and to take advantage of stronger timber prices in others.

The unique advantage of timber is that there is no need to harvest in times of lower timber price, allowing the trees to continue to grow in volume and value “on the stump”, preserving and increasing the capital value of the timber investment.

## 2. Climate change mitigation

April 2022 registered a new record<sup>2</sup> of the highest daily level of carbon dioxide in the atmosphere ever measured and served as a stark reminder that the world community needs to step up both carbon avoidance and, in particular, carbon removal efforts. With technical solutions still ineffective from a cost/benefit perspective, forests are today the only means for large-scale sequestration of carbon dioxide from the atmosphere and, therefore, are instrumental in the fight against climate change.

**AFFORESTATION:**  
**1 billion  
hectares<sup>3</sup>**  
IPCC calculations show that the  
afforestation of one billion hectares  
could help to achieve the 1.5°C target of the Paris  
Agreement and thus limit the worst effects of  
global warming.



Across all age classes, one hectare (ha) of forest in Central Europe binds approximately 12 tons of CO<sub>2</sub><sup>4</sup> annually through photosynthesis in below and above ground biomass. The total carbon sequestration ability is dependent on a variety of factors such as tree species, maturity, micro-climate, as well as nutrient and water availability.

In this context, sustainably managed forests under a suitable silvicultural regime will perform better in terms of their carbon sequestration function as compared to unmanaged forests. This is due to the fact that forest management entails routinely harvesting mature trees, which tend to bind less carbon dioxide from a certain age.



Therefore, investments in sustainably managed forests can play a vital role in combatting climate change. Structured in accordance with the applicable legal frameworks, timber investments may also contribute to achieving an investor's individual net zero goals in the context of disclosure to markets and stakeholders.

## 3. Upside potential through asset optimisation

Timber properties offer a large upside potential. Changes to the silvicultural regime, the amalgamation of smaller assets in larger portfolios, improvements to supporting infrastructure (e.g. road networks and access rights), and improvements within the applicable regulatory framework (e.g. increasing restocking areas under Long Term Forest Plans) tend to have a positive effect on the value of the relevant forestry asset or portfolio.

Managers of timber investments with the relevant expertise and organisation may, in addition, unlock income streams from forestry related and ancillary sources, such as carbon sequestration and renewable energy opportunities.

<sup>2</sup> Scripps Institution of Oceanography (2022)

<sup>3</sup> IPCC (2018)

<sup>4</sup> Encon website (2022)





In this regard, the generation and sale of carbon units in the compliance and/or voluntary market is nowadays the most prominent example for the monetisation of forest related ecosystem functions. The development of, for example, wind farms in suitable forest areas also adds value to an existing asset.

#### 4. Portfolio diversification

While the prices of timber properties are directly dependent upon the forecasted cash flows and changes in the market discount rate, the returns are not only driven by wood prices as a function of supply and demand, but also by biological growth.

Biological growth as a driver of yield, in turn, is completely independent of financial markets. Hence, decoupled from the economic fundamentals underlying financial assets. Forestry assets provide diversification and value protection in mixed portfolios as the future yield increases through biological growth even in times of uncertainty and volatility.

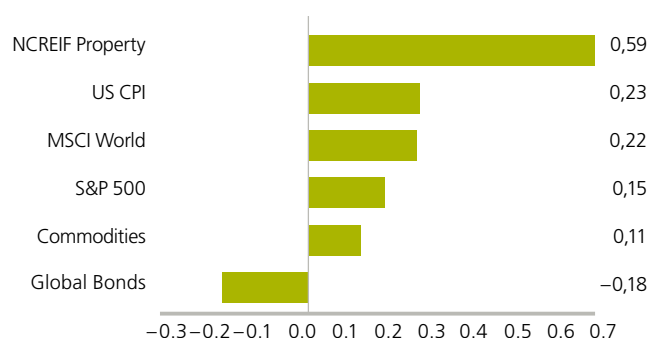
Apart from limited correlation with the prices of financial assets, the risk profile of forest investments may further be optimised through spatial, temporal, product, and market diversification. Managers of forestry investments with a deep understanding of the applicable silvicultural regime and functioning of the global timber markets can build portfolios comprising various jurisdictions on different continents, age class distributions as well as a suitable mix of tree species.

Diversification in this sense enhances the resilience of the timber portfolio to climate change and limits the exposure to adverse economic developments in one target country as timber markets are largely localised. Different age classes and trees species facilitate a wider range of wood products, which may further limit the reliance on specialised regional off-takers.

#### NCREIF correlations with other asset classes<sup>5</sup>

##### Timberland returns have low correlations with financial assets

Correlations with U.S. timberland, 2000 – 2021



<sup>5</sup> Bloomberg (2022).

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## 1. Strong, Long Term Timber Price Trends

### 1.1 Investment Focus

If you had invested in timber over 20 years ago, you would have done well.

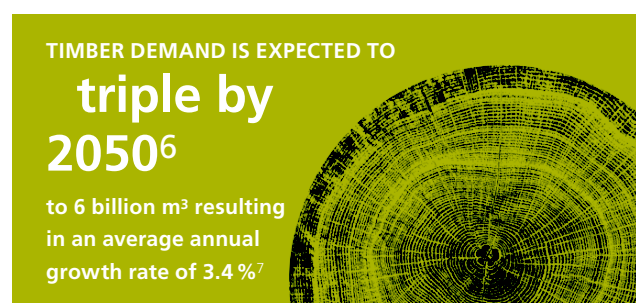
Timber has outperformed most traditional asset classes since 1992. In the 28 years to 2020, timberland had a mean return of 9.26 % a year, compared to 5.81 % for US fixed income, 5.49 % for non-US fixed income, 11.16 % for US equities and 7.5 % for non-US equities.<sup>6</sup>

An investment in a UK commercial forest would have provided a total investment return of 9.2 % on an annualised basis since 1992<sup>7</sup>. Total returns have continued to improve since 2017 when the MSCI UK Forestry Index was discontinued, with some market commentators showing total annualised returns in the UK of above 11 % to date.

Beside attractive returns, institutional investors with a long-term investment horizon in timber have enjoyed significant upside and, from an ESG perspective, a positive contribution to climate change mitigation through the sequestration of carbon as a by-product of forests' photosynthetic processes.

While the biological growth of the forests limits immediate supply expansions, a flexible harvesting window of around 10 years for commercial softwood offers opportunities to optimise yields through, the increase or limitation of the harvesting from the relevant forest in light of the actual timber price. Even the complete cessation of harvesting operations does not result in a loss of value, as forests continue to grow storing volume and value on the stump.

This distinctive feature of timber investments ensures relative independence from the prevailing business cycle. Demonstrably good timber returns over the last 20 years inevitably leads to the question of whether these returns will continue in the future. One of the key answers to that question is the demand and supply imbalance of the global timber trade.



### 1.2 Demand and Supply Imbalance

Whilst timber demand can fluctuate in accordance with global demand drivers, the timber supply is largely fixed and is based on the biological growth of trees. Increases in demand for wood can therefore not be met immediately, as long lead times (on average 25–45 years) are needed whilst newly forested softwood plantations mature and are brought into production.

In the face of increasing timber demand due to a growing world population, urbanisation, and decarbonisation of the construction sector through the replacement of steel, concrete and cement, this imbalance, in turn, is expected to lead to strong tailwinds for timber demand and, thus, an increase in timber prices.



<sup>6</sup> Nuveen Natural Capital "Investing in Timberland" September 2021

<sup>7</sup> MSCI Annual Forestry Index UK 2017

Continuously strong market fundamentals are reflective of these trends. Not only has the global demand for timber increased already by 35 %<sup>8</sup> over the past 20 years, but demand is expected to triple by 2050<sup>9</sup> to 6 billion m<sup>3</sup> resulting in an average annual growth rate of 3.4 %<sup>10</sup>.

This is good news for forest owners, as the overall return on a forest investment is determined by two factors:

- Appreciation in value of the asset driven by the speed and duration of the biological growth of the trees, the capital return; and
- The income generated from the sale of harvested timber less the expenditure for sustainably managing the property, the cash return.

### 1.3 Drivers of Timber Demand

Timber demand is strongly influenced by construction activity. Following the Global Financial Crisis in 2008/9, timber consumption decreased as a result of the slump in the number of US housing starts.

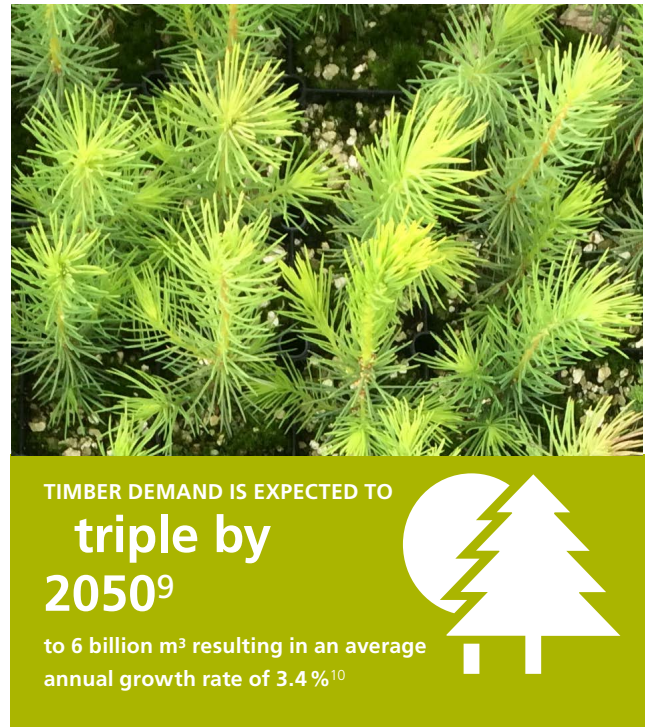
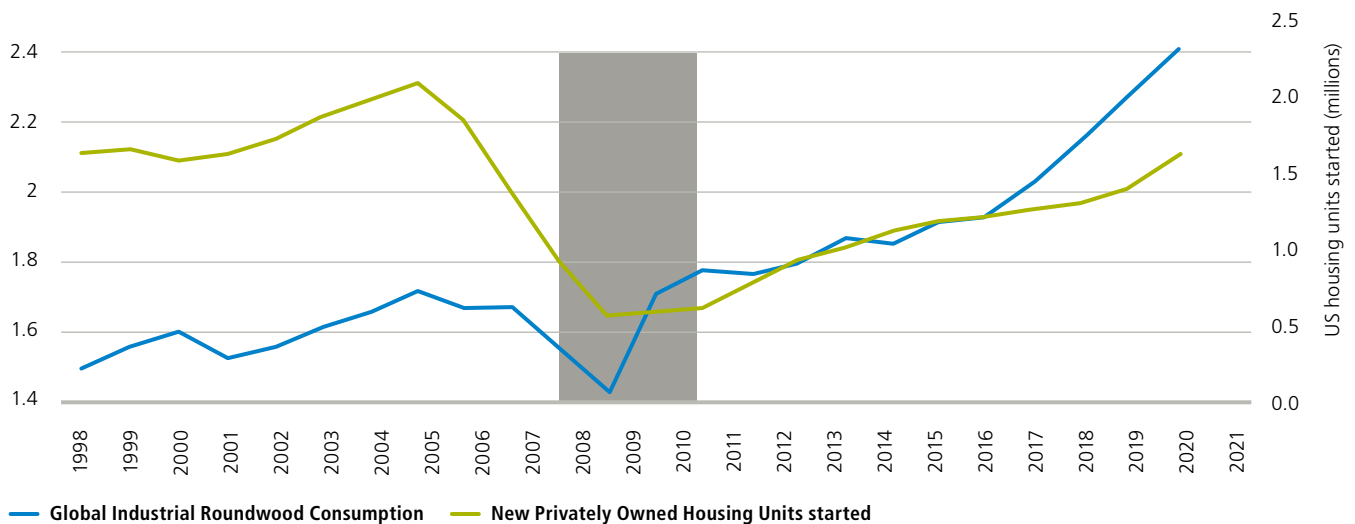


Figure 1: US housing starts and global industrial roundwood consumption (in billion m<sup>3</sup>)<sup>11</sup>



<sup>8</sup> FAO (2018)

<sup>9</sup> Forest Policy and Economics Publication Vol. 119 (2020)

<sup>10</sup> Aquila Capital Research (2022)

<sup>11</sup> US Census (2022); FAO (2018)



However, since then, a broader increase in demand for timber as a building material is being witnessed such as the use of Cross Laminated Timber (CLT), and other engineered wood products.

Historically, the use of timber in construction was limited to light-frame construction associated with low-rise residential buildings. Today, the possibilities are far greater. Recent research shows that up to 90 %<sup>12</sup> of new houses can be constructed from timber.

Beyond single-family homes, wood as a building material is also suitable for far more complex construction projects to manage the challenges of increasing urbanisation, as it is expected that by 2050, nearly 70 %<sup>13</sup> of the world's expected population will live in urban areas.



BY 2050, NEARLY

**70 % of the world's expected population  
will live in urban areas<sup>13</sup>**



As a result, demand for residential and commercial buildings and related infrastructure will increase significantly. In the wake of the growing risks of climate change, this requires an urgent rethink, because emissions from the construction sector greatly exacerbate the carbon burden on the atmosphere.

The Clean Energy Finance Corporation, an entity supported by the Australian Government, suggests that through the use of mass timber construction methods, as much as 75 % of embodied carbon emissions are cut compared to conventional steel and concrete designs<sup>14</sup>.

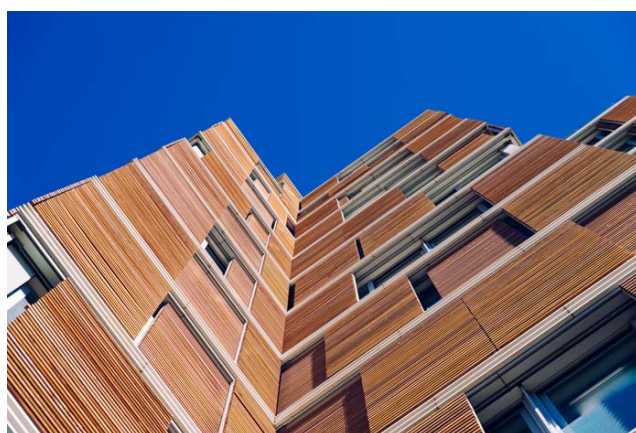
<sup>12</sup> *Buildings as a global carbon sink (2020) by Dr Galina Churkina*

<sup>13</sup> *UN (2018) World Urbanisation Prospectus*

<sup>14</sup> *Clean Energy Finance Corporation, CEFC Timber Building Program*

## 1.4 Timber – an alternative to concrete and steel?

On 15 November 2022, the United Nations projected that the world's population had reached 8 billion. With over 9 billion people expected by 2050<sup>15</sup>, the creation of related infrastructure to house an additional 1 billion people is expected to consume up to 60 % of the global carbon budget available to limit warming to 2°C.<sup>16</sup> This is based on emissions from the production of steel, concrete, asphalt and other dominant building materials.



But timber, arguably the oldest building material in the world, has the potential to reverse the emissions-intensive construction sector into a major positive contributor, central building block in the fight against climate change.

As opposed to merely avoiding emissions, like renewable energies do, forests actively remove carbon from the atmosphere and store it in the wood. Used as a building material, it not only avoids emissions by substituting concrete and steel, but also results in the sequestered carbon being permanently removed from the atmosphere.

The sustainable management of forests and afforestation projects is fundamental for the increase of the production of timber as a raw material. As demand increases, fast-growing plantations become ever more important to secure a steady and sufficient supply.

In 2010, planted forests occupied 7 % of the world's forest area, and grew 35 % of the global roundwood production<sup>17</sup>. As a result, sustainable management of our existing resources and its expansion over time contributes to the preservation of natural forests and enables us to meet the future (increasing) demand.

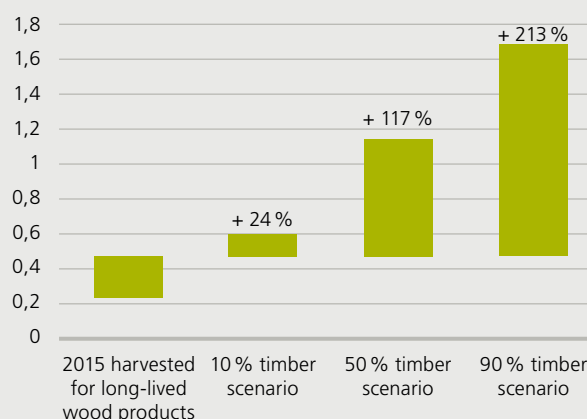
## Aquila Capital Transformation Award

The Aquila Capital Transformation Award supports innovative academic climate research that aims to find implementable solutions to mitigate climate change. In 2020, the prize was awarded to Dr Galina Churkina, who laid a scientific foundation for the transformation of the building sector with her research paper "Buildings as a global carbon sink".



The paper addresses the challenges of the building sector resulting from population growth and the ongoing development of the economy, while addressing the impact on related emissions. It shows the building sector in a climate-positive light by storing carbon sequestered in wood in buildings. Additionally, it shows that an increase in timber demand poses significant challenges.

**Figure 2: Range of additional roundwood consumption per scenario (Giga tonne of carbon GtC p.a.)**



According to the study, the demand for additional timber for the construction industry would more than double annually compared to the existing harvest for long-live wood products in a scenario whereby 90 % of new houses are constructed from timber obtained from sustainable sources.

<sup>15</sup> UN (2018) *World Urbanisation Prospectus*

<sup>16</sup> *Buildings as a global carbon sink (2020)* by Dr Galina Churkina

<sup>17</sup> FAO 2010 *Global Forest Resources Assessment*



## 2. Climate Change Mitigation

In order to mitigate the impact of climate change, it is crucial to limit global warming, ideally to a maximum of 1.5°C. In addition to avoiding further emissions from fossil fuels, the active reduction of greenhouse gases in the atmosphere is a cornerstone for achieving this goal.<sup>18</sup>

The sequestration of carbon dioxide from the atmosphere and its storage in wood is one of the most effective methods of carbon removal to date:

- On average over the past 20 years, existing forests have removed around 15.6 Gt<sup>19</sup> of CO<sub>2</sub> from the atmosphere annually.
- In relation to global emissions, forests compensated for about 45 %<sup>20</sup>, or about half, of global CO<sub>2</sub> emissions.

The increasing use of timber from sustainably managed forests as a building material can ensure the long-term storage of carbon.

In this context, the advantages over technical alternatives such as Direct Air Carbon Capture (DACC) of carbon extraction become

particularly clear. Trees extract CO<sub>2</sub> from the atmosphere and bind it in the form of wood. This wood can be used in part to replace emission-intensive building materials such as concrete and steel.

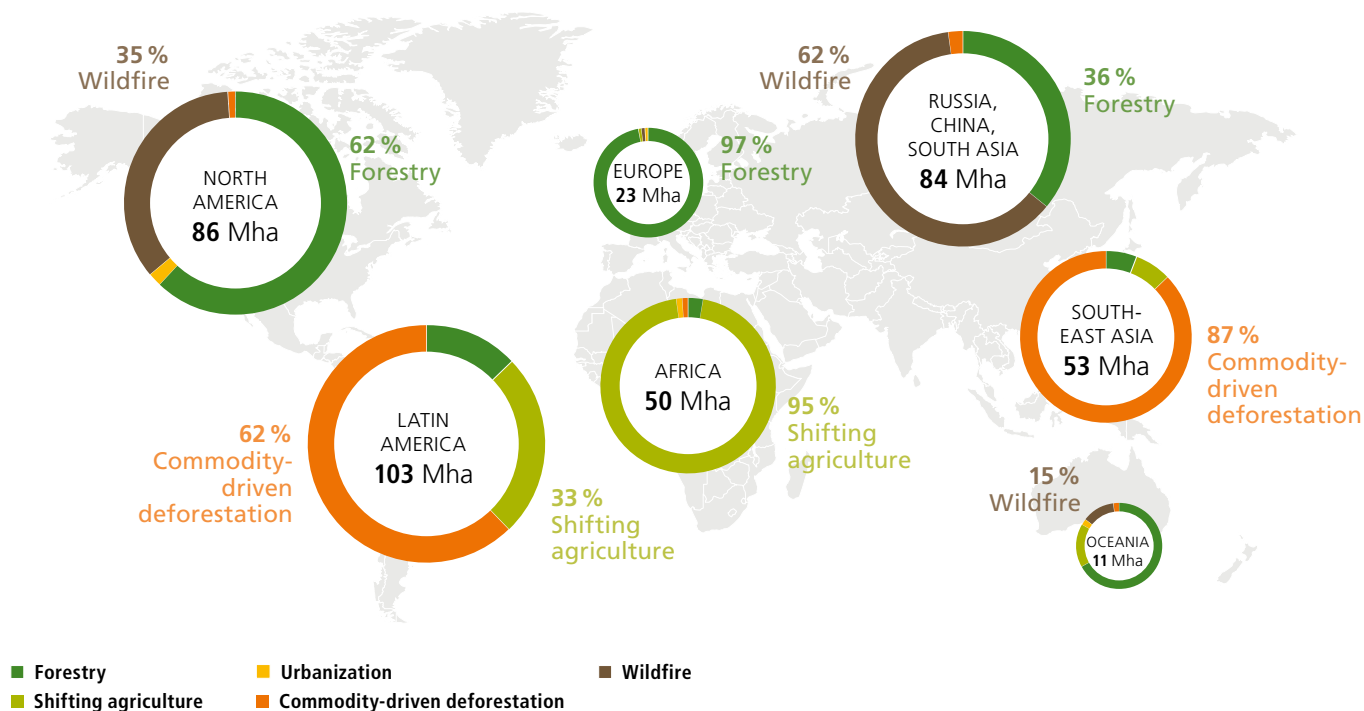
Technical alternatives such as DACC, on the other hand, are often associated with high energy demand, which, together with the subsequent technically demanding and problematic storage, make the process extremely cost-intensive and far less efficient.

### 2.1 Timber: An essential tool of carbon removal

Tropical forests remove the most CO<sub>2</sub> from the atmosphere due to the strong growth rates in comparison to northern or southern hemisphere rates. They are also responsible for about two thirds of the emissions by forests through forest fires, slash-and-burn land clearing techniques, land conversion and deforestation.

These measures are dangerous as it prevents carbon uptake from the lost trees, and it also releases the previously stored carbon. Forests in tropical climate regions are particularly affected by these developments.

Figure 2: Global Deforestation according to motives<sup>21</sup>



<sup>18</sup> Intergovernmental Panel on Climate Change (IPCC 2021)

<sup>19</sup> World Resources Institute (2022)

<sup>20</sup> Our World in Data (2022)

<sup>21</sup> Curtis et al (2018) in World Resources Institute (2022)

Approximately 90 %<sup>22</sup> of tropical deforestation is due to the expansion of agriculture and the extraction of raw materials (See Fig. 2) in Latin America, Africa and South East Asia. Permanent deforestation can be assumed, with reforestation being considered unlikely. Illegal logging and prevailing slash-and-burn methods are destroying existing carbon sinks.

In the rest of the world, led by Europe with a 95 % share, 50 % of logging occurs in the context of managed forests. In contrast to the tropics, these areas, as well as regions affected by forest fires, are usually reforested.

## 2.2 Benefits of Managed Forests

Sustainable management of forests leads to positive effects on the long-term storage of sequestered carbon, which can exceed the effects of primary forests many times over<sup>23</sup>. Across all age classes, one hectare of forest in Central Europe binds approximately 12 tons CO<sub>2</sub><sup>24</sup> annually through photosynthesis in below and above ground biomass. The total carbon sequestration ability is dependent on a variety of factors such as tree species, maturity, micro-climate, as well as nutrient and water availability.

From a climate perspective, commercially used forests and the associated timber harvesting are clearly positive. Assuming that the harvested wood is used in the construction sector, Aquila Capital believe that the cumulative carbon extraction and storage is many times higher than in primary forests.

The carbon storage of primary forests is limited by finite growth and decomposition. Nevertheless, they are of fundamental importance as ecosystems and custodians of biodiversity. The goal must be a balanced relationship between managed commercial forests and primary forests.

In addition, there are further benefits to be gained from the management of commercial forests, as in many cases they also have a higher resistance to environmental impacts through fire and wind breaks. Additionally, commercial forests provide employment opportunities in rural areas, and produces three times<sup>25</sup> the economic output of farming before subsidy or grant.

### The Global Tree Restoration Potential

In 2019, researchers at ETH Zurich examined the global potential for afforestation, and concluded that excluding existing forests, agricultural production and urban areas, 0.9 billion hectares worldwide have the natural potential to be afforested<sup>26</sup>.

This result offers hope as the IPCC found that around 1 billion hectares of new forests would have to be planted by 2050 in order to achieve the 1.5°C target.

The afforestation of 0.9 billion ha could sequester around 205 gigatonnes ("Gt" or a billion tonnes) of carbon at maturity, which corresponds to about two-thirds of the anthropogenic atmospheric carbon load of around 300 Gt<sup>27</sup> of carbon to date.

Afforestation on this scale clearly requires capital that only the private sector can raise. Based on average afforestation costs of EUR 5,000/ha, the afforestation of 0.9 billion hectares of marginal land would require a capital investment of around EUR 4.5 trillion<sup>28</sup>.



<sup>22</sup> Aquila Capital Research, World Resources Institute (2022)

<sup>23</sup> World Resources Institute (2022)

<sup>24</sup> Encon website (2022)

<sup>25</sup> Eskdalemuir (Scottish Borders): A comparison of forestry and hill farming; productivity and economic impact, commissioned by Confor, February 2014

<sup>26</sup> The Global Tree Restoration Potential (2019) Bastin et al

<sup>27</sup> The Global Tree Restoration Potential (2019) Bastin et al

<sup>28</sup> Aquila Capital Research



## 2.3 Natural Climate Solutions

Natural Climate Solutions (“NCS”) represent conservation, restoration and improved land management actions that increase carbon storage or avoid greenhouse gas emissions in landscapes and wetlands across the globe. Investments into these types of projects are gaining momentum driven by a desire to provide environmental solutions to the world’s climate crisis.

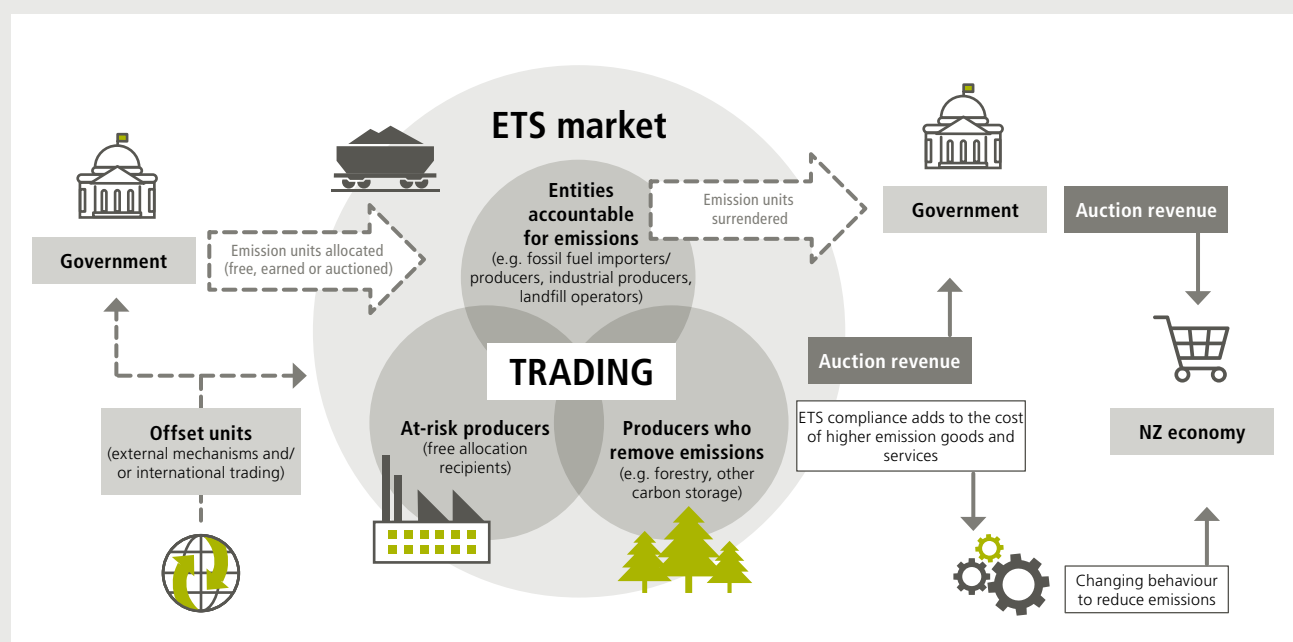
While the demand for investments in NCS projects from pension funds, financial institutions, and corporates is increasingly driven by their stakeholders’ sustainable investment aspirations, it is important to realize that the impact of these aspirations on expected investment returns is subject to a variety of sometimes difficult assessable factors.

In comparison to „classical“ timber investments, whose associated cash flows and resulting investment are largely based on timber prices and well understood, the situation is decidedly more complicated when it comes to NCS projects. While there seems to be broad consensus that the carbon market on the back of increasing carbon prices will become a very important feature of the global economy going forward, the legal and regulatory frameworks as a necessary precondition are still highly fragmented, incoherent, or just non-existent.

### New Zealand – a case study in carbon

The New Zealand Emissions Trading Scheme (NZ ETS) was started in 2008 and continues to serve as the primary driver for New Zealand’s climate change policy. Industries affected are energy, transport, heavy industry, waste industry and producers of synthetic greenhouse gases. Forestry is both responsible for emis-

sions but also is able to offer units for sale to other industries. By 2030, emissions are to be reduced by 30 % compared to 2005, with the long-term goal of eliminating all emissions by 2050<sup>29</sup>. The following diagram<sup>30</sup> presents the mechanics of the NZ ETS market.



### Aquila Capital in New Zealand

Aquila Capital has been invested in New Zealand since 2010 with an investment in several organic dairy farms. In 2020, Aquila Capital made its first forestry and carbon related investment in Te Rata Forest. The purchase of this property had a strategic focus on carbon credits (“NZUs”) in addition to the traditional forestry revenue components.

At the time of the acquisition, the price of NZUs was approximately NZ\$30, and now the price is NZ\$80. The demand for NZUs is high and prices are expected to increase further.

Aquila Capital has recently acquired Waitaanga Forest in New Zealand, a 993 hectare, young forest generating NZUs, with the timber element leased to the Crown, the New Zealand government.

<sup>29</sup> New Zealand, Ministry for the Environment 2022

<sup>30</sup> NZ ETS Market mechanics from Motu (2018) – A guide to the NZ ETS

### 3. Sustainable Asset Optimisation

The focus of any investment is to add value to it during the period of ownership.

In order to optimise a timber or NCS related investment, the owner should focus on the achievement of higher and better use (“HBU”) for the property. Adding additional value over and above the timber value may mean the development of an onshore wind farm or the generation of carbon and/or biodiversity credits.

Professional forest and land management will ensure that the property is managed sustainably and to standards that will enhance value, rather than diminish it. A forestry and / or NCS investment is a long term investment, and improvements in value will take time to plan and implement. The engagement with different stakeholders in respect of a land holding can be challenging and time consuming and that is why it is critical to appoint an excellent, qualified, and professional land manager.

#### 3.1 Higher and Better Use (“HBU”)

Forest and land investments open up additional opportunities beyond timber production, such as renewable energy generation (wind farms, hydroelectric power), battery storage and carbon and biodiversity credits.

##### Renewable Energy

Creating added value as a result of the development of a renewable energy generating asset in the property remains an objective of the owner as long as governments worldwide seek the generation of electricity from sustainable sources.

In order for the European Union to meet its objective of generating 40 % of its energy from renewable sources by 2030, it must build more onshore wind farms. The EU needs to build 32GWs of new wind farms (onshore and offshore) per annum in order to achieve this goal. In 2021, the EU built just 17GW<sup>31</sup>.

Forests are increasingly coming into focus in the search for suitable renewable energy sites, and with the introduction of taller wind turbines, the impact to the commercial timber below is becoming less relevant.

While the construction and operation of wind turbines in forests leads to very specific challenges, it is in the hands of the owners or managers to bring together different stakeholders such as foresters, conservationists, and renewable energy experts in order to minimise impacts on nature and people.



For investors, this opens up the possibility of diversifying the cash flow profiles of forest investments through rental income, which has a positive effect on the land value in the long term.

Aquila Capital is currently exploring the opportunities to develop a wind farm on three of its properties held by one of its forestry funds. If developed and built, a wind farm provides a rental income to the fund, allowing the timber to remain on the stump for as long as possible, driving additional value as the tree, through biological growth, moves through different volume categories and thus into higher value categories.

##### Carbon and Biodiversity Credits

Monetary incentives in the form, for example, of tradable carbon credits offer ways to make climate positive investments such as NCS projects economically viable and an attractive addition to a commercial timber portfolio.

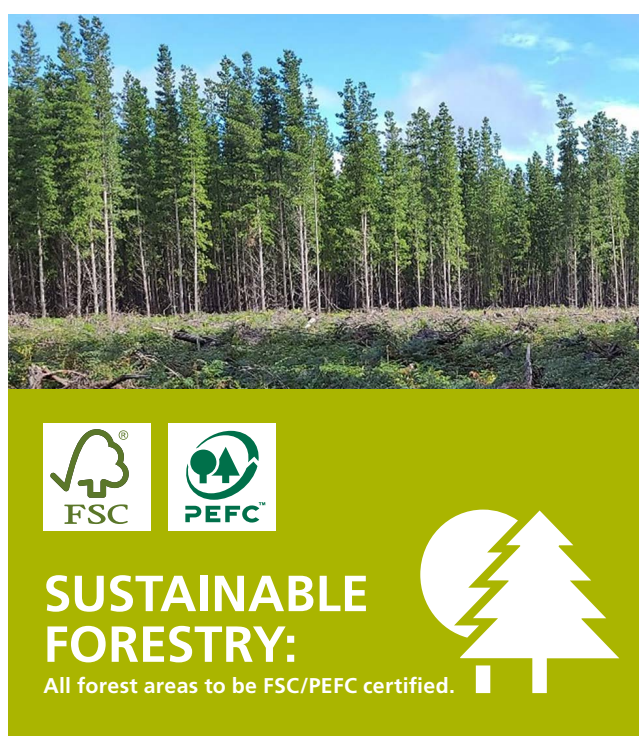
Today, forestry investments in New Zealand, for example, can already derive an additional upside of 15–20 %<sup>32</sup> of the overall investment return from the sale of New Zealand Units (NZU) in the (compliance) market under the NZ ETS with a price cap and, more importantly, a price floor set by the legislator.

<sup>31</sup> Wind energy in Europe: 2021 Statistics and the outlook for 2022-2026

<sup>32</sup> Aquila Capital Research



In the UK, however, carbon credits generated and then verified under the Woodland Carbon Code (WCC) are being mainly sold over the counter to off-takers who acquire the credits on a voluntary basis and, therefore, at a price which is subject to negotiation. Carbon credits which can be sold on an international level (i.e. not just only within NZ or UK as it's the case with NZUs or credits under the WCC) can be generated at scale only if additionality can be demonstrated to the relevant privately organized certification bodies (Verra, Gold Standard, VCS etc.), which tends to be more likely in non-OECD-jurisdictions.



So, while the monetization of forest-related ecosystem services like water purification, erosion protection, biodiversity and, most prominently, carbon sequestration provide NCS projects with the chance of upside potential, price and country risks as well as legal and regulatory challenges still pose an undeniable threat to their economic viability. Hence, if exposure to NCS projects is required, a combination with commercial timber as downside protection seems to be a rational approach.

### 3.2 Professional Forest / Land Management

The management of a commercial forest or NCS related investment should not be seen as in conflict with sustainability; rather, it is in the interest of long-term investors to make the management of the investment sustainable.

Firstly, certification of the forest ensures that it is being managed to an internationally recognised forestry standard which allows for sustainable commercial management of the forest but importantly it requires environmental standards are adhered to, ensuring biodiversity and improving ecosystem services within the commercial forest. It requires an element of natural and mixed species to be planted in the forest, ultimately strengthening the resilience of the forest to challenging environmental influences. Hence, Aquila Capital seeks to ensure that all forests are certified to either FSC or PEFC Standards<sup>33</sup>.

Secondly, Aquila Capital looks to restructure the forest to not only create a more resilient forest by species, but also to ensure that suitable infrastructure, roads and new fencing are built in order to allow the sustainable harvesting of the commercial crop.

Furthermore, by identifying the less productive areas within a property, the growth of native tree species are encouraged that do not have a commercial use but enhance the forest through biodiversity improvements.

Professional forest managers are trained to identify value in the forest on multiple levels. Aquila Capital provides the strategic direction for the property and provides the close oversight of the forest management company to drive value for the underlying investor.

Managers of international forestry investments will have embedded within the organisation, the relevant risk management functions, compliance, tax and structuring, etc including the ability to limit the foreign exchange risk through suitable hedging instruments.

<sup>33</sup> Aquila Capital Timber Investment Fund, Impact Report 2021

#### 4. Portfolio Diversification

As of the end of 2020, institutionally adopted Alternative Investments represented approximately US-Dollar 18 trillion in assets under management, or 12 % of the US-Dollar 153 trillion market<sup>34</sup> but this is expected to double up to 24 % by 2025.

If the allocation to Alternative Investments is expected to increase within investor portfolios, exposure to forestry, timber and carbon is likely to increase, as investors seek to spread their risk, obtain stable returns, and contribute to their sustainability requirements.

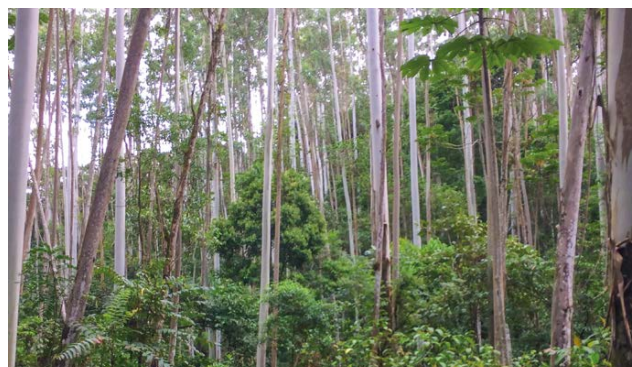
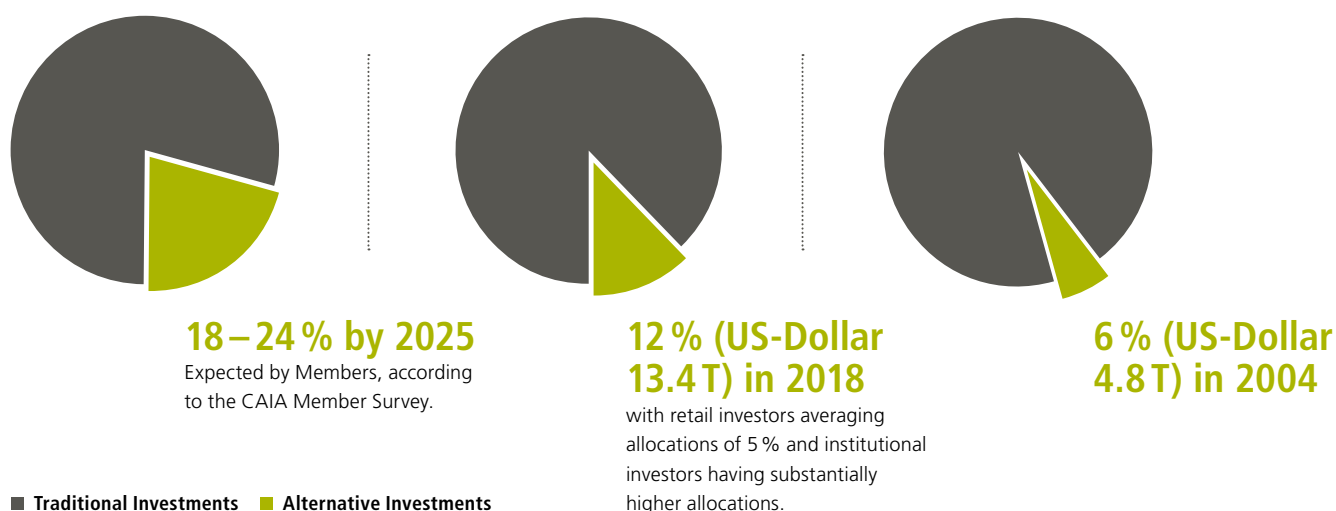


Figure 3: Percentage of Global Investable Market in Alternatives



##### 4.1 Geographical and Age Diversification

An international timber portfolio can be designed to diversify the investment risk and the return, at the same time providing a dynamic and flexible portfolio, that allows for stable cash flows.

The geographical location of the portfolio allows the flexibility to ensure that harvesting can be maximised in areas of higher timber prices, and limited when timber prices are lower, spreading the timber price risk on a global basis.

The age class of the portfolio allows for either an income return (mature crop) or a capital return (young plantation), however an investor wanting an income return is impacted by any short term changes in the timber price. An even aged class portfolio will allow the owner to develop a stable, and low risk cash flow, subject to timber prices remaining stable.

A combination of capital and income return from the timber portfolio, typically provides the ideal investment return, with the harvesting allowing a small, stable cash yield to be paid out, and the biological growth of the timber providing a capital return.

A NCS related investment allows for a different level of risk, that provides the potential for upside as these markets and more importantly these revenue streams develop over the medium to long term. Carbon credits are generated at a greater rate in young, growing crops than older crops, hence diversification in respect of age class, can drive greater investment returns.

<sup>34</sup> The Portfolio for the Future by CAIA Association 2022



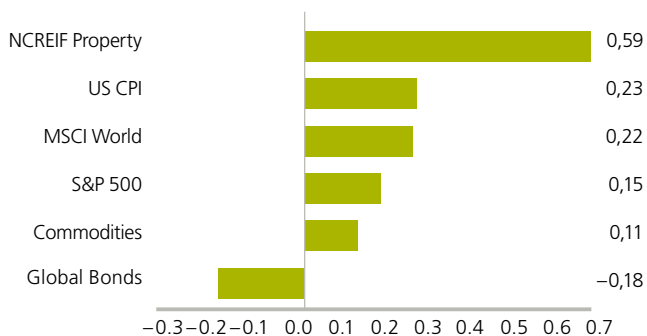
#### 4.2 Low Correlation, Inflation Protection

The low correlation to other asset classes and the historically proven protection against inflation make a timber investment an ideal portfolio addition in periods of volatile markets and inflation.

**Figure 4: NCREIF correlations with other asset classes<sup>35</sup>**

**Timberland returns have low correlations with financial assets**

Correlations with U.S. timberland, 2000 – 2021



Forests offer attractive investment characteristics for long-term investors. The combination of regular cash yields and the increasing value of forests, subject to an improving timber price, provides a positive environment for institutional investors.

Experienced investment managers will be able to optimise forest portfolios ecologically and economically to simultaneously deliver investment returns.

Afforestation, improved biodiversity, and the development of wind farms or solar parks on the property, allows additional returns to be captured through carbon credits and rental income.

Safety, stability, and predictability, combined with, in the context of climate change, the recognition of the unmatched ability of trees to sequester carbon dioxide from the atmosphere have justifiably led to a heightened investor interest in forestry investments as a unique asset class.



<sup>35</sup> Bloomberg (2022).

## 5. About Aquila Capital

Aquila Capital is focused on generating and managing essential assets on behalf of its clients. By investing in clean energy, timber and sustainable infrastructure assets, Aquila Capital contributes to the global energy transition and strengthens the world's infrastructure backbone.

Currently, Aquila Capital manages more than EUR 13 billion on behalf of institutional investors worldwide. Its primary objective is to generate performance for its clients by managing the complexity of these essential assets.

Today, the group manages wind energy, solar PV and hydropower assets of 11.1 GW capacity. Additionally, 1.7 million square metres of sustainable real estate and green logistics projects have been built or are under development. Aquila Capital also invests in energy efficiency projects, sustainable forestry, carbon and data centres.

Aquila Capital has been carbon neutral since 2006. Sustainability has always been part of Aquila Capital's value system and is an integral part of its investment strategies, processes and management. The company has around 630 employees from 48 nations, operating in 16 offices in 15 countries worldwide.

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### Authors



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*Investment Research Analyst*

It is with great sadness that we announce the death of Peter Schnellhammer, an Investment Research Analyst at Aquila Capital. Peter was instrumental in writing this White Paper and as a result, we dedicate it to his memory. Aquila Capital are hugely appreciative of Peter's dedication, intelligence and as a trusted colleague, we send many condolences to his family and friends. Peter had worked for more than 6 years in Strategic Research and Alternative Investments. Prior to joining Aquila Capital in 2019, Peter focused on macroeconomic research of Real Estate markets and completed a master's degree in Economics from the University of Rostock.



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Dr. Johannes Baare is responsible for overseeing the investment and asset management activities of Aquila Capital's Land Use & Carbon Forestry department, including determining its overall strategic direction and product origination. He has been working in the industry since 2015. Prior to joining Aquila Capital, he had been advising clients on all legal aspects of domestic and cross-border M&A transactions at two leading law firms.



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Edward Daniels is a Chartered Accountant and has over 12 years of experience of investing in commercial forestry and timber. Prior to joining Aquila Capital in May 2022, Edward was Head of Forestry at BNP Paribas, and prior to that an Investment Director at Gresham House, where he oversaw the management of three forestry and renewable energy funds.



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