

SetraNews

////////////////////// OCTOBER 2019

SETRA'S
WOOD SCHOOL

*Climate-
smart with
crosslam*

Scaling new heights in Hasselfors

THE MUNICIPALITIES
LEADING THE WAY
ON WOOD

PUTTING THE
FOREST IN
YOUR TANK

TALKING ABOUT TIMBER: *Potential and challenges of cross-laminated timber*

“THE SOLUTION TO THE CONSTRUCTION SECTOR’S LARGE CARBON FOOTPRINT IS HERE”



We are ready to build on a large scale – with a small footprint

IT HAS NEVER BEEN EASIER to build in wood. The latest technology for industrial construction in wood means that we now have a real, renewable alternative to steel and concrete. The solution to the construction sector’s large carbon footprint is here, just waiting to be used.

The wood construction industry has set itself a joint target that by 2025 we will account for 50% of apartment block construction in Sweden. Next year, Setra will be boosting its contribution to more sustainable construction with the launch of cross-laminated timber (crosslam) from our Långshyttan plant.

It is encouraging to see all the new wood projects being developed, both here in Sweden and around the world. We are also noticing that both the construction industry and clients are becoming increasingly used to working with our material in large-scale structures. You can read all about our survey of the municipalities leading the way on wood construction on pages 5–9. The article has many useful tips to share.

IT WAS ONLY NATURAL FOR SETRA to choose wood for the expansion of our sawmill in Hasselfors, which is gaining a new trim saw with integrated planing machine. On pages 11–13, you can find out more about the project, which is both bigger and taller than anything we have done before. The facility, which is being built with a glulam and crosslam frame, is a prime example of what can be done with wood using modern technology.

Do you want to know more about the benefits of crosslam from a sustainability perspective, and why it is better for the climate than concrete, for example? Head to our Wood School on pages 14–15, where we explain how the material is good for builders and the planet.

Enjoy the magazine!
Anders Nordmark, acting CEO, Setra

WOODPRINT PUTS WOOD CONSTRUCTION ON THE MAP

WITH GROWING interest in Sweden’s expanding and innovative wood construction, the Swedish Wood Building Council has developed the digital platform woodprintsweden.se, with a view to collating and showcasing wood construction in Sweden.

Woodprint is designed as a map showing which wood construction projects are being planned, designed and built, and which are already occupied and in use. The information will be published by developers, architects, suppliers and contractors, who enter details about their wood construction project in the database themselves.

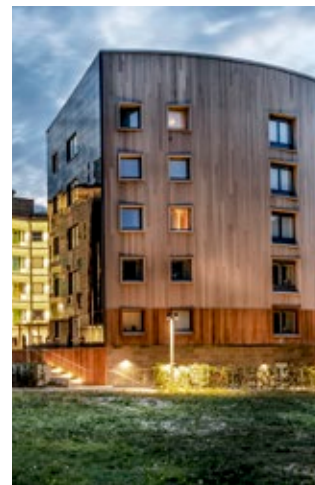


Photo: Patrik Ekenblom

The scent of wood

NORWEGIAN ARTIST Sissel Tolaas has spent a great deal of time exploring scents and perceptions of scent in her art. Now she has collected and interpreted scents from a tree’s journey through life – from forest to finished floorboards. She then presents the life of the tree in a concentrated fragrance that drips into a wooden bowl.



SETRANEWS is Setra’s customer magazine. It is published in Swedish and English for customers and other stakeholders in Sweden and abroad. The purpose of the magazine is to spread knowledge and inspiration about wood and construction.

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COVER PHOTO: Setra’s new trim saw with integrated planing machine in Hasselfors. Photo Johan Töpel.

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NEW FACES



New CEO for Setra

KATARINA LEVIN will become the new CEO of Setra in January 2020. Over her extensive career, Katarina has held numerous leading positions in the wood industry, the most recent of which was Vice President Market & Sales at SCA Wood.

"I feel honoured and privileged to be taking on this position. Setra is of huge importance to so many people, not least its employees, customers, forest owners and local communities. The future depends on renewable materials and I look forward to working with everyone at Setra to develop this area," says Katarina.



Head of Project Management

KURT ENGLUND is Head of Project Management for Setra's new venture into building solutions in cross-laminated timber. Kurt joined Setra last spring and works in Långshyttan. He was previously Chief Project Manager at window company Mockfjärds Fönsterentreprenad.



Sales Manager Building Solutions

CATE CARLBOM is Sales Manager for Building Solutions in crosslam and glulam, having joined Setra in August. Cate has extensive sales experience in construction and contracting, most recently from her role as Project Manager at Mockfjärds Fönsterentreprenad. She has also worked in sales and project management in the concrete industry.



Smart innovation in glulam

IT IS NOW EASIER than ever to realise the dream of your own glulam building. Setra has developed four different models of standard halls, designed around a glulam structural frame. The halls are sold in kit form.

"We're seeing a noticeable increase in demand for wood construction. Many people who want to order from us don't consider steel a viable alternative. What they want is the feel, acoustics, indoor climate and quality that comes from a true wooden structure," says

Setra's glulam specialist Thomas Kling.

The halls are designed to meet many different needs in the areas of agriculture, manufacturing and logistics, making them suitable for use as machine halls, stables or warehouses, for example. Thomas Kling believes that it will become increasingly common to buy glulam designs as complete kits.

If you have any questions about Setra's standard halls, get in touch with Thomas Kling: thomas.kling@setragroup.com

PINE ON THE MENU

SUSTAINABILITY IS BECOMING increasingly important to many interior architects and designers, which has fuelled a growing interest in materials with a small footprint. In spring 2019, second-year students on the Interior Architecture & Furniture Design programme at Konstfack University of Arts, Crafts and Design were tasked with creating pine furniture for restaurant and café environments. The brief was to showcase pine as a natural, sustainable and formable material for use in the furniture industry. Swedish Wood provided Swedish pine for the students to use in their designs.



WOOD GAINS GROUND DESPITE TOUGH TIMES

After a record period of economic buoyancy, the wood market is entering more challenging waters.

However, wood continues to gain market share from steel and concrete ever more widely across the globe.

We take a look at a changing construction industry. TEXT: LINN TREIJS

"ALTHOUGH WE'RE HEADING for a global recession, with many countries seeing a decline in new production, interest in cross-laminated timber remains incredibly strong," says Olle Berg, EVP, Market and Business Development at Setra.

Cross-laminated timber, crosslam, is taking business away from other materials in Europe, the USA, Australia and Asia, driven primarily by the sustainability profile of wood. However, another crucial factor is that construction methods have improved to meet the demand for high-rise construction in cities. The fact that crosslam is now seen as an established building material has also helped, as construction companies are beginning to have the courage to choose wood, based on experience from their budgeting on earlier projects.

Growing demand

So far, demand for crosslam has grown at the same pace as capacity. In Europe, volumes have increased from practically zero in the early 2000s to a current figure of 1.8 million cubic metres. Sweden has several factories on the starting blocks, with Setra's investment in Långshyttan a good example.

"This growing interest gives us great confidence, even during a downturn in the construction industry. Those who have set up factories recently have had no problem



The Carbon12 apartment block in Oregon alludes to wood's capacity for carbon capture and has turned heads in the USA with its crosslam structural frame.

filling their order books. In fact, the main issue has been getting the line to work and produce enough," says Olle Berg.

As a material, crosslam is primarily competing with concrete. Today's production capacity in Sweden amounts to around 10% of the capacity in the concrete industry, which is quite a realistic level, according to Olle Berg.

Growth in the east and west

The number of tall buildings in wood is rising quickly on the other side of the Atlantic and domestic production of crosslam in the USA is growing strongly – both in the east and west. Large wooden structures, which had previously been a small niche, are now spawning a broader industry. New rules permitting wood frames over as many as 18 storeys instead of the current limit of six will be introduced in 2021, offering a potential springboard for future development.

A similar trend is underway in China, although it has not come quite as far.

"The industry is really in its infancy. Crosslam has been on the market for around five years and, although interest in wood construction is growing, particularly for environmental reasons, progress is slow," says Flora Chen, Managing Director Setra China.

In China too, the authorities are in the process of reviewing the standards for wooden structures. The current limit is set at five storeys in wood, with a number of limitations.

"A typical tall building in China is 15–30 storeys high, so we have a long way to go yet. One of the main obstacles is to get the fire tests needed to change the rules. But I feel there is a growing awareness of the climate effects from construction, compared with just a year ago," comments Flora.

THREE WOOD TRENDS



Setra's EVP, Market and Business Development, Olle Berg examines the issues affecting the wood industry this autumn.

Unpredictable market situation

We are seeing a lower rate of growth in most countries, although wood consumption in Europe is fundamentally strong and housebuilding in the USA is growing steadily. Uncertainties such as Brexit and the trade war between the USA and China are also affecting many wood product companies and overall, it is

difficult to predict the future. It therefore makes sense to monitor the market with particular vigilance.

Surplus of spruce

Large parts of Central Europe and also southern Sweden have seen their spruces hit hard by insect pests that are thriving in the warmer weather. There is therefore now a surplus of spruce

timber on the market, and it may be well into next year before the situation balances out.

Prepare for Brexit

Whether the UK's exit from the EU is hard or soft, it pays to be prepared. Work out how different scenarios will affect you and get action plans, permits and documentation in place, as much as you can.

Growing interest for wood in Sweden's municipalities

Swedish municipalities' enthusiasm for wood construction is growing. But what are the challenges along the way? And what are industry organisations and other actors doing to ease the path of municipalities looking to build in wood? Setra News checks in with a sector that's buzzing with energy. →

TEXT: ANNA MATZINGER

Photo: Fredrik Gerlach

Municipality:
KARLSTAD

Lotsen preschool is the first building in Karlstad to have a solid wood frame. The school's facade and interior surfaces are also finished in wood.

Architect: Sweco



THERE'S A PRESCHOOL in Karlstad and apartment blocks for young adults in Alingsås, an old people's home in Stockholm and the biggest wooden office block in Sweden in Uppsala. Skellefteå's new arts centre is being made from wood and the City of Malmö has adopted a local roadmap in which building in wood will be a given.

So even if there are no statistics on how much Sweden's municipalities are investing in building in wood, one thing is clear – there is a lot of interest and it's growing.

Jessica Becker is Project Coordinator at Wood City Sweden, an organisation that has emerged from an assignment given by the government to Västerbotten County Administrative Board in 2013. The politicians wanted more municipalities to build in wood to attain Sweden's national climate objectives. Jessica is a trained architect and has long experience in industrial manufacturing of buildings made from wood.

"The biggest difference now is that we are talking about wood as a building material from a climate perspective. This wasn't the case at all ten years ago," she says.

Wood construction increasing as expertise grows

Since 1994, when the law was changed to allow the construction of wood-framed buildings more than two storeys high, the industry's expertise in wood construction has grown. But progress has been slow and has only properly taken off in the last few years.

"Building in wood was an unfamiliar prospect in the construction industry, and it caused a certain amount of fear. People tend to stick to materials they feel comfortable with, and that goes for everyone from architects and structural engineers to construction companies. We have also been going through a long economic upturn in which demand for housing



Jessica Becker is Project Coordinator at Wood City Sweden.

“Building in wood is the answer to many current issues, from the climate challenges to increasing urban density”

SUSANNE RUDENSTAM, SWEDISH WOOD BUILDING COUNCIL



Illustration: White Arkitekter

Kulturhus Sara unifies Skellefteå's heritage of building in wood with the latest engineering technologies, making the project a pioneer in sustainable design and construction. Architect: White Arkitekter

especially has been very high. This hasn't exactly encouraged actors to slow down and try out new ideas," Jessica Becker points out.

Another problem that has been resolved in recent years is that it has been difficult to make building in wood competitive. Developers who don't have enough expertise in this area have often allowed an excessive margin for risks, making the cost of many procurement projects unfeasibly high.

"This has improved as the level of knowledge has increased. Today lots of procurement projects show that industrially produced buildings made from wood often work out cheaper than buildings made from concrete," says Jessica Becker.

For the municipalities, however, one of the biggest obstacles to building more in wood has been making it happen. The rules on the requirements that can be set in procurement projects can be a jungle, and authorities are uncertain how much scope they have to specifically demand the use of wood.

One way of steering what is built in the municipalities is to set criteria that are not just about price, when allocating land for development. But here too, politicians and civil servants are not sure what the rules are. What are we allowed to do? What requirements can we set?

"These were questions that often came up when we were going round the country talking to municipalities. That's why we've produced 'Wood First', which offers support for municipalities looking for help in producing a wood construction strategy, for example. It's going to be tested in a number of pilot municipalities this autumn," says Jessica Becker.

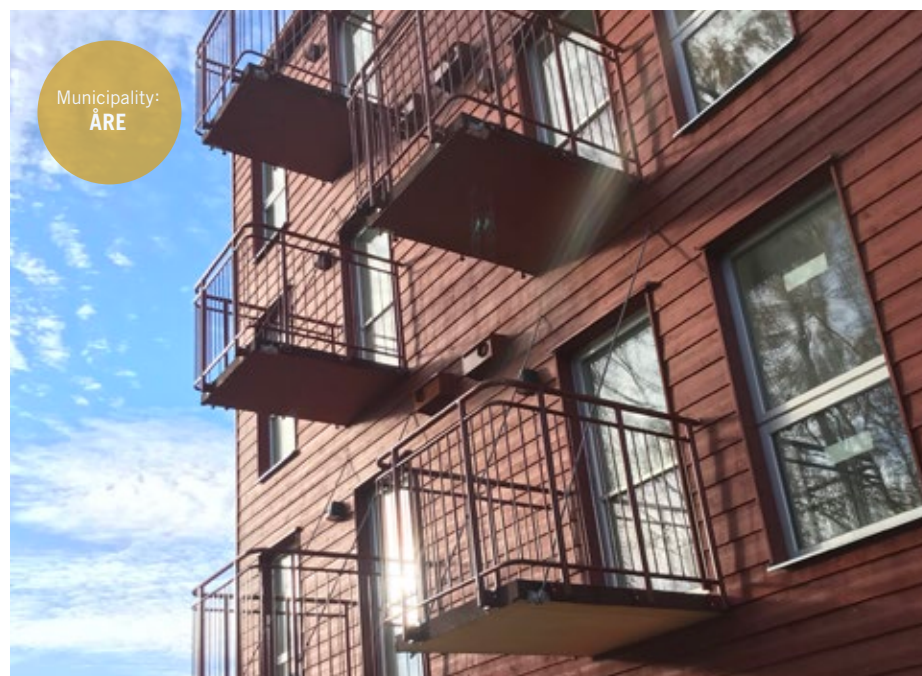
The consultancy WSP, Linköping University, the Swedish government research institute RISE and the Swedish Association of Local Authorities and Regions have been involved in work to support the municipalities.

Tradition of building in wood in Skellefteå

Skellefteå municipality has been building in wood since the 1990s. Last year a whole new secondary school was opened, with an adjoining sports hall, and 80% of the structure was wood. At the moment the new arts centre Kulturhus Sara (named after author Sara Lidman) is being built. Set for completion in 2021, it too is entirely in wood. In total there are about fifty reference projects in the municipality

"Industrially produced buildings made from wood often work out cheaper than buildings made from concrete"

JESSICA BECKER, WOOD CITY SWEDEN



Developer Årehus wants the Trägården project to boost the municipality's green and sustainable brand.

Architect: Aix Arkitekter

which are entirely or partially wood.

"Because we have the raw material on our doorstep, we have been building in wood for decades. The municipality has had a wood construction strategy since 2014 and the most recent version will be updated in 2020," says Evelina Fahleson, Chair of Skellefteå's Construction and Environment Committee.

The municipality works closely with the university, research institutes and other actors in the sector. This makes the investment in building in wood mutually beneficial; the institutions share their expertise and the municipality makes sure it can be tried out in practice. And the wood industry is also helping to boost employment.

"The forest industry has always been important up here. But gradually the climate issue has come into sharper focus. At the moment, work is in progress on an environment and climate programme which will tie the municipality's work on sustainability together. It will also cover economic and social aspects of sustainability," says Britt-Inger Olofsson, Development Strategist in Skellefteå.



Evelina Fahleson chairs the Construction and Environment Committee in Skellefteå.



The lightness of wood has made it possible to add several floors of offices on top of Trikäfabriken, an old brick building in Hammarby Sjöstad.
Architect: Tengbom

Every year the municipality receives a lot of inquiries for study visits and talks. They also arrange knowledge days on different themes of sustainable urban development. And they are receiving ever increasing demands to share the experience available.

“Next month we have been invited to give a talk at the Swedish Consulate General in St Petersburg. Many municipalities see increased building in wood as a way of attaining the climate objectives, and now the ones that are only at the early stages no longer need to reinvent the wheel. There is a lot of information and experience available, which will make the switch easier,” says Britt-Inger Olofsson.

Malmö to be climate neutral by 2030

There is also a focus on wood construction down at the other end of the country, in Malmö. But here the process is different.

The city is aiming to be the climate-smartest city in Sweden and in 2009 local politicians adopted an environmental programme in which the first aim is a climate neutral organisation by 2020. By 2030 the whole of Malmö will run on renewable energy. In 2018 they decided that the goals would be hard to achieve unless efforts included the construction sector.

“When we analysed the overall situation, we realised that the construction

sector accounts for 20-25% of Malmö’s climate burden. If we didn’t have the construction sector on side, we’d never be able to reach our climate objectives, no matter how hard we worked. Construction run by the city itself naturally also has to be adapted to the climate targets,” says

Josephine Nellerup, Urban Development Strategist at the City of Malmö.

In autumn 2018 a working group was tasked with carrying out a preliminary study on how the city could work to attain climate-neutral construction. The group’s work included looking at how develop-



In Hagastaden, a new district of Stockholm, work has begun on the world’s biggest wooden housing project in an inner city setting.
Architect: General Architecture

“There are lots of municipalities like ours that see more wood construction as a way of attaining the climate objectives”

BRITT-INGER OLOFSSON, SKELLEFTEÅ MUNICIPALITY

ment could be steered by the city itself and by the requirements it set. They quickly found that the best odds of achieving a genuine climate transition would come from the changes being driven by the construction sector itself.

“The group asked a number of construction industry players operating in Malmö: ‘Will it be possible to achieve climate neutrality by 2030?’ We were expecting to encounter a certain amount of scepticism, but the meeting ended with a ringing: ‘Let’s do it!’,” says Josephine Nellerup.

Based on the national roadmap for the construction sector, a joint steering document was produced and spring was dedicated to fine-tuning the ideas with about a hundred actors in the construction industry. In May this year the local roadmap was launched with the aim of making the city’s construction industry climate neutral by 2030, and climate positive by 2035.

Josephine is certain that the local roadmap will mean more wood construction. But how much more is impossible to say, because every project will be climate maximised as far as circumstances allow.

“It’s about questioning the materials used in every single building project and asking whether you couldn’t replace them with a more climate-smart solution instead. If we want to increase urban density, wood is probably the optimum alternative, because it is fast to build with, if you use prefab, and means less transport,” says Josephine Nellerup.

Increased interest also in Europe

If you look across Europe, there is greater interest in building housing and public buildings in wood there too – to a varying extent.

“We’re seeing lots of cities and regions coming on board with building in wood, for example, by producing wood construction strategies. The other day I had a conversation with representatives from the state of Baden-Württemberg in Germany, who wanted to come to Sweden to learn more. There’s growing interest in countries such as Spain and Portugal too, although they have less of a wood build-



Sweden’s largest development of high-rise apartments with a wood frame is emerging in Frostaliden, Skövde. Architect: White Arkitekter

ing tradition to draw on,” says Susanne Rudenstam, Head of the Swedish Wood Building Council in Stockholm.

The climate issue is a strong driving force out in Europe too. But for many cities it’s also about the fact that wood, and prefabrication, offers many advantages for building in urban environments.

“In recent years, the wood industry has made great progress in industrialisation and digitalisation. This has completely changed the playing field for prefabricated construction, which is a major advantage when building in cities. Partly because the construction process is quicker, with a short build time and considerably less disruption in the form of noise, dust and big cranes, and partly because it takes fewer man-hours. Both these factors weigh heavily when government agencies and private actors are choosing materials,” says Susanne Rudenstam.

Since the spring, the Swedish Forest Industries Federation has had a representative on the spot in Brussels. The idea is to run seminars, workshops and other events to spread information and expertise to Members of the European Parliament, which they can take with them to their respective countries. A great deal of work is also in progress on standardisation in the industry, all to facilitate construction



Josephine Nellerup is Urban Planning Strategist at the City of Malmö.

that works in the same way across the whole of Europe.

“Building in wood is the answer to many current issues, from the climate challenges to increasing urban density. But perhaps the most important thing is that it’s an option that is available now, and all we have to do is use it. And if there’s one thing that more and more actors are becoming aware of, it’s that when it comes to the climate, we have to turn this ship around now. There’s no time to lose,” says Susanne Rudenstam.

TREES IN YOUR TANK

Waste products from the forest are transforming the fuel industry. And demand just keeps on growing – as does the forest itself. This autumn the first ground will be broken at Setra and Preem's factory, which will link the forest to your car.

TEXT: LINN TREIJS

“WHAT’S UNIQUE about the project is the way it links the whole chain together. We use the energy in the sawdust on site at the sawmill,” says Pontus Friberg, who is heading the work from the Setra side.

The project is run by the company Pyrocell, which is jointly owned by Setra and fuel company Preem. The factory is being built next to Setra's Kastet sawmill in Gävle and revolves around a process known as pyrolysis. When the sawdust is rapidly heated to a high temperature, the solid material is vaporised and can be condensed into a liquid, bio-oil. Preem refines the oil to make a biofuel which replaces part of the fossil raw material in ordinary petrol and diesel, directly helping to reduce emissions on our roads.

“We’ve been looking for a way of increasing our climate benefit and the value of our sawdust for a long time and now we’ve found it. Pyrocell is meeting the huge demand for green products, while also reducing emissions

of carbon dioxide to the atmosphere,” says Pontus Friberg.

Greatest benefit on the roads

Today sawdust is used for district heating and for pellets. But it produces the greatest benefit for the climate as a raw material for biofuel – a product that is in short supply in Sweden. 85% of all Sweden's biofuel is imported, while the proportion of fossil fuel needs to be cut hugely in the years ahead.

According to Preem and Setra's calculations, when the bio-oil replaces fossil oil in manufacturing petrol and diesel, it will cut emissions by 80-90%. About 25,000 tonnes of oil will be produced each year, equivalent to the annual consumption of 15-20,000 cars.

When will Pyrocell's oil reach the pumps?

“We estimate starting production in 2021. We see major potential for more plants in the next few years as the demand for biofuel is so high,” says Pontus Friberg.

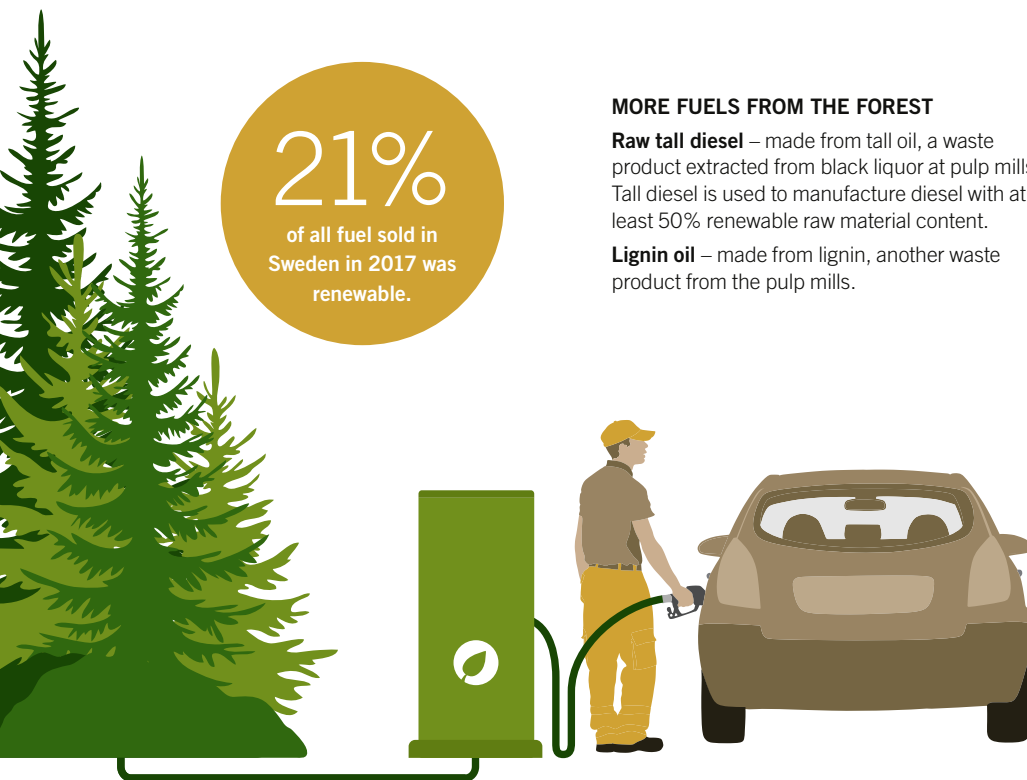
MORE FUELS FROM THE FOREST

Raw tall diesel – made from tall oil, a waste product extracted from black liquor at pulp mills. Tall diesel is used to manufacture diesel with at least 50% renewable raw material content.

Lignin oil – made from lignin, another waste product from the pulp mills.

21%

of all fuel sold in Sweden in 2017 was renewable.



➤ **HOW DOES IT WORK?** At setragroup.com/pyrocell you can learn how sawdust is turned into fuel.

PREEM:

Partnership a milestone

Preem CEO **Petter Holland** is eager to play a part in leading the development of renewable fuels and thinks the solution lies in forest raw materials.

What potential do you see in pyrolysis oil as a fuel?

Ever since Preem started producing renewable fuel, we've recognised the particularly high potential of waste products from the forest. Tall oil was the first product, but we see huge opportunities in processing more types of bio-based raw materials into renewable diesel and petrol. The partnership with Setra is a milestone and an important part of Preem's investment in renewables. Working together will enable us to create completely new value chains that will help to eventually phase out fossil transport fuel in favour of renewable fuels.

What is Preem's goal for renewable fuel?

Preem has a vision of leading the transition to a sustainable society. Our biggest investment in this regard is in increasing our focus on renewable fuel. We are currently planning to open a new plant in Gothenburg in 2024, which will produce a million cubic metres of renewable diesel and aviation fuel. The aim is to be producing five million cubic metres by 2040. Increased investment in renewable fuel means we will be able to help cut climate emissions by millions of tonnes a year.

What challenges do you see in getting there?

Sweden has unique opportunities to be the best in the world at renewable fuel, but it is taking a long time to develop the production of the raw materials. The new rules put in place last summer clearly require a reduction in the carbon content of fuel, which is a good sign. However, domestic production of renewable fuels is lagging behind. Unfortunately, the reason for this is legislation that currently favours the import of cheaper renewable fuels offering less climate benefit. This is despite the fact that we have huge potential for producing a Swedish product.



Setra Hasselfors takes glulam to new heights

At Setra's plant in Hasselfors, work on building a new trim saw with integrated planing machine is now under way. This investment will enable Setra to deliver value-added products to old and new markets. The building itself is an excellent example of Setra's capacity to deliver complex structural frames in glulam. TEXT: KATARINA BRANDT PHOTO: JOHAN TÖPEL





The glulam frame for the new facility in Hasselfors is Setra Långshyttan's biggest project so far.

THE MILL TOWN OF HASSELFORS, just under 60 km west of Örebro, is home to Setra's largest spruce sawmill, with a history that dates back over a century. In 1908, work began on building a much larger sawmill than the modest operation that went before. At the time, the company invested in frames, an edger, a steam-powered rip saw and panel saw and a timber yard, coming in at a total cost of SEK 75,000.

The investment being made today, 111 years later, has a rather different price tag. The new trimming and planing line currently being built in Hasselfors is budgeted at over SEK 300 million. The idea is that the line will deliver major efficiency gains and increase Setra's proportion of processed products in response to growing demand in the global construction market. Once the new facility is up and running, Setra expects Hasselfors to be manufacturing 345,000 cubic metres of wood products. Planned products will make up around two thirds of overall production.

"It's fantastic to be involved in delivering one of the biggest investments ever made by Setra. It means we'll be able to expand and enhance our product portfolio and better meet our customers' wishes,"

explains Jonas Fintling, Mill Manager at Setra Hasselfors.

A reference building for advanced use of glulam

No-one passing through Hasselfors can fail to notice the major structure that will



Mikael Norén, Site Manager for OBK Sverige AB, with Setra's glulam Product Specialist Thomas Kling.

house the new trim saw with integrated planing machine. The enormous industrial building will be 132 metres long and supported by a frame comprising 51 glulam posts, each 28.5 metres tall, and glulam roof beams. The roof itself will be made from cross-laminated timber elements, which will help to stabilise the building. Initially, the idea was that the frame of the new facility would be concrete. Following internal discussions, a new path was chosen that now seems like the obvious solution – giving the job to Setra's own glulam factory in Långshyttan.

"Naturally, it feels great to be using glulam for our new facility, seeing as we have the material available within the Group. It's going to be an excellent reference building for the advanced use of glulam. I can also report that the wood used for the posts was sawn here in Hasselfors, before being turned into glulam posts in Långshyttan," states Jonas Fintling.

The excavation work began in early 2019, and work on casting the foundations commenced in February. The first beams were raised in early June and rapid progress was made over the summer.

"Erection of the frame has rolled along nicely, except for a few stormy days in

July, when wind brought the work to a halt. By constructing the frame piece by piece and laying the crosslam roof at the same time, we were able to work without any interruptions to production,” recalls Mikael Norén, who is the Site Manager for the building contractor OBK Sverige.

The machine assembly work began in September and will continue while the walls in lightweight concrete are put into place around the whole building.

Setra's biggest glulam project so far

The project has thrown up a number of challenges, not least because this is the first time Setra Långshyttan has produced posts longer than 21 metres. The solution was to join six glulam beams, which were screwed and glued together manually using 400 screws.

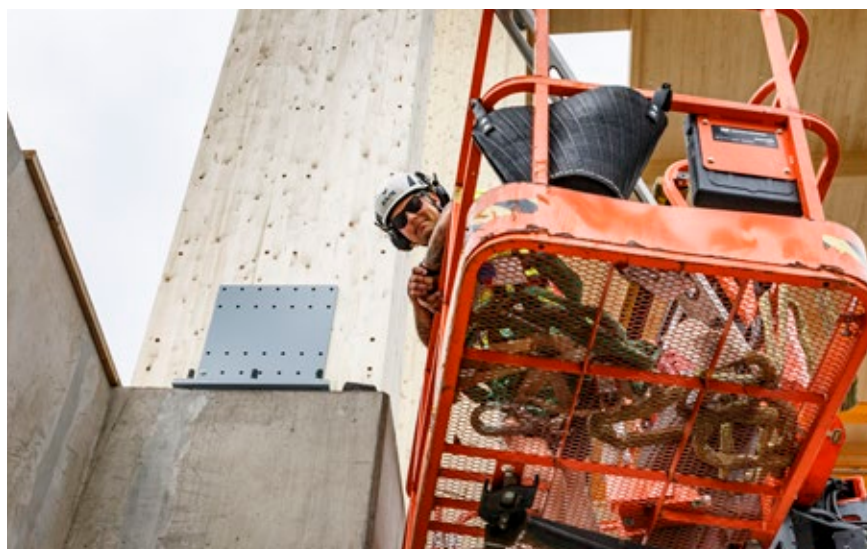
“The glulam frame for the new facility in Hasselfors is by far the biggest project we’ve ever done. It demonstrates that we are ready to take our place in a larger market with more advanced assignments than the small and medium-sized projects we’ve worked on previously,” says Thomas Kling, glulam product specialist at Setra.

The new building for the trimming and planing line was designed by Limträteknik in Falun. Its 11 employees specialise in wooden structures and are Setra’s partners in the planning and technical development of cross-laminated timber.

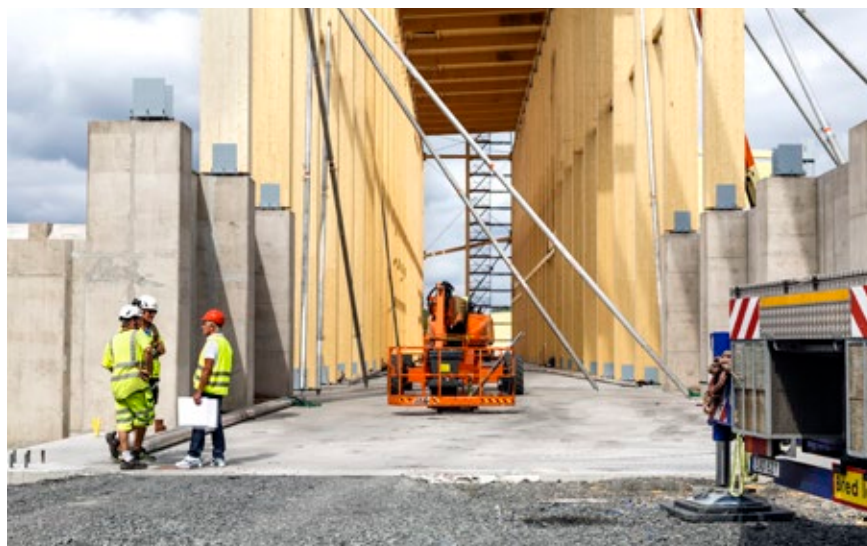
“As always when it comes to this type of building, we’ve had to adapt the design to the layout of the machinery and the production line. This is definitely an exciting project, with no simple, off-the-shelf solution. We’ve had to come up with many custom fixings and connectors, for example,” says Magnus Emilsson, structural engineer and CEO of Limträteknik.

Some of the installers on site in Hasselfors have limited experience of erecting a glulam frame. For them, working with the material has proven a positive surprise.

“Wood is easier to work with than steel and concrete. It’s simpler to shape and also to work on and handle on the construction site. Making adjustments is a piece of cake, so working with wood is great,” says Håkan Halvarsson, one of the construction workers from subcontractor Wermlands Mekaniska.



Many of the fixings and connectors used in the structure are specially designed.



Although the design is complex, the process of assembling the glulam frame has proven a pleasant surprise for the workforce.



«This is definitely an exciting project, with no simple, off-the-shelf solution»

This is the first time the glulam team in Setra Långshyttan has made posts longer than 21 metres.

WOOD SCHOOL

Sustainable and climate-smart with crosslam

Cross-laminated timber, crosslam, is a climate-smart material, made from renewable raw material, that is manufactured in an energy-efficient process and stores carbon dioxide throughout its lifetime. But there are other reasons why crosslam is a sustainable choice. We take a closer look in Setra's Wood School.

TEXT: KATARINA BRANDT

AS ALWAYS when we're talking about wood, the origin of the raw material is really important. The Swedish Forestry Act is based on getting as high a yield from the forest as possible while preserving biodiversity. At least two new trees are planted for every tree that is felled and growth is higher than the amount harvested, which means there is more forest in Sweden year on year. The fact that this raw material that eventually ends up in our homes comes from responsibly managed forests is vital to the sustainability of construction in wood.

The structure of crosslam is as simple

as it is ingenious. The prefabricated solid panels are made up of planed timber that is glued together in alternating layers for increased dimensional stability. The result is a structural component that is both strong and stiff in relation to its low weight.

The entire log is used

When the timber reaches the sawmill, it is sawn, kilned and graded before it is ready for the crosslam factory. There the wood is planed, cut, finger-jointed and glued to create solid wood elements. The bark, sawdust and wood chips generated

along the way aren't wasted either. They are important raw materials used in the paper and pulp industry and as renewable energy. Another advantage in manufacturing crosslam is that the strength and the quality sits in the finished elements, not simply in the raw material. This means that grades not traditionally considered good enough for making solid wood products can be used in this context and gain a higher value in this process.

Fewer journeys with lighter loads

The prefabricated elements are transported to the construction site by road. One

“Wooden buildings always produce better results than buildings made from other materials”

MARTIN ERLANDSSON is a Business Developer at IVL Swedish Environmental Research Institute, where he works to develop products and services, mainly digitalising environmental assessments. Besides looking at different types of environmental performance, he has also been involved in calculating the climate impacts of buildings depending on the choice of material.

From a climate perspective, how well does cross-laminated timber stand up compared with other materials?

“Wood for construction purposes is competitive as the material has a low climate impact compared with other alternatives. But the climate impact of other materials can be reduced significantly with a bit of effort. When you factor in the

climate impact of a building's construction solution, wooden buildings always produce better results than buildings made from other materials. It doesn't matter very much whether you use lightweight construction techniques, modular units or crosslam.”

Could the material be made even better?

“It has a lot to do with looking at the fuel used in forestry, when transporting the timber from the forest and in the sawmill. A switch to biodiesel could lower the climate impact and so could looking at developing renewable glue instead of fossil-based versions. Short distances are also important, that is to manufacture close to the construction site.”



What do you think is the most interesting aspect about crosslam?

“The way that solid wood elements are used to build even more biogenic carbon into the buildings. Unfortunately, we have no way of assessing the temporary carbon sink, but it is clearly a huge plus which we are not including in assessments of wood products, which is a great pity.”

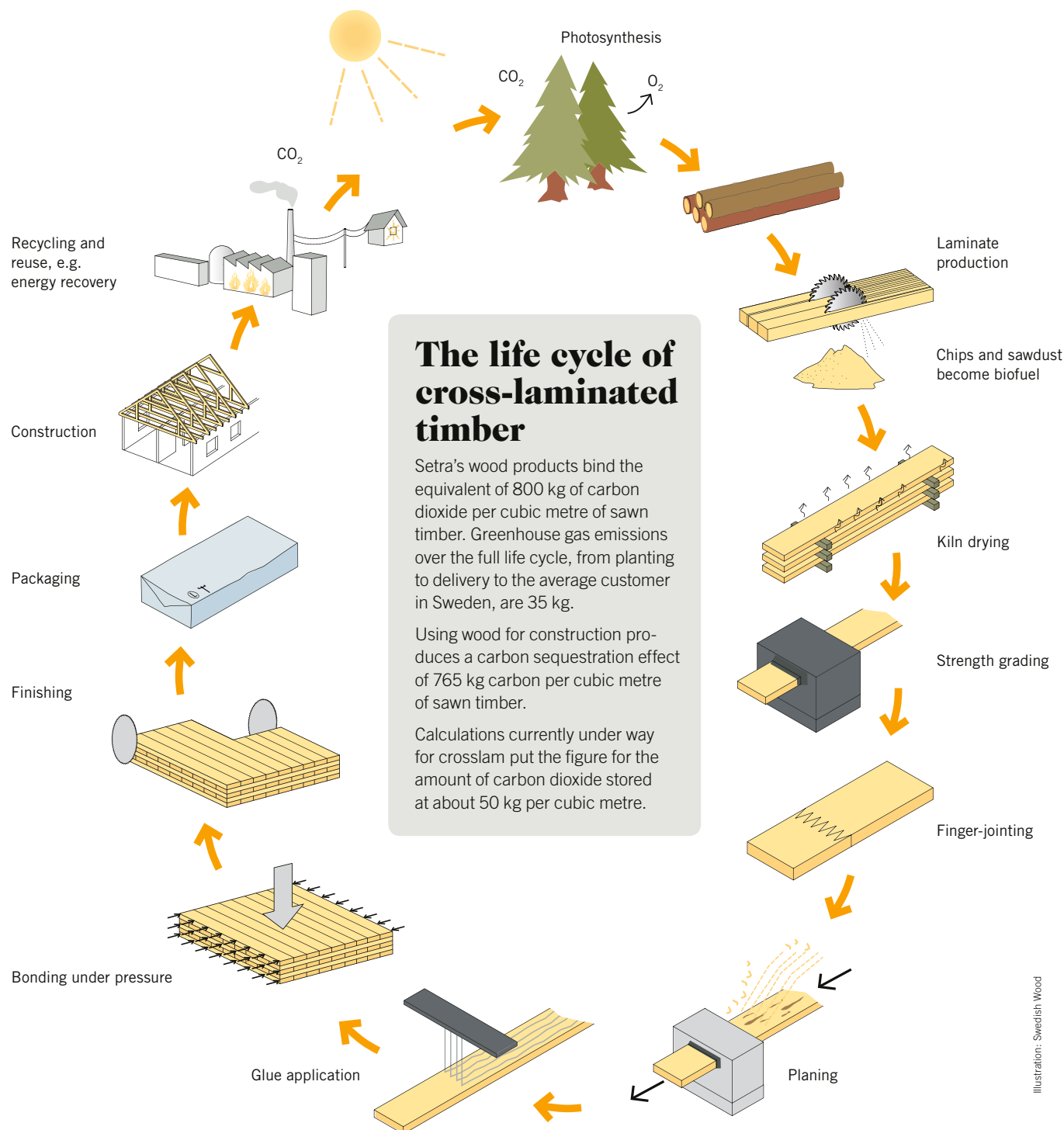


Illustration: Swedish Wood

advantage of the low weight of crosslam is that it needs fewer journeys and makes for a lighter load compared with building in concrete, for example. The low weight also opens up new opportunities, for example adding new floors to an existing building without needing to reinforce the foundations.

Shorter construction times and less waste

Because much of the work can be done in advance in the factory, work at the construction site goes quickly, involves

fewer phases and produces less waste. While concrete must dry before construction can continue, a building made from crosslam can be assembled floor by floor. This also makes a big difference to construction times. In addition, building with crosslam makes for a better working environment on the construction site because workers stay warm and dry, there is no dust or noise, and it is easier to work with than steel and concrete. This also means that construction causes less disruption to the local community and for a shorter time.

Wood can be recycled and reused

If a wooden building is to be good for the climate, it needs to stay standing for a long time as well. This is why it is important that all the steps in the construction process support the quality of the building, so that it is appreciated by its users and fulfils its function for as long as possible. In the final phase of the building's lifetime, the wood can be recycled and used again. It can be reused in new structures or transformed into energy through incineration, replacing fossil fuels. Incineration releases the carbon that was stored in the wood.

TALKING ABOUT TIMBER

In cross-laminated timber, the construction world has gained a new material for architecture and urban development – one that offers a real alternative to stone, brick, steel and concrete. Here, three architects talk about their views on crosslam and what opportunities and challenges lie ahead for the material.

TEXT: KATARINA BRANDT

What do architects think about crosslam?



OLA MALM
ARCHITECT, ARKITEKTBOLAGET

“The material’s ability to replace concrete in many contexts is a major plus”

I can see huge opportunities for cross-laminated timber. I really believe the material can help to advance the way we build. It’s a great material that we’ve been using a lot in our projects for a long time now. The most recent example was an office block, where we combined crosslam with glulam and created an interior with plenty of exposed wood. The material’s ability to replace concrete in many contexts is a major plus. Crosslam is extremely formable and can be worked on under cover in a factory, plus wood creates a good indoor climate, as it absorbs moisture.

I’m definitely a convert, but there are certainly things that need to be improved. The main issues are about how you handle the material on the building site, how you join it all together, and then there’s the matter of acoustics and floor structures, which need a better solution. Another challenge is coming up with solutions that allow you to expose the surface internally and make it a finished surface layer. Wood is beautiful, and embracing that avoids the added work of plastering the walls.



KARIN LÖFGEN
ARCHITECT AND WOOD CONSTRUCTION STRATEGIST, AIX ARKITEKTER

“The speed of building in crosslam is clearly one of the material’s benefits”

Searching on cross-laminated timber will often lead you to modular building and industrial construction. What the client therefore sees is a material that can deliver something really quickly and cheaply at the press of a button. The speed of building in crosslam is clearly one of the material’s benefits. But the shorter production time requires planning, and not just of the building, but also urban planning.

If you can coordinate the use of crosslam with a combination of design and industrial construction methods, it can help create a building that is perfectly suited to its purpose. I see crosslam opening up new opportunities, not least for the construction of community buildings. In some cases, it can be beneficial to bring together sports buildings, housing, offices and sheltered housing, for example. This will have to happen as the pace of construction increases and space decreases. Wood construction can thus deliver greater social benefit.



PI EKBLOM
ARCHITECT AND HEAD OF DEVELOPMENT FOR WOOD AT WHITE ARKITEKTER

“The greatest challenges we encounter in our planning relate to spans, fire and acoustics”

The opportunities of cross-laminated timber are based on its homogeneity as a wood material, which makes it easier to design with and rely on than wood in its original heterogeneous form. We now have a sheet material that can be used in floors and load-bearing structures, paving the way for new prefabricated processes where much of the work can be performed in a factory.

The greatest challenges we encounter in our planning relate to spans, fire and acoustics. Personally, I enjoy having to think about how to shape a design around the properties of a new material and the things it can do. A challenge for the industry will be to establish more project-specific processes with fast-paced flexibility, in order to better meet specific requirements in a way that ensures better resource use and architecture.

A further challenge is that forestry must be sustainable. It’s not just about promoting the positives of the forest as a carbon sink, but also to continue preserving biodiversity and the many assets of the forest.