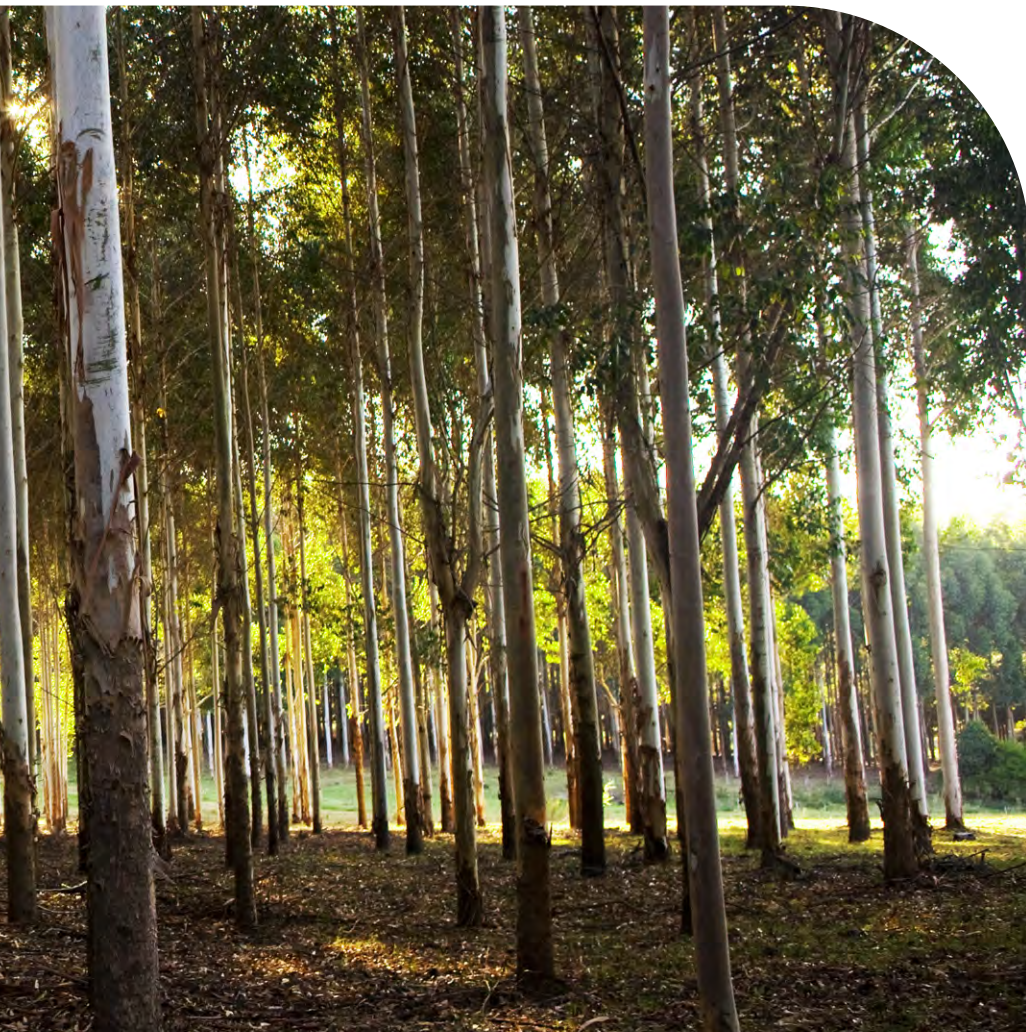




NET ZERO & LUMIN TRP

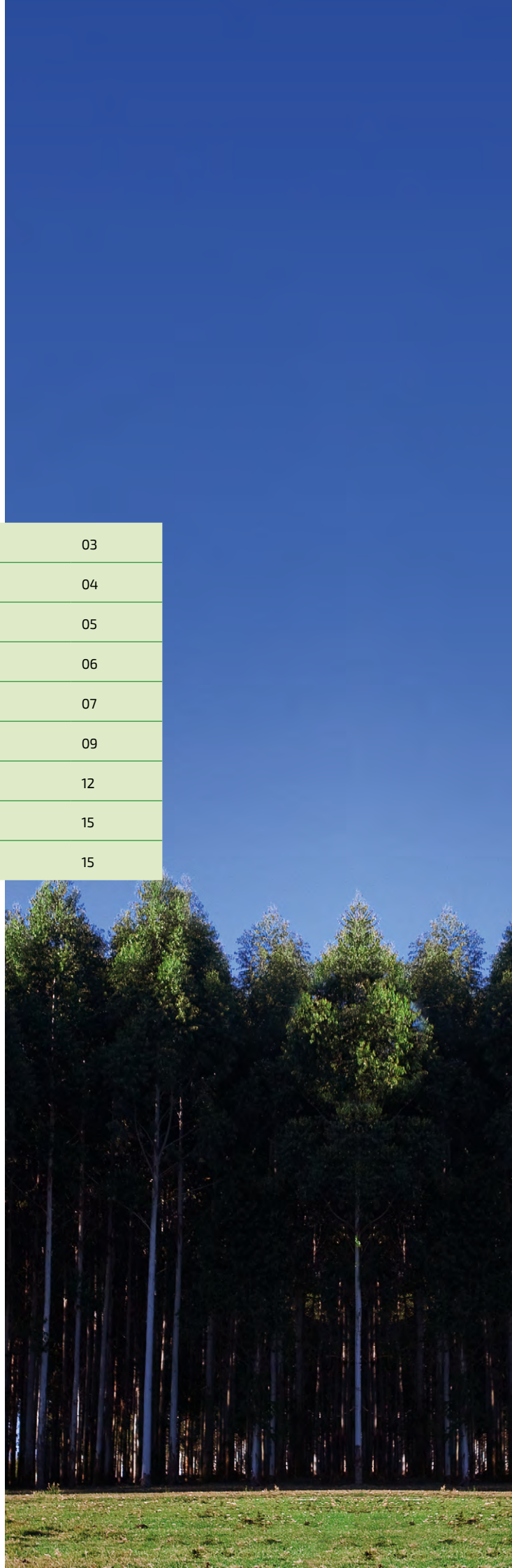
A tropical replacement panel
(plywood) & veneer



The mark of
responsible forestry

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EXECUTIVE SUMMARY

Climate change is one of the biggest challenges facing our world today, with carbon dioxide (CO₂) reduction synonymous with environmental safeguarding. While the past few decades have seen many attempts to control and reverse the impact of carbon emissions, net zero has now widely been adopted as the global strategy – and the race is on.

Where carbon sequestration is concerned, timberlands present a natural net zero solution. However, deforestation continues to sweep through tropical regions, at the same time as consumer demand increases for tropical species – leaving the timber industry with a real challenge.

After almost three decades of research, development, and innovation, we have developed an innovative way to be part of the solution... a high-quality Tropical Replacement Panel produced from sustainably managed timberlands.

LUMIN TRP is the product of a committed journey that has seen us nurture seedlings into mature forests, monitor the needs of global markets constantly, and invest in the development of forward-thinking solutions to meet future demand.

In this paper, we explore the role that LUMIN TRP can play in today's net zero agenda, and how it breaks new ground for plywood by giving specifiers and distributors access to a truly sustainable tropical replacement panel, from a truly sustainable source.

Alvaro Molinari, CEO, LUMIN



THE GLOBAL NET ZERO AGENDA

According to the Carbon Trust¹, net zero targets are announced almost daily, and the term is now synonymous with climate leadership.

In simple terms, net zero means to strike a balance between the amount of greenhouse gas emissions produced and the amount removed from the atmosphere. This can be achieved by the following working in tandem:

- Reducing existing emissions
- Actively removing greenhouse gases

Targets set by the Paris Agreement², which came into force in 2016, specify a limit to global warming to well below 2, preferably 1.5 degrees Celsius, compared to pre-industrial levels. To achieve this long-term temperature goal, countries aim to reach global peaking of greenhouse gas emissions as soon as possible to achieve a climate neutral world by mid-century. Virtually every country globally has now committed to this aim and to achieve these global warming targets, the goal is net zero by 2050³ - worldwide. In light of this, the United Nations highlight the need for adaptation and resilience measures, and the mobilisation of climate financing for developing countries.

Why 'net zero'?⁴

In many sectors of the economy, technologies exist that can bring emissions to zero. For example, with electricity generation, it can be done using renewable and nuclear generation. However, in other sectors (including agriculture and aviation), the technological options are more limited, and it is unlikely that emissions will be brought to zero.

Therefore, offsets (the opposite of emissions) in another area will likely be required to offset these with an equivalent amount of CO₂ needing to be taken out of the atmosphere. These practices or technologies are sometimes described as achieving "negative emissions" or "sinks". This means the target becomes 'net zero' for the economy as a whole. The term 'carbon neutrality' is also often used in this context.

How to create offsets?

The only greenhouse gas that can easily be absorbed from the atmosphere is CO₂. There are two basic approaches to extracting it: by stimulating nature to absorb more, and by building technology that does the job⁴. While technological advances continue to be made which will help to reduce emissions, the major requirement will be for carbon offset if global warming is to be limited.

Plants absorb CO₂ as they grow, through photosynthesis. Peatbogs, mangroves, soil, and even underground seaweed have existed for thousands of years, but attention in recent decades has turned to forests and carbon reduction – putting the spotlight on the wood products industry and the role it plays in meeting the needs of global economies.

Therefore, all other things being equal, having more plants growing, or having plants growing faster, will remove more CO₂ from the atmosphere. Two of the most effective approaches to create negative emissions (offsets) then, are afforestation – planting more forest – and reforestation – replacing forest that has been lost or thinned.

**TROPICAL TREE
COVER ALONE
CAN PROVIDE
23%
OF THE CLIMATE
MITIGATION
NEEDED OVER
THE NEXT
DECADE TO
MEET GOALS SET
IN THE PARIS
AGREEMENT.**

Source:
[www.nationalgeographic.com/environment/
article/deforestation](http://www.nationalgeographic.com/environment/article/deforestation)



NET ZERO AND THE WOOD PRODUCTS INDUSTRY

A naturally replenishable resource, wood has long been recognised as a sustainable material that services a wide range of applications.

However, it is in the construction industry where timber truly meets the net zero challenge. This is for two main reasons:

Carbon emissions

Construction activity generates high levels of emissions. The United Nations Environment Programme reported that the construction industry accounts for 38% of CO₂⁵. It is not surprising then, that countries are looking to this sector as a priority for carbon reduction. For example, the UK Government has set housebuilders an ambitious target of delivering new homes that are net zero by 2025⁶.

Another example is the Scandinavian initiative where cities like Oslo, Helsinki and Copenhagen are running pilot programs to switch all machinery used on site – excavators, diggers and loaders – to all electric⁷.

Embodied carbon

The crucial role that wood plays as an alternative material to concrete, steel and plastics is fast becoming evident⁸. This is because many building materials contain high levels of embodied carbon. When seeking to reach net zero, specifiers therefore turn to more natural products – such as wood and wood-based products.

While the case for reducing the use of construction products which have high levels of embodied carbon is clear, there are further considerations and implications regarding the wood products industry and net zero.

A TROPICAL TOPIC

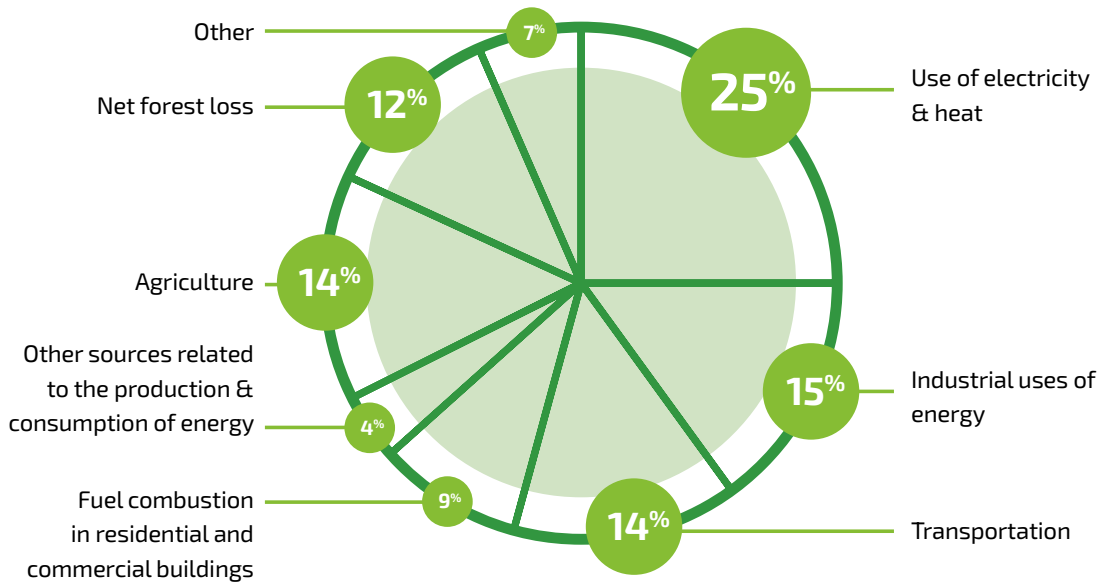
Tropical hardwoods have long been used globally in construction, offering an aesthetic and often structural specification – which in the past, has sometimes come at the expense of tropical forests.

While there have been some positive moves made against deforestation and illegal logging, globally tropical forests are continuing to be destroyed. This overall destruction of tropical forests is responsible for around 20% of global greenhouse gas emissions. Although commercial and non-sustainable wood extraction is estimated to be a very small percentage of this, concerns remain.

Greenhouse gas emissions, including CO₂ and methane (CH₄) from fossil fuel combustion, deforestation, and land-use change, are central causes of climate change. Specifically, deforestation and forest degradation, primarily due to expanded agricultural activity in tropical developing countries, are responsible for approximately 12% of global greenhouse gas emissions annually:

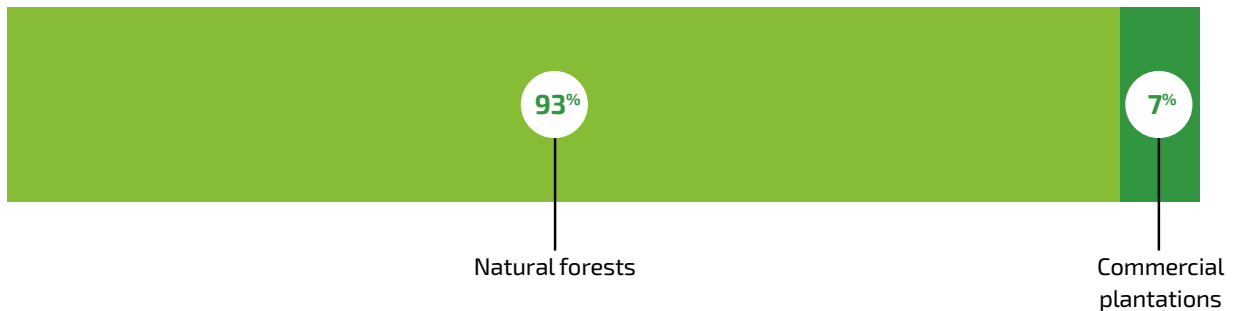
Primary causes of greenhouse gas emissions.

Sources: U.S. Congressional Budget Office; TIG Analysis



Global forest types

Sources: Food and Agriculture Organisation



BTG Pactual, 2019

CARBON SEQUESTRATION AND COMMERCIAL PLANTATIONS

Although using forests for carbon sequestration is a known path to reducing CO₂, the crucial role of wood products in helping limit global warming to 1.5°C by 2030 is only now becoming more evident. This is best demonstrated by an emerging land investment trend which focuses on forestry as a sought-after ESG-ready investment⁸.

Moreover, carbon sequestration is not only about preserving existing forestlands. Commercial plantations can be more effective at carbon sequestration than older, unmanaged natural forests. This is because trees with faster growth rates can absorb more carbon from the atmosphere than older, slower-growing trees. In unmanaged natural forests, growth rates tend to be slower because trees are typically older, and they face a high degree of competition for nutrients and sunlight, hindering their ability to sequester carbon as efficiently as commercial plantations⁹.

In contrast, commercial plantations are actively managed to promote the rapid growth of trees. As such, commercial plantations tend to be comprised of younger, healthier trees that are capable of sequestering more carbon than slower-growing natural forests. It is worth mentioning that even though unmanaged natural forests may continue to sequester carbon for a longer period of time (as they are not harvested), shorter-rotation commercial plantations have the potential to sequester a greater amount of carbon overall as standing timber is converted to long-lived wood products, such as lumber for housing and furniture, which keeps carbon sequestered for long periods of time¹⁰.

Despite the positive contribution commercial plantations can make to carbon sequestration, they only account for 7% of the world's forests.

THE COP26 CLIMATE SUMMIT IN GLASGOW, UK, SAW MORE THAN 100 WORLD LEADERS PROMISE TO END AND REVERSE DEFORESTATION BY 2030.

This comes after an earlier pledge in 2014, which saw deforestation subsequently increase.

Brazil, where stretches of the Amazon rainforest have been cut down, was among the COP26 signatories, with the pledge covering around 85% of the world's forests.

That said, the scale of the funding, and the key countries supporting the pledge, mean there are reasons to be more optimistic about hitting the 2030 target.

LUMIN: achieving carbon balance

In 2006, LUMIN started a project to specifically evaluate Green House Gases.

The initial project comprised a total of 18,191 HA of land in Uruguay previously under extensive grazing by cattle that was converted into forest plantations. This project is ongoing, and the goal is to produce long-lived timber products, resulting in the sequestering of carbon dioxide from the atmosphere in different pools, reversing the existing soil degradation process that has occurred over several years.

The results to date indicate that this will remove a total amount of 5,601,938 tCO₂, equivalent to the emissions of crude oil imported in Uruguay in one year.

UNDERSTANDING MARKET CHALLENGES

One of the biggest challenges facing the wood products industry is balancing supply with demand – and ensuring products come from a sustainable source.

Tropical species have traditionally been extremely popular in plywood production, but sustainable supply is becoming more and more difficult to secure.

The 2017 article by Michael Guindon, addresses this subject. Examining analysis from Global Canopy, he explores why certification has failed tropical forests¹¹:

'Given the low volumes of certified timber available from tropical forests, these companies have limited options for sourcing sustainable timber products from the tropics.

They must rely more heavily on certified timber from temperate and boreal forests in Europe and North America to meet their commitments, which does little to promote sustainable forest management in the tropics.'

'A large proportion of tropical timber is consumed in the countries where it is produced.

However, few companies operating in these regions have strong policies to source sustainable timber.'

Almost

430 million hectares

of forests, an area about half the size of Brazil, are currently certified under the two largest certification schemes, the Forest Stewardship Council® (FSC®) and the Programme for the Endorsement of Forest Certification (PEFC).

Yet, only 7% of certified forests, an area roughly the size of Italy, are located in tropical countries.

“We only have so much time left, a small window within which to make decisions that will avoid the worst consequences of the climate crisis.

Americans understand this is a crisis and we need to address it.”¹⁵

John Kerry
US Govt. Climate Envoy

LEGISLATIVE IMPACT

Governments around the world have strived to protect natural forests by introducing laws which make it a crime to trade in illegally sourced timber, which in turn drives trends in demand.

Europe – EUTR

The EU Timber Regulation (EUTR) came into force on 3rd March 2013, making it illegal to place unlawfully harvested timber and timber products on the EU market. The legislation affects all those that first place timber on the EU market as well as traders further down the supply chain. It is a crime to place illegal timber on EU markets and all organisations affected by the EUTR have to adopt appropriate practices to ensure that timber or timber products they trade and supply are legal, as a minimum.

According to the UK Timber Trade Federation, in 2019 plywood containing tropical wood accounted for over 70% of all imports to the UK from China. In 2020, this reduced to less than 50% of the total¹². When looking at the UK, overall, in 2020 the volume of plywood containing tropical species fell by 30%.

There are likely a few factors driving this trend, including lack of supply from tropical sources and more stringent enforcement of EUTR regulations.

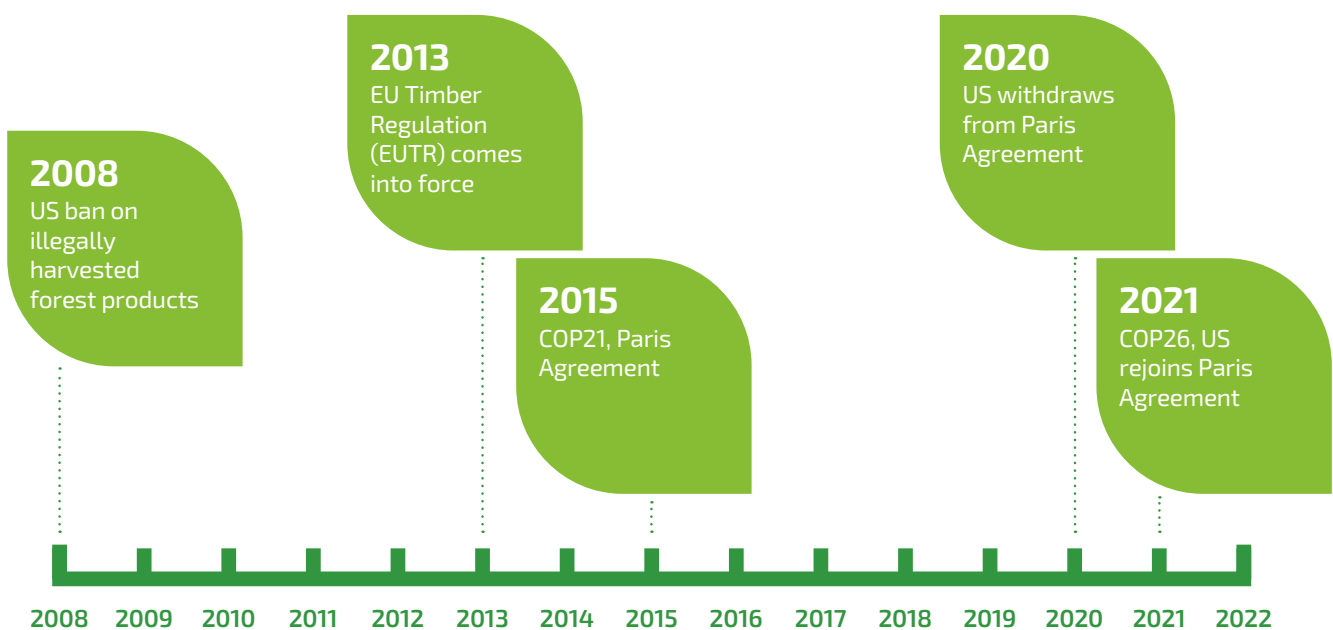
US – blanket ban

In May 2008, the US passed the world's most punitive and far reaching 'ban' on illegally harvested forest products, declaring the US would no longer traffic in 'illegally logged wood'. This landmark legislation was the world's first ban on trade of illegally sourced wood products, and it made the wood products supply chain responsible of complying with this ban. Failure to comply is a crime and a punishable offence.

That said, traditionally US consumers are generally focused on price and performance. While certification programs such as FSC are recognised by consumers, to date there has been a reluctance by some to pay a premium price for certified wood products. Nonetheless, there remains a desire for greater information about wood product sourcing whenever possible¹³.

However, in 2021 the US rejoined the Paris Agreement, and has set out an agenda to reduce emissions through a range of programmes and measures including nature-based solutions for ecosystems ranging from forests and agricultural soils to rivers and coasts¹⁴.

Domestic based solutions remain key, but it is likely that imported product will come under further scrutiny in the years ahead.



DEVELOPMENT OF A 21ST CENTURY SOLUTION

Based on the topics addressed so far in this paper, it is clear that carbon sequestration is key to achieving the global warming target limit of a 1.5 Celsius increase.

It can also be confidently asserted that the construction industry needs a sustainable and certified supply of wood products if it is to meet its net zero obligations.

Addressing these simultaneously, sustainably managed commercial plantations present an ideal solution – which is exactly what LUMIN (formerly the US company Weyerhaeuser) commenced to create in 1997.

Long before the Paris Agreement, LUMIN established Eucalyptus Grandis and Taeda Pine plantations in Uruguay to provide a long-term and sustainable supply of wood products.

Back then in Uruguay, there was just a small amount of native trees and the majority of the landmass was grasslands. The Uruguayan government decided to promote the development of forestry, passing a law that offered incentives for investment, which ultimately proved very successful. In the 30 years since then, plantations have gone from virtually nothing to over one million hectares.

Several factors contributed to this success in Uruguay including:

- Superior tree growth made possible due to the soils and climate of the designated forestry zone.
- A long-standing stable democracy with good socio-economic stability and a long history of respect for personal property rights.
- Positive governmental support and incentives for forestry projects and foreign investments.
- A well-educated population and an excellent skill base to support developing plantation forestry and wood products manufacturing which can be globally competitive.



3,000,000

Clonal seedling annual nursery capacity



65,000ha

Forest assets effectively planted



250,000m³

Plywood production per year



95%

Plywood panels are exported



200,000m³

Annual log exports



750

Direct jobs supported

WHY EUCALYPTUS GRANDIS?

Species planted over the years are primarily of *Eucalyptus Grandis* and *Taeda Pine*.

The silvicultural techniques engaged (including pruning and thinning) were designed specifically for the production of wood products (plywood and veneer) with a focus on creating clear grades. Detailed research and development focussed not only on the importance of growing this wood, but also crucially, development of a strong knowledge base of global end-user markets. This ensured that the resource can be processed into market accepted products and gain best access to global markets.

With much of this current forest estate reaching maturity over the past few years, the product strategy has been changing from primarily structural grades to more high-grade appearance panels.

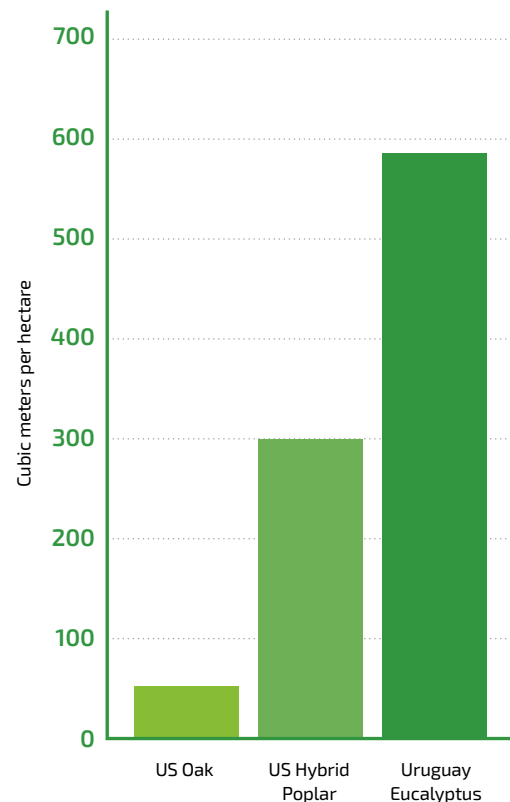
As the focus of pine faced panels move up the value-chain to AC/BC, it is with the versatile *Eucalyptus Grandis* hardwood (approx. 60% of the plantations going forward) that LUMIN has developed the foundation for a long term TRP (Tropical Replacement Panel) strategy.

With the very high growth rates for *Eucalyptus Grandis* that for example are over 11 times selected North American hardwood growth rates, combined with excellent technical qualities, this species has opened the door to the vast demand for alternatives to tropical wood products.



Eucalyptus Grandis can grow 3-4 metres in less than a year

Eucalyptus Grandis growth in 16 years compared with North American hardwoods



PRODUCT INNOVATION – LUMIN TRP

Over recent years, high-grade tropical supply from regions such as Malaysia, Indonesia and even China has reduced significantly or have disappeared in many cases, outlining the urgent need for long term sustainable sources.

Under development for over a decade, LUMIN TRP plywood panels directly address this challenge – giving the wood products industry access to a sustainable supply of product from a source which also makes a positive contribution to the net zero agenda.



WHAT IS LUMIN TRP?

LUMIN TRP is now being made possible by a major investment and by building a new manufacturing facility to produce 'thin peeled' veneer and plywood. The business realised that if it could increase its range of plywood to include thinner veneer/panels it could better take advantage of the clear top-grade material. Basically, it could produce more quality veneer from the same log, giving cost and product range benefits whilst addressing the environmental advantages.

The existing peeling operations focus on producing thicker 3.2-3.8mm veneers for the manufacturing of thicker plywood panels. These panels are based on 12mm, 15mm and 18mm thicknesses and are used in the construction industry, carpentry, transportation, and packaging.

The new line introduces new peeling technology capable to peel 1.3-1.5mm veneers. These thinner faces combined with the use of thicker veneers in the core optimize product configuration and help the business directly address the tropical replacement panel strategy that many clients globally are seeking. This new production line will produce panels from 5.5mm to 18mm, that will be targeted at specific end-user applications, such as fittings, furniture, high grade packaging, construction and mouldings.

Eucalyptus Grandis used to manufacture LUMIN TRP is a hardwood that looks and performs very similar to tropical species, and critically has forest and product certification to back up its strong credentials. This includes EN 13986 (CE2+), for use in construction and structural applications in Europe, certified by Element BV (Netherlands).

LUMIN TRP also complies with the E1 standard for emissions in Europe, adheres to the air quality standards required by the California Air Resource Board (CARB), and complies with the emission of formaldehyde required by the US EPA TSCA Title VI, as well as having FSC® forest certification for 100% of its plantations*.

The use of Eucalyptus Grandis results in TRP panels with a rich pink/red coloured wood that is sought after in many markets and is aesthetically similar to high end tropical species such as Meranti and Okoume. Combined with these beautiful aesthetics, LUMIN TRP compares well in technical properties and features to many of the popular tropical species. LUMIN TRP is therefore an ideal choice for builders and manufacturers looking for an environmentally friendly hardwood plywood, that is structurally and environmentally certified, with a beautiful appearance. LUMIN TRP will be a competitive and sustainable alternative for many end users of tropical "BB/CC" plywood.



*Forest Stewardship Council® standard, SGS-FM/COC-800037, (FSC-C162602); Chain of Custody certification, SGSCH-COC-006354 (FSC-C002169).



\$35,000,000

Investment to establish an additional production facility to specifically produce the new product line.



16

Number of years on average it takes on average for the Eucalyptus Grandis trees to mature.



100,000 m³

Volume of LUMIN TRP plywood product expected to be produced in next 3 years.



100,000 m³

Volume of additional LUMIN TRP veneer product expected to be produced in next 3 years.

TAKING LUMIN TRP TO MARKET

The new investment in manufacturing capabilities will feature an annual plywood production capacity of 34,000-36,000m³ of LUMIN TRP panels.

The main target destinations will be Europe and the US but there are many other global markets already also showing a keen interest. TRP will be launched with a rebranding plan to allow it to be placed on the market as an alternative to tropical panels.

In addition, this new investment will also produce an additional 34,000-36,000m³ of veneer for sale –with opportunities for sales being developed in Asia, Europe and the US.

Currently, LUMIN is utilising an equal volume of pine and eucalyptus logs for its manufacturing processes, but in the years ahead, larger volumes of this Eucalyptus Grandis will be harvested as this species reaches maturity. The properties of eucalyptus combined with excellent growth dynamics, and backed by a tropical replacement strategy, will ensure LUMIN has excellent potential to become a significant part of the net zero agenda over the next years and beyond.

To learn more about LUMIN TRP and how it can contribute to meeting sustainable construction targets and the net zero agenda, please visit: [LUMIN-TRP.com](https://www.LUMIN-TRP.com)



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The mark of responsible forestry



www.LUMIN-TRP.com

LUMIN is a global leader in socially responsible and environmentally sustainable wood products based in Uruguay.

Our business is inspired by the desire to guarantee a trustworthy supply of wood-products from responsible and sustainable sources delivered to our clients at national, regional, and global level. Our operations produce high quality, long lasting, beautiful and sustainable wood products that are externally certified to international standards. Today, LUMIN has over 750 personnel across timberlands, manufacturing and commercial teams.

LUMIN is owned by a consortium of long-term institutional investors:

TIG:

www.timberlandinvestmentgroup.com/

BCI:

www.BCI.CA

