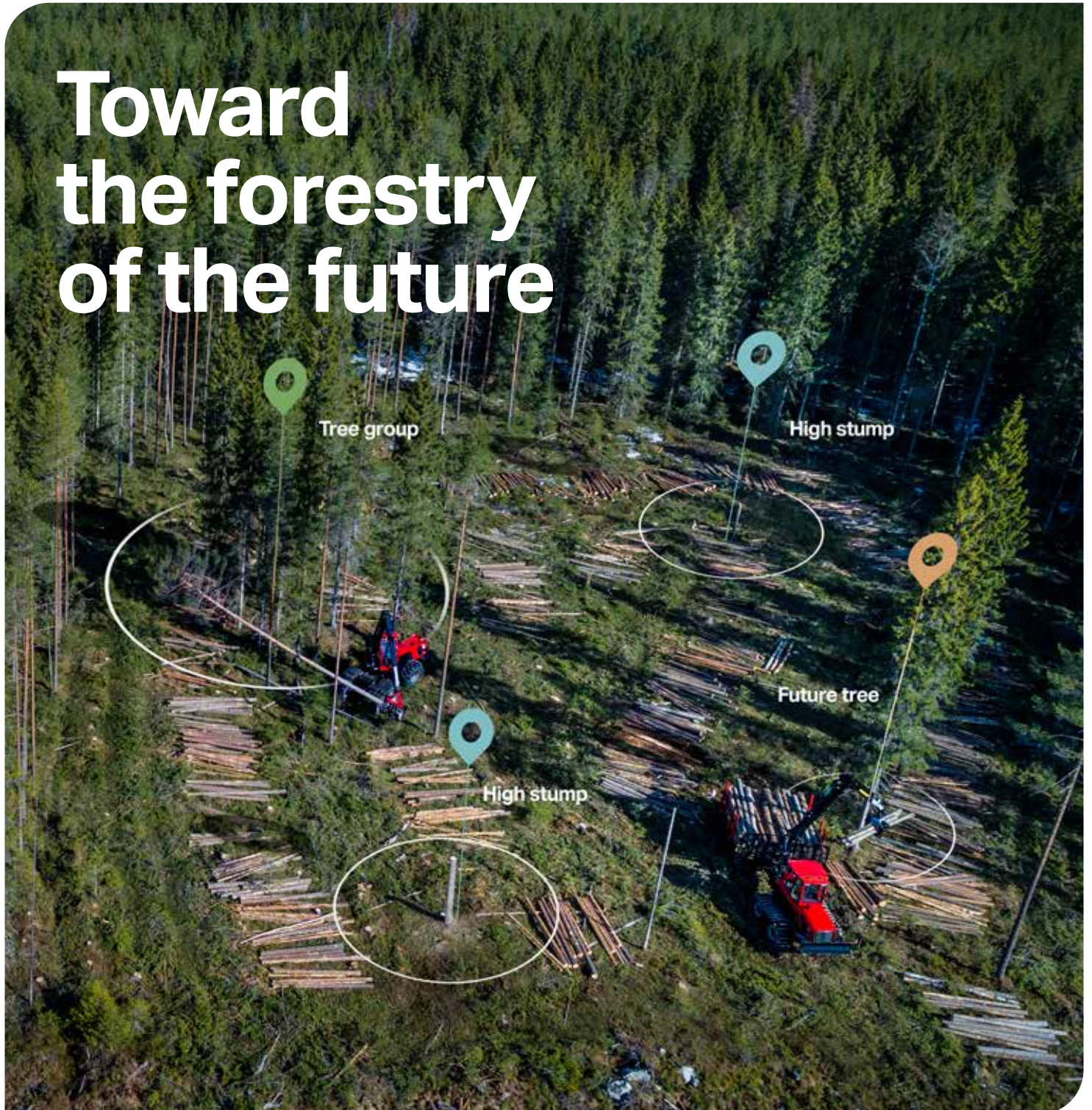


Just Forest

International Magazine from Komatsu Forest

Toward the forestry of the future





Nordic quality that lasts

Cooperation between companies
with cutting-edge technology

indexator.com

 **Indexator**

Tomorrow's technology for long-term sustainability

What do you think forestry will be like in ten years? In twenty years? Here at Komatsu Forest, when predicting the future, we envision two priority areas in particular: sustainability, in terms of both our forest machines and our operations in general, and digitalization, in terms of both intelligent hydraulics and the modern technology that enables increased precision and measurability in forestry.

When it comes to sustainability, we take a life-cycle approach to the machine, with the entire chain from sourcing materials through our production to how the machine is recycled comprising factors affecting our impact on future generations.

Last year, we presented the Centipede project, which will play a key role in being able to harvest forests in a sustainable manner. Another step in the right direction is the brand-new eight-wheeled Komatsu 951XC, a specialist for hilly or soft terrain and a development project you can learn more about in this issue.

Parallel to technological developments, digital developments are unfolding at a rapid pace.

Consider, for instance, how your machine's hydraulics have changed. Digitalization has provided amazing opportunities for intelligent hydraulics that can react in an instant to signals from the control system and even be monitored remotely. Smart Crane and Smart Flow are two shining examples of this, although smart solutions are found in other areas as well.

Our MaxiFleet service has been around since 2010, and during this time it has grown and evolved alongside advances in digital technology. The latest development in this area is something we have decided to call Precision, because that is exactly what it is all about. Today, we can pinpoint the positions of individual trees to within a few centimeters and then use that information for better planning, better follow-ups, and even the automation of some harvesting tasks. Smart, right? Keep turning the pages to learn more about how this can help you.

Join us on our journey toward a sustainable future!



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Durable forest machines are this world champion's goal

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Digital developments with



Geofence: Create digital fences around a harvesting area or to mark a protected area.

the operator in focus



Digital developments unfold at a furious pace, and for forestry this means opportunities for new, smarter ways of working. Now that Komatsu's forest machines have been refined to use accurate satellite positioning technology, MaxiFleet can show the machine's position to within just a few centimeters, providing the foundation for a new and exciting function, Precision.

GPS positioning has long been used in forestry and has helped in the development of work methods, facilitated collaboration, and increased productivity. However, an error margin of 0–10 meters has meant fairly inaccurate positioning. Until now.

Today's new RTK GNSS technology enables positioning with an error margin of just a few centimeters, paving the way for countless possibilities and even heralding a paradigm shift in smart forestry.

"The new technology is a prerequisite for future solutions, but already today we can offer the exciting new MaxiFleet function Precision, which delivers valuable information and active operator support," says Jörgen Nilsson, Product Manager for Connected Products at Komatsu Forest.

Mark exact boundaries

One new feature is that you can use geofencing – a digital fence that is added

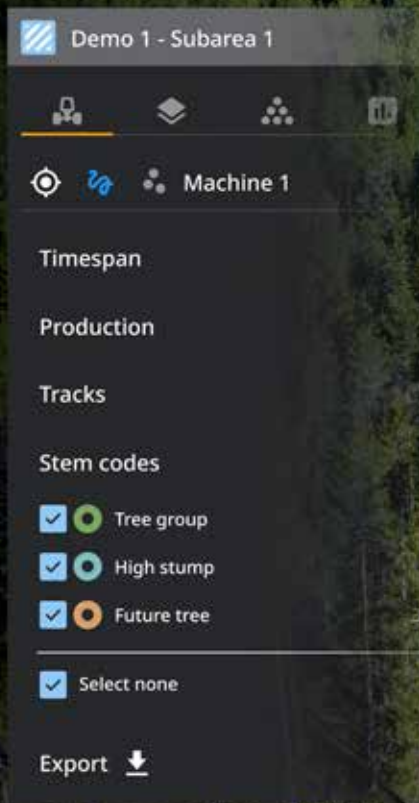
MaxiFleet

The digital MaxiFleet service provides you with a comprehensive tool for simplifying your working day – regardless of whether your fleet is comprised of one or one hundred forest machines. MaxiFleet helps you keep track of your machines, collaborate with colleagues, or make wise, fact-based decisions.

MaxiFleet encompasses six different areas:

- Work area management (plan for better results)
- Machine information (all machine information in one place)
- Interaction (interaction, support and training)
- Worksite collaboration (share information quickly and conveniently)
- Worksite information (work efficiently with minimal impact)
- Precision (precision positioning to aid your work)





Stem codes:

You can now code individual stems, making it easier, for example, to work with biodiversity considerations.

when planning an area. This could be around a harvesting area or to mark protected areas such as ancient monuments or charcoal pile remains. This feature means greater peace of mind for forest owners and operators alike as it indicates more clearly where the operator should harvest and the areas they should avoid. Geofences can also be linked to alarms to warn the operator when the machine or the crane tip is approaching such a boundary.

“This means that the machine operator can safely harvest close to an area boundary without the risk of harvesting the neighbor’s trees,” Jörgen explains.

View the machine on a map

Since the machine’s position can be determined with great precision, the user can also see the machine in the map program – including the direction of the crane and the location of the crane tip. This extreme precision enhances the practical usability of the map layer data for the operator. Another advantage of the new technology is that the machine’s route is plotted with significantly better accuracy.

Save time with digital solutions

The introduction of RTK GNSS technology also provides opportunities for a new way

»Geofencing is a digital fence that you can add when planning an area, such as around a harvesting area or to mark a protected area such as an ancient monument or the remains of a coal pile.«

JÖRGEN NILSSON, PRODUCT MANAGER,
CONNECTED PRODUCTS, KOMATSU FOREST

of working. Today, most forest companies have to physically walk around the forest to mark trees – and in winter this can mean skiing on deep snow. Thanks to this new technology, boundaries and specific trees can be marked digitally, based on map data from, say, drones or LiDAR scanning.

Keep track of the logs

We have long been able to show where a tree was felled, but with the greater precision now available, we can show the exact position of each felled log. This lets you know exactly where the timber is located, even in the dark or when covered with snow. This will also make it easier to see the assortment found in each log pile or at the roadside.

“It also offers future development potential. For instance, one plausible function would be to let the machine keep track of the timber volume until the operator believes it’s time to turn around and start loading so that the logs fit the load space. This could provide advantages in the shape

of both increased productivity and reduced fuel consumption,” Jörgen explains.

Easier to classify silvicultural considerations

Another new function is stem code visualization, which means that individual stems can be visualized using stem codes based on, for example, biodiversity considerations. Stem coding supports the operator in their work, enabling them to make better decisions more easily and making it easier to follow directives, such as for the distance between future trees.

Moreover, based on previously coded trees, MaxiFleet can suggest when it is time to cut a high stump or leave a tree standing, making your work easier. It can also keep track of the number of high stumps, meaning one less thing for you to worry about.

“Aside from making your work easier, stem code visualization helps show that the work has been conducted correctly and in accordance with the forest owner’s instructions,” Jörgen ends.

MaxiFleet Precision

The GNSS system uses several satellite systems to determine positions. This refinement has been enabled by the arrival of several new satellites, including the commissioning of Galileo, the European GNSS system. **RTK** (real-time kinematic) positioning. Accurate positioning using satellite data requires more known measurement points to help correct the satellite’s signals. Previous technology has been based on only the machine having a signal receiver, but thanks to networked RTK, the machine now has access to several fixed reference stations. These are used to correct any errors in the satellite signals, thereby improving positioning precision from several meters to a few centimeters.



Jörgen Nilsson, Product Manager, Connected Products, Komatsu Forest.

Komatsu Forest in Tenerife

The island of Tenerife is commonly associated with vacationing, sun, sand, and sea. However, in recent years, this idyllic getaway has often been threatened by wildfires. Now, a Komatsu 931XC harvester and a Komatsu 845 forwarder are helping to minimize the fire risk on the largest of the Canary Islands off the west coast of Africa.

These two machines are also the first Komatsu forest machines in Tenerife and are even equipped with the digital MaxiFleet service to enable smart nature conservation and silviculture.

More than forty percent of Tenerife's land area is protected by law. Some 19,000 hectares comprise Parque Nacional del Teide, the fifth largest national park in Spain named for the volcano Pico del Teide, which stands 3,715 meters tall. The risk of wildfires on the island is great, with about 3,000 hectares of forest destroyed in wildfires last year alone.

To help keep the risk of wildfires as low as possible, a smart fire management system has been put in place. Accordingly, when deciding which trees to remove, the focus is on conservation rather than economic considerations. If the trees are too close, fire can spread uncontrollably in a very short time in the event of a wildfire. If, on the other hand, too many trees are removed, there is a risk of land erosion due to the brittle lava rock.

MaxiFleet provides support

The head park ranger decides on a case-by-case basis how many trees are to be removed. MaxiFleet, one of our tried-and-tested digital tools, enables work orders to be created centrally and sent to a suitable machine. When the operator selects one of these areas in the machine's control system,

the necessary map information, such as roads, is immediately visible to them via the MaxiVision GIS service. Information on the locations of the trees to be harvested can be imported to the harvester and forwarder before or after the work is begun.

When the harvester starts locating the trees to be removed, the GIS maps in the machine help the operator assess the terrain in advance, as the many steep slopes and loose rocks can be extremely challenging to navigate.

Minimizes the risk of wildfires

Before the forwarder starts loading the assortment, the operator is provided with an overview of the area to be cleared. This helps keep the number of trips across the brittle lava soil as low as possible by always ensuring optimal use of the forwarder's capacity.

The GPS coordinates of the log pile, as well as the harvested quantities, are then automatically transferred to MaxiFleet. The park ranger can retrieve detailed information about how the work is progressing as well as machine performance evaluations. The information from the machines is fed into the national park's management system almost in real time.

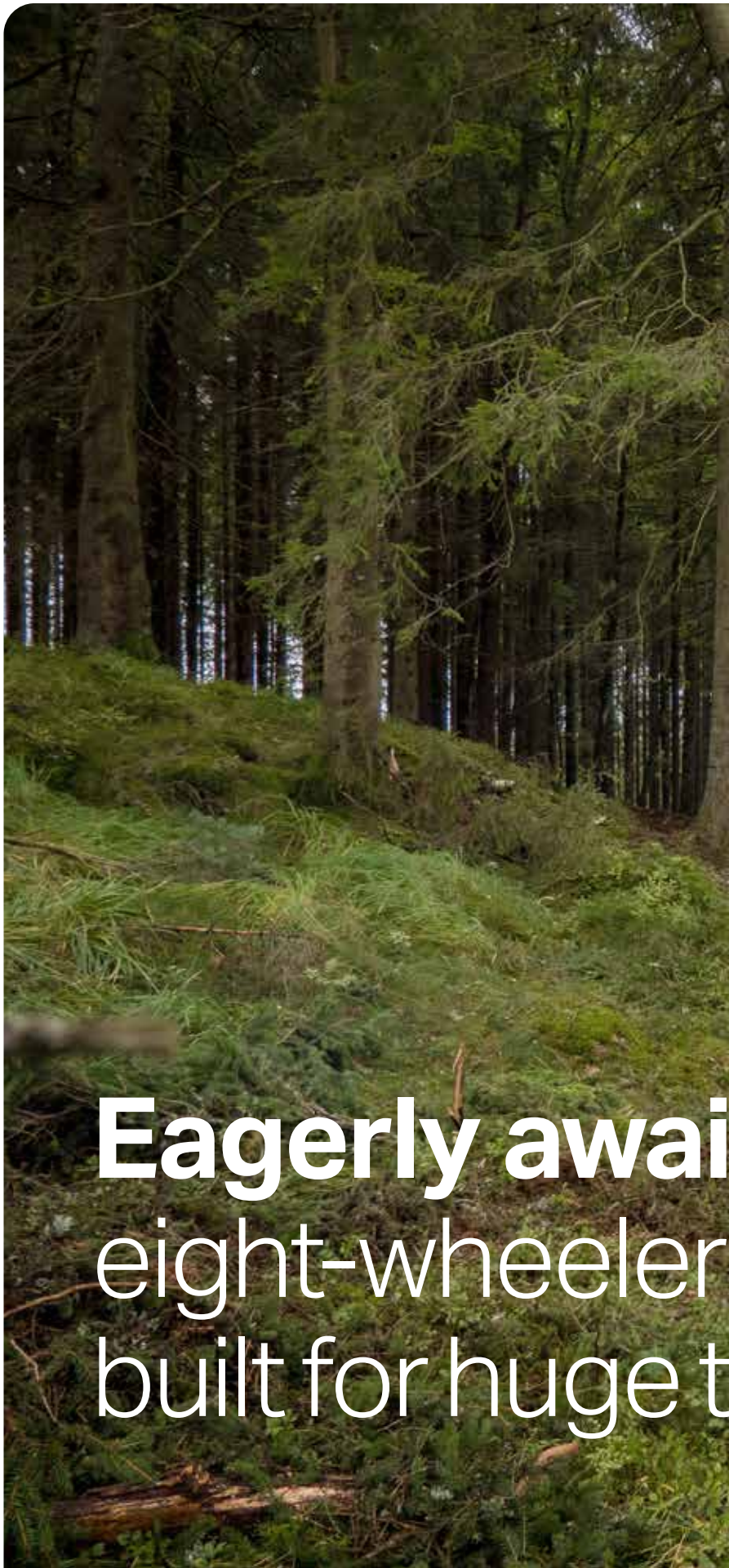
This way, together with the sophisticated MaxiFleet software, the machines can help minimize the risk of wildfires while keeping both the park ranger's workload and the impact on the forest floor as low as possible.



Arrival of the first Komatsu forest machine in Tenerife, a 931XC harvester.



Demand for an eight-wheeled harvester for final logging has been great, and finally it is here, in the shape of the new Komatsu 951XC. A machine that combines tried-and-tested innovations with new solutions. Joakim Johansson, Product Manager Harvesters at Komatsu Forest, reveals more about the ideas behind the new eight-wheeler.



Eagerly awaiting
eight-wheeler
built for huge t

ted
rees





»We now have a complete range of eight-wheeled machines specially designed for demanding conditions.«

JOAKIM JOHANSSON,
PRODUCT MANAGER
HARVESTERS AT KOMATSU
FOREST

The Komatsu 951XC is a final logging specialist and the third addition to Komatsu’s eight-wheeled harvester range.

“We now have a complete range of eight-wheeled machines specially designed for demanding conditions,” says Joakim Johansson, Product Manager Harvesters at Komatsu Forest.

Compact yet strong

Demand for an eight-wheeled harvester for final logging has been great, and the idea of an eight-wheeled 951 has been around for some time. The challenge was to design a machine for harvesting large trees without making it too cumbersome.

“What’s special about the 951XC is that it combines the strength of a 951 with an extremely compact design. It actually has about the same dimensions as a 931XC and so can even be used in denser stands,” Joakim explains.

The Komatsu 951XC is optimized for use with the Komatsu C164 – a harvester head specially designed for logging large trees.

“However, naturally, it works just as well with our highly popular C144 head. This makes it a versatile machine with the capacity to harvest extremely large trees,” says Joakim.

Low ground pressure and great stability

Thanks to the eight-wheel design, the 951XC delivers lower ground pressure, meaning less impact on the forest floor. It is mainly intended for final logging in hilly terrain and on soft ground.

Another important factor when working in steep terrain is stability. The Komatsu 951XC has a number of features that make it one of the most stable harvesters on the market. In addition to the tried-and-tested Komatsu concept, the eight-wheeled XC series harvesters have a bogie on the rear frame with two suspension systems – comprised of the swinging rear axle and a bogie – giving the machines completely unique handling characteristics.

“Our bogie with twin suspension systems is an innovation of which we’re extremely proud.



New on the 951XC

New working hydraulics to better utilize the hydraulic motor and also provide a machine with faster feeding from start to maximum speed.

Hub reductions provide an advantage when working in challenging conditions, such as steep, snowy, or wet terrain, as they increase the life of the bogie and thereby machine reliability.

Option: We are broadening the range with a reinforced hood guard for the engine hood, made of larger gauge piping than the standard hood guard.

As well as increasing stability by lowering the machine's center of gravity, the machine follows irregularities in the terrain in a forging manner while delivering excellent maneuverability in challenging terrain conditions," Joakim explains.

A workplace to long for

The cab is one of the most important parts of a machine – after all, this is where you spend your working day as an operator. Just like all Komatsu harvesters, the 951XC has a comfortable operator environment with a spacious cab, excellent visibility, and a pleasant cab climate.

Thanks to the machine's stability and leveling cab, the operator is always seated level without the need to stretch and strain to maintain a good seating position.

"A relaxed operator can keep their energy level up as well as maintain their focus and a high production rate for longer. And if you choose the Smart Crane option, you get an even more easily maneuvered crane that delivers amazing precision," Joakim comments.

Based on tried-and-tested solutions

In the development of the Komatsu 951XC, the engineers at Komatsu Forest have been able to turn to innovative, tried-and-tested solutions devised in the development of previous models. Over the years, these have been refined by means of continual improvement. One example is the parallel crane, which thanks to its clever design is fast in its outward movements, when the head is unloaded, and powerful in its return movements, when the head is heavily loaded. Another example is the levelling function for the cab and crane that makes the machine a strong performer even on inclines, which is, of course, especially advantageous when harvesting in hilly terrain.

"There are many good examples of innovations that have stood the test of time. My favorite probably remains the Komatsu concept, a feature that came about back in 1984 and means that even today we still have some of the most stable machines on the market," Joakim ends.

The pathway to a new machine

The process from idea to new machine working in the forest is long, and someone who has a thorough understanding of all its parts is Göran Lövgren, Technology Manager Harvesters at Komatsu Forest.

Göran Lövgren has worked at Komatsu Forest's design department since 1988. Over the years, he has worked with the development of forwarders and harvesters alike, but since 2009, he has been technology manager for harvesters. We asked him to reveal more about the actual process of developing a new machine.

The process begins

The foundation for efforts to develop a new machine model is the recurring meetings between the design department and, among others, the marketing department. These are used to analyze needs, upcoming legal requirements, preferences, and possible improvements.

"Once we believe there's enough merit, we can initiate a feasibility study," Göran explains.



The feasibility study always begins with the project team gathering opinions. They talk to everyone who works with customers, such as the marketing and aftermarket departments, but also our service providers. Other important sources of information are the quality department and the production department.

"We also conduct internal work within the design department to look into the possible functions we could develop," says Göran.

Once all the opinions have been analyzed, a long list of functions and characteristics remains, which is condensed into a specification ready to be presented to executive management.

"If management says yes, the real project begins, which also means bringing more people on board our working group," says Göran.

"Like a giant Lego set"

Göran explains that the role of technology manager entails coordinating all the technical aspects of the project. The entire machine – head, crane, control system, and chassis – are to work together as a whole.

"There are many things that complicate a project, such as the different emissions legislation in different countries. So, there isn't a single engine, instead there are several versions for each machine model. We also have several different heads, and each machine model must work with the heads we recommend," says Göran.

The project team is comprised of a technology manager, a project manager, designers, and a product manager, as well as a number of people from other departments. Everyone works together to create a machine with the right characteristics, making it not only suitable for the intended



As product manager and technology manager, Joakim Johansson and Göran Lövgren play important roles when a new harvester is to be developed. Between them, they have over 60 years' experience of product development at Komatsu Forest.

markets, but also compatible with our production apparatus.

Göran's job involves ensuring that all sizes and models are correctly specified. This means the right hydraulics, the right powertrain, the right crane that can carry the head, and more – and everything must be correctly dimensioned.

"It's like a giant Lego set from which you can make any number of things," Göran explains.

Verification, adjustments, and tests

Once the project has started, there are other things to be done. These include a large number of verifications to be conducted throughout the project. Once the prototype is ready, Göran visits the forest to see how the machine works in real life.

"I work a fair bit with forest trials – we fine-tune the control system and optimize the interaction between crane, engine, and head. It's quite simply a case of adjusting the machine so that it works."

In conjunction with the completion of the prototype, another almost complete machine is ordered and installed in the test

rig. Here, fatigue tests are run to ensure that the machine is up to scratch.

Once Komatsu Forest's test operators have thoroughly tested the machine, it is sent to be tested by contractors throughout Sweden – before the final adjustments are made and the machine enters serial production.

The work to develop a new machine is a massive team effort. Knowledge and input from many different departments and roles are required to realize the machine. Moreover, reference groups comprised of operators and contractors are often used throughout the development process for a new machine. These reference groups are invited to visit the factory to test and get a feel for the machine and offer their opinions on numerous occasions throughout the project.

"This way, we ensure that we incorporate important input from the people who will actually use the machines in demanding conditions in the forest," Göran ends.

»In the past, you spent a great deal of time repairing your machines, but today you spend it producing instead.«

HANNU HIEKKALA,
METSÄPALVELU HIEKKALA

Taneli carrying on the tradition

The Finnish company Metsäpalvelu Hiekkala has recently undergone a generational shift, with founder Hannu Hiekkala passing the baton to the safe hands of his nephew, Taneli Ritanen.

It all started in 1978 as a sideline. Today, it is a well-renowned company ranked among the top five in Finland when it comes to good measurement quality.

The company has been riding the waves of machine technology evolution ever since 1978, the year in which Hannu Hiekkala founded the company, albeit on a small scale, with a few forestry tractors. In 1988, he bought a used 901, heralding the start of the company becoming a full-time occupation. Following this, the company grew rapidly, with the first brand-new 901 being bought in 1990 in conjunction with operations being expanded to two shifts and four employees. The company has had two machine groups since 1994, and Hannu's strategy has been to keep the fleet young. Over the years, the company has purchased 35 new machines, 28 of which have been red.

That the machines have evolved over time goes without saying.

"You can compare them to cars. Today, you can easily drive all year round with only a single annual service. The same applies to forest machines. In the past, you spent a great deal of time repairing your machines, but today you spend it producing instead," says Hannu.

Comfort is another aspect that has changed drastically. The advent of hydraulic cab suspension on forwarders meant outstanding operator comfort, far removed from the shaky, noisy cabs of the past.

"Cab damping is something that life insurance salespeople should demand for older operators," Hannu jokes.

Another important development step that Hannu raises is that since the 1990s, the machines have been able to measure the timber automatically and reliably, removing the need for manual measurements.

"That made a major difference in the forest, as it used to be full of people

walking around measuring logs," Hannu says. "The next improvement came in 1995, when you could send measurement data to clients with a simple push of a button, which was far better than pockets full of sheets of paper covered in measurements."

Another important milestone was when Komatsu acquired Valmet.

"After that, machine quality improved significantly, as did service," says Hannu.

At that time, Komatsu expanded its operations with a service shop in the Finnish city of Jyväskylä. This made Hannu's business much easier, as before he regularly had to make trips to and from Tampere, some 200 km away, to buy spare parts.

Second generation taking over

The company has always strived to deliver excellent quality and has a favorable reputation among forest owners.



Hannu Hiekkala with his nephew, Taneli Ritanen.

For several years, they have also been ranked among the top five companies when it comes to achieving the best measurement accuracy. However, as time passed, it was natural for Hannu to start thinking about retiring and what would happen to his company.

Taneli Ritanen, Hannu's nephew, has been a natural part of the company for a long time. Already at the age of 15, he took a summer job at the company clearing stumps. Following his military service, the forestry business was in a recession, and anyone who was involved in 2009 and 2010 will certainly remember just how difficult things were. As a result, Taneli started working in the forest industry, where he remained for 15 years, although always with one foot in Hannu's company. He has always worked on the side of his regular job at the Metsä Group Bioproduct Mill and, for the past five years, has spent all his free time working for Hannu. Eventually, the two began dis-

cussing what would happen to the company, and the idea was put forward for Taneli to take over the business. It has been a lengthy process, but since the fall of 2022, Taneli is the principal owner.

"Today, I own eighty percent of the business, and Hannu owns twenty percent. It's a real privilege to get into the business this way. I've worked at the company for a long time, but I also have Hannu's forty years of experience to fall back on, knowing that I can always call him to discuss matters. I think it's extremely difficult to start a business in this industry without that experience," says Taneli.

When asked what is most important for the future, Taneli answers:

"What is most important to us is to continue our fruitful partnership with Komatsu in Jyväskylä. Today, the pressure to meet deadlines is completely different. If a machine is at a standstill, we need spare parts immediately, and this

works really well. If I call the workshop at 6 pm on a Friday, they'll get the part to me so that I can continue working over the weekend instead of having to wait until Monday. This is extremely valuable to us. What's more, Komatsu's workshop stocks an exceptionally broad range of spare parts, which means we quickly get help and can be up and running again in no time."

Since Taneli took the helm, he has worked hard to develop the business. He has managed to add another major client to their customer base, enabling him to expand the business so that they now have five machine groups, three of their own and two subcontracted.

"It's great that things are going so well, and that we've grown so much this past year. It certainly helps us face the future with confidence," Taneli ends.

First to test the new grapple design



FREDRIK BYLUND,
TORBJÖRN JAKOBSSON
SKOG & ENTREPRENAD

Fredrik Bylund grew up in the forest and with forest machines. Helping out since childhood, his interest has never waned. However, when asked whether he wanted to get involved in testing Komatsu Forest’s new grapples, he was less than keen.

“I use a Komatsu 895 and my boss asked whether I wanted to help test one of Komatsu’s new grapples, the G87H. I said I wasn’t interested, that it was way too big.”

An agile grapple that can easily pick up and sort timber is extremely important to Fredrik, and when the test model arrived, his skepticism remained:

“I laughed as soon as I saw it and said that we’ll be sending it for use on a dedicated loader within weeks. It was massive, not at all something I wanted to work with.”

However, just a few shifts later,

Fredrik’s doubt had been replaced by conviction:

“Yes, I changed my mind pretty quickly. I noticed that I could work more productively and that, despite its size, the grapple was extremely easy to use.”

Fredrik goes on to explain that he considers the grapple to be the forward-operator’s foremost tool, and so one of the most important components. For him, the most important characteristics are reliable grappling, ease of use, and a high-quality build.

“And, I have to admit, all are fulfilled. It grapples the logs extremely easily and,

despite its size, makes picking up and sorting logs easy. And the materials and build are top-notch.”

Previously, Fredrik was an advocate of another grapple brand. Now, though, he believes that Komatsu has hit the right spot, even for him.

“I have to say that I find everything about the new grapples better. For my part, I’m also happy that I was persuaded to try a larger grapple. I can work it harder while still retaining the agility I need. It’s worked so well,” Fredrik ends.

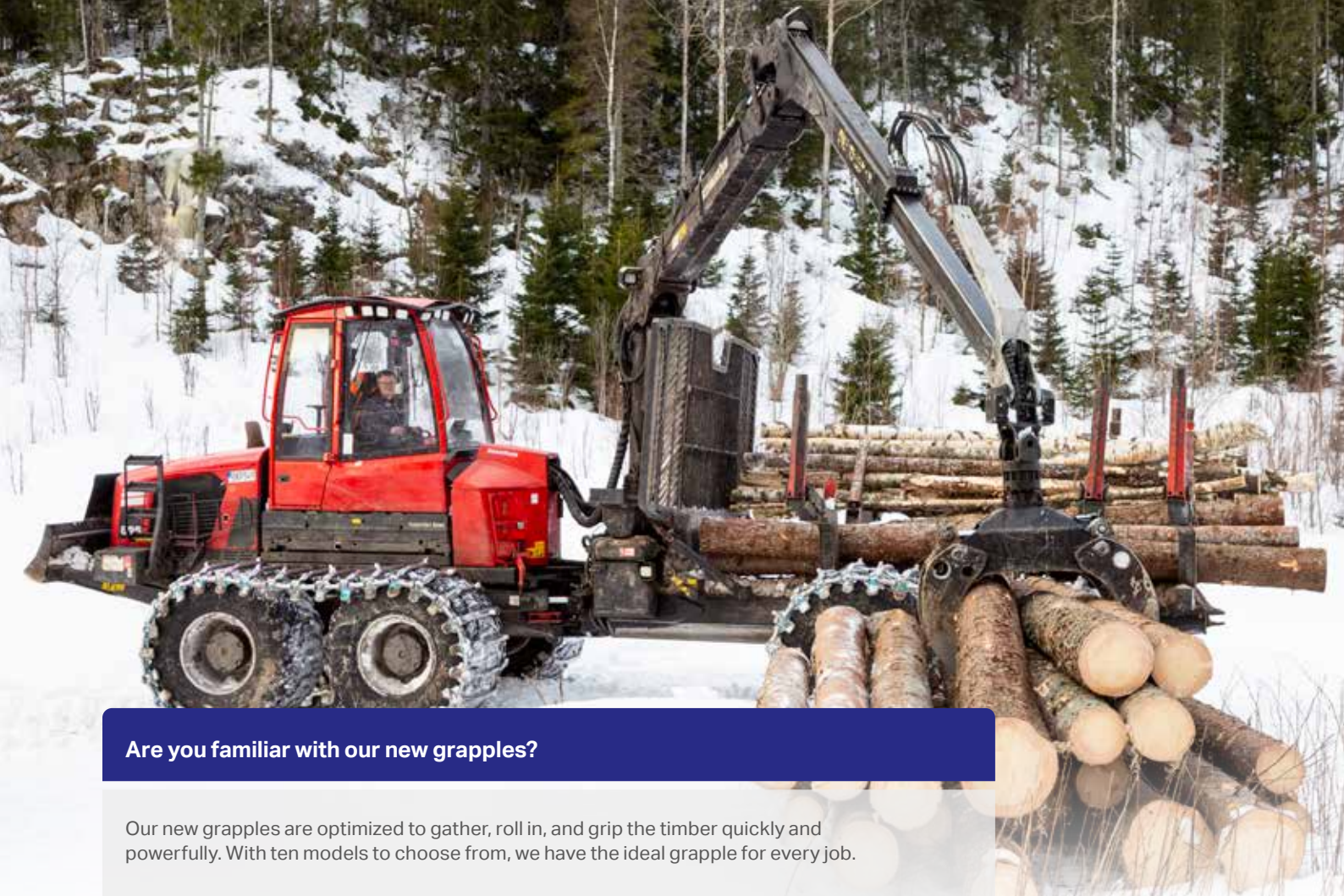
Measure with interval calibration

By default, the harvester head measures both the length and the diameter of each felled tree, and the operator uses so-called control trees to regularly calibrate the measurement system. This process has now been improved thanks to a new method that ensures better calibration data and reduces the risk of miscalibration. Also new is the integrated analysis function, which clearly visualizes the calibration results.



The stem profile can be used to analyze the filtered and unfiltered measurements of an individual tree.

Measurement points, trees, and the effect of the calibration are clearly displayed on the screen. The measurements are divided into intervals, enabling the operator to calibrate only the intervals showing deviations and encompassing sufficient measurement data.



Are you familiar with our new grapples?

Our new grapples are optimized to gather, roll in, and grip the timber quickly and powerfully. With ten models to choose from, we have the ideal grapple for every job.

Model	G82	G82E	G83	G84	G84H	G84E	G85	G85H	G86H	G87H
Grapple area, tip to tip, m ²	0.26	0.25	0.3	0.34	0.34	0.32	0.4	0.4	0.44	0.5

One important prerequisite for reliable calibration results is the best possible data. This new method ensures that a suitable number of stems is used for each calibration for increased precision.

“The data used for calibration comprises the ten most recently calibrated stems, but this can be adjusted to match your particular needs. The measurements are, however, made one tree at a time. When selecting control trees, the new software indicates whether each tree is within the necessary limits for good stem holding and so is suitable to use,” says Tobias Kopp, who works as a method instructor for Komatsu Forest in Germany.

The selected control trees are moved to a measuring caliper that is used to manually check the stems. The measurement data is

»The new software indicates whether each tree is within the necessary limits for good stem holding.«

TOBIAS KOPP,
METHOD INSTRUCTOR,
KOMATSU FOREST,
GERMANY

then transferred to the machine’s software.

“When a new stem is measured, the oldest stem is removed from the calibration data,” Tobias continues. “The differences in the measurements are clearly indicated in the new software, so the operator can quickly see what changes the calibration will result in. What’s more, the operator can easily analyze measurement errors.”

To further optimize the data quality, the operator can block not only entire stems, but also particular parts of a stem, thereby excluding them from the calibration.

After the initial calibration, there is no need to gather more trees as references. To improve length or diameter accuracy, the software can suggest that the operator runs a calibration cycle after felling a new tree.



"This picture was taken during the spring in the Karkonosze Mountains in Poland, near the border with the Czech Republic. I took the picture at the end of one of my night shifts. It was a spontaneous, spur-of-the-moment decision."

MATEUSZ BARAN, P.U.P.H. ALFA CZESŁAW STOCHMAL



Active forestry involves planting, clearing, thinning, regenerating, and harvesting the forest. This creates a living and fertile forest that can create value for generations to come. Over and over again.

Forestry for future generations

For Komatsu Forest, harvesting with harvesters and forwarders is the very foundation of our product range. However, in the light of the vision of circular forestry, supplementing our range with products for forest regeneration is a natural step.

Since the summer of 2022, Bracke Forest AB, which develops and manufactures soil preparation tools, mechanized reforestation products, and more, is part of Komatsu Forest.

"We're extremely happy to be able to welcome Bracke Forest to the Komatsu Forest Group. The company is an important piece of the puzzle in our efforts to realize circular forestry," says Peter Hasselryd, VP Marketing & Sales at Komatsu Forest.

"Reforestation is expected to expand worldwide, to meet the demand for both forest raw materials and environmental considerations," Peter continues. "As a result, there's a growing need for mechanized tools for reforestation as it involves manual labor for which recruiting a workforce is a real challenge."

Klas-Håkan Ljungberg, CEO of Bracke Forest, also sees advantages with the acquisition.

"Bracke Forest is a small company, but now we can leverage the Group's existing contacts when establishing our operations in new markets," he says.

Mechanized forest regeneration – for all markets

Bracke Forest manufactures forestry

tools with a strong focus on soil conservation and environmental management without compromising technical, or economic efficiency.

The first scarifier was manufactured back in 1965, progressing to exports just five years later. Since then, the company has mainly worked with products for forest regeneration.

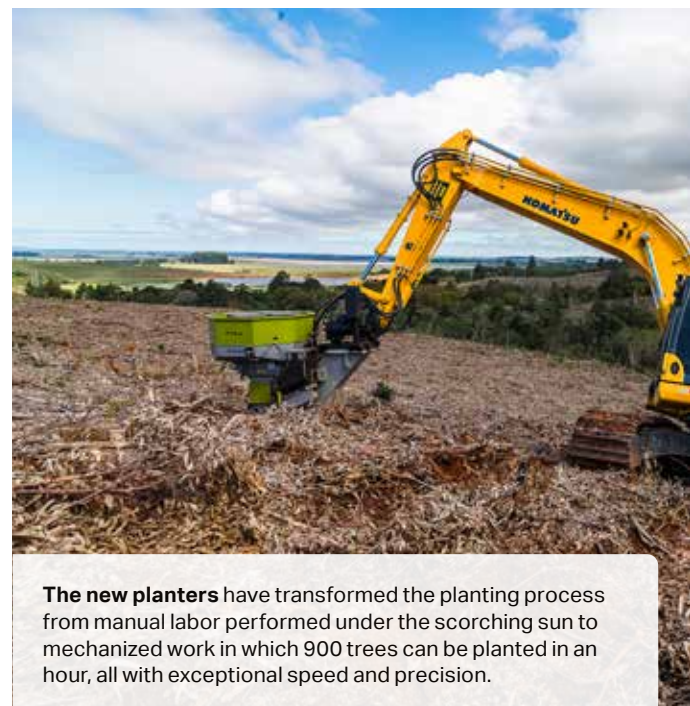
"Most of the markets in which we operate work with forest regeneration, although a smaller share are active with afforestation," says Klas-Håkan.

Since the mid-1990s, the company has also worked with planters, an area that is now growing.

"Our scarifiers are best suited to the northern half of the globe, in the coniferous forest belt. Our planters, on



To contribute to sustainable forestry, Komatsu strives to mechanize the industry, such as within planting, cultivation, and harvesting.



The new planters have transformed the planting process from manual labor performed under the scorching sun to mechanized work in which 900 trees can be planted in an hour, all with exceptional speed and precision.

»The market has matured now and mechanized planting is a given.«

KLAS-HÅKAN LJUNGBERG, CEO OF BRACKE FOREST

the other hand, are mainly used in the southern half, where forestry differs, with other financial considerations and shorter cycles,” Klas-Håkan explains.

The planters have been cleverly refined and, to some extent, have even displaced the scarifiers. This is because the planters do more than just plant. Preparation, planting, fertilization, and irrigation – processes that were previously conducted separately – are now all done at the same time, saving both time and money.

“In 2022, we saw a shift in our product sales, selling more planters than scarifiers,” says Klas-Håkan. “Among other things, we’ve gained a good foothold in South America, selling many machines there. The market has matured now,

and mechanized planting is a given,” he concludes.

The planters of the future

Komatsu Forest and Bracke Forest first entered their partnership back in 2014, and the sharing of knowledge has resulted in two unique products designed for reforestation: the Komatsu D61EM and the Komatsu PC210LC-10 combined with the Bracke P12.b.

The Komatsu D61EM is a tracked machine specially designed for mechanized reforestation and is proof of a successful development partnership in Brazil spanning several years. The machine is suitable for plantation forestry, such as on eucalyptus plantations, and can perform the entire planting process. This

is done automatically and at high speed using three planters in a row.

The Komatsu PC210LC-10 has been specially adapted to Bracke’s P12.b planter, which is a new planter that is particularly well suited to steep terrain. The head can handle the entire soil preparation and planting process and even be equipped with integrated fertilization and irrigation systems.

The same but different

The underlying role of soil preparation is to improve the chances of seeds or seedlings surviving and growing, that is, to protect them from pests or competing vegetation.

Despite this, there are major differences between the forestry conducted in the northern coniferous forest belt and the plantation forestry most commonly pursued in the southern hemisphere. In the north, the ground need not be worked particularly deeply before planting a seedling. The inverted humus method, which creates a raised mound for planting, is usually suffice.

In plantation forestry, the soil pan is so hard that the roots cannot pierce it, and so it needs to be broken apart before planting. A hollow or hole is also preferable, so that water remains around the plant and does not run away.



Julia Wikström is one of our many skilled mechanics who spend their days ensuring that your machine performs at its best. Having delivered countless hours of service, she has come across all kinds of problems – even those that can be avoided.



Six practical machine maintenance tips

“I think it should be considered a partnership. Together, we keep the machine in top condition to reduce downtime and maintain productivity. Being observant and spending a few minutes a day on maintenance is an easy and worthwhile investment. I hope that my tips can help more contractors keep their machines in good working order – which is better for everyone!”

1. Always keep an eye on your machine

Today, there’s a great deal of focus on full-time production – with as little machine downtime as possible. However, to prevent breakdowns and lengthy downtime, it’s extremely important to give your machine the once over each day. Walk around the machine before starting your shift. Are there any leaks? Any loose bolts? Such small problems can easily become bigger problems.

2. Use the maintenance journal

Sometimes time flies and you lose track of what maintenance was done and when. Some sort of maintenance journal is an extremely useful tool and, if you’re not already doing so, you should use it more often. You can create checklists and note your maintenance tasks in it. This way, you can always go back and check when which activity was done, what’s been repaired, and when. You will definitely have a better overview of the condition of your machine.

It’s also useful to be able to see what’s been done, what’s been repaired, and when. This is guaranteed to give you a better overview of your machine.

3. Create habits

Structure your maintenance – decide which weekday to do it, what to do, and how to follow it up. In the end, getting it done is all that counts.

4. Lubricate every day

Lubricating your machine is extremely important. It should be lubricated every day – not once a week or when the mechanic visits. To keep the machine in good condition, all lubrication points need to be lubricated. And don’t forget to check the central lubrication system, to ensure that the hoses are properly connected so that the grease ends up where it should.

5. Keep your machine clean

My top tip for keeping an eye on your machine more easily is to keep it clean. Remove twigs, brushwood, and any other debris. If you keep your machine clean, it’s much easier to spot any problems such as leaks and cracks.

6. It’s a partnership

While we have skilled mechanics and beneficial service agreements, it’s worth remembering that it’s a partnership between workshop and operator. So, it’s important that you perform your daily and weekly maintenance to keep your machine in top condition.



Spending a few minutes a day on maintenance is a worthwhile investment to reduce machine downtime.



Cristophe Cestona, area manager for the Limousin district, Aurélien Liraud, material manager, and Felipe Henriques, operator.

Peace of mind for the future – over 1,000 machines with ProAct agreements

In the fall of 2022, it was time for an impressive milestone – the signing of the 1,000th ProAct 2.0 service agreement. This particular agreement was signed with the French cooperative Alliance Forêts Bois, which was also the first company in France to sign a ProAct agreement when the service was first launched there in 2019. Christophe Cestona, area manager for the Limousin district at the cooperative, reveals more about their operations and their partnership with Komatsu Forest.

» Today, wood materials, which are renewable and ecofriendly, are seeing increasing demand, boosting the development of our industry. «

CRISTOPHE CESTONA, AREA MANAGER
FOR THE LIMOUSIN DISTRICT

Can you present your company?

“Alliance Forêts Bois is a cooperative. This means that the members who own the cooperative are represented by a board of directors comprised of such members. Today, the cooperative has more than 43,000 forest members, and we also work in three complementary areas. The first is forest consultancy, where we offer our members technical, financial, and administrative advice. The second is silviculture, where we consider each owner’s expectations and help them manage their forest and with reforestation. The third is harvesting and selling timber.”

How many employees do you have?

“Today, Alliance Forêts Bois and our subsidiaries have a total of 680 employees. The cooperative has been around since 1957 and, following a number of mergers, Alliance Forêts Bois was created in 2013.”

Where do you operate?

“We operate along the entire length of the Atlantic coast. Put simply, this is a line stretching from Montpellier in the south to Rouen in the north. This area is split into eleven sections encompassing a total of fourteen agents.”

Which type of forestry do you pursue?

“We work with both deciduous and coniferous forests. Naturally, this differs from region to region, but we work with construction timber, industrial timber and wood fuel.”

What machines do you own?

“Today, we own harvesters and forwarders, mostly Komatsu machines, although we do have other harvester brands as well.”

Why did you choose Komatsu Forest machines?

“It all began back in 2015, in conjunction with the reorganization of Komatsu Forest’s distribution network in France. We met up with the local team and got along well, which was the start of a rewarding partnership.”

Why did you choose to sign a ProAct service agreement and what benefits do you consider the service to offer?

“We signed it to optimize our machine maintenance. For us, the biggest advantages are simplified maintenance management and planning and shorter maintenance windows. What’s more, we receive a monthly summary that’s easy to understand and archive.”

What do you consider most important, in broad terms, to improve the service offering?

“To be even more proactive and listen when it comes to maintenance and

replacement parts, always with a view to maximizing efficiency.”

More generally, how do you envision the future of the forest industry?

“Today, wood materials, which are renewable and ecofriendly, are seeing increasing demand, boosting the development of our industry. However, we must be to the fore when it comes to suggestions and changes concerning industry practices so that our operations are not adversely affected.”

What do you consider most important in your relationship with Komatsu Forest?

“In my opinion, a relationship must be viable over time and based on listening to each other. Innovation, machine reliability, and a favorable total cost of ownership are also important considerations.”





As a computational engineer, Emelie Wibron ensures that the parts of the next generation of Komatsu machines are fit for purpose. On the floorball court, she has been one of the world's best players for many years.

Durable forest machines are this world champion's goal

On the floorball court, she is a world champion. At work, she develops the next generation of forest machines – ensuring that they can withstand the strain.

"I always want to perform well, whether at work or playing floorball," says Emelie Wibron, a computational engineer at Komatsu Forest.



Since Emelie Wibron made her debut in Sweden's national floorball team, she has won six world championship gold medals. She scored the deciding goal during extra time when the final was played on the team's home court. She is also the player who has scored the most points – goals and assists – in the history of the national team. For anyone who follows the sport, it came as no surprise when she won the world's best floorball player award.

Emelie's regular job is as a computational engineer at Komatsu Forest in Umeå, Sweden. She spends most of her time working with strength calculations. With the aid of advanced computer simulations, she ensures that the next generation of forest machines can handle

challenging conditions and heavy loads.

Two things that she never fails to bring to the table are drive and ambition. She wants to set the bar high, whether in floorball or at work. And, on occasion, her engineering work can provide almost the same kind of kick as winning a match.

"This could be, say, when I've been involved in developing a machine part that makes it a better product for the customer."

While Emelie mostly works with Komatsu's forwarders, she always has many irons in the fire.

"I'm usually involved quite early in various development projects, developing new concepts. It's like continual problem solving, which I really enjoy."



Emelie Wibron

Name: Emelie Wibron
Profession: Computational engineer at Komatsu Forest in Umeå, Sweden
Floorball club: Team Thorengruppen
National team: Since her debut in Sweden's national team in 2009, Emelie has scored more than 200 points (goals and assists) in just over 100 games. This gives her the highest ranking for both number of games played and points scored.

Facts about floorball

Floorball is a ball game and team sport that is usually played indoors, with each team having five players and a goal-keeper. The sport was developed in Sweden in the late 1960s. Since then, floorball has grown rapidly. The International Floorball Federation, the IFF, now has about 70 member nations and some 400,000 registered players. The World Masters Floorball Championships are held every other year, and the Women's World Floorball Championships will be decided in Singapore in December 2023.

She also participates in the practical testing of the machines, which is conducted both at the test center and out in the forest. When a prototype has been built and is ready for testing, most things – following many computer simulations and analyses – are usually pretty much finished and fully functional.

“That’s when we have a concept we believe in, and computational results showing that it should work.”

Komatsu’s smallest forwarder weighs about 15 metric tons and the largest 25 metric tons. They can carry almost as much cargo as they weigh. So, it goes without saying that they are subjected to extreme loads, especially the underlying structure, the chassis, and the load area.

“Even the load area gate takes a beating. Some operators’ approach means that the logs hit the gate with some force before being dropped onto the bunks.”

Another challenge is that all our machines are used in different types of terrain all over the world – and that all operators use them in different ways.

“So, they’re exposed to a wide variety of loads,” says Emelie.

Several different development projects are often pursued at the same time. Some may

»I believe that electrification will be the next big technological leap.«

EMELIE WIBRON, COMPUTATIONAL ENGINEER

have a clear purpose, such as to develop a new Komatsu machine meeting certain specific requirements, while others are focused on developing technology and innovations to be incorporated in future forest machines.

“When we design new machines, the goal is often to increase customer productivity compared to previous machine generations, to improve the operators’ work environment, or to minimize machine impact on soil and the environment,” says Emelie.

What do you believe will be the next big technological leap?

“In recent years, we’ve seen a strong focus on sustainability and emission reductions. So, it will probably be replacing fossil fuel with electric power. And this will be a major challenge as there are no charging stations in the forest, but I still believe that electrification will be the next big technological leap.”

Are you an engineer even on the floorball court?

“I don’t know [laughing], but I’m quite an analytical person, and I find tactics and statistics and identifying different patterns in the game fun. So, maybe I’m a bit more of an engineer on the court than many other floorball players.”

Uruguay's soil and climatic conditions both favor fast-growing trees such as eucalyptus.



A growing forestry industry

Over the past 30 years, forestry in Uruguay has grown significantly, becoming one of the country's most important growth areas.

Uruguay is a country that takes a long-term approach in its legislation and policies, one example of which is the forest act from 1987, which allocates an area covering no less than four thousand million hectares to forestry.

In 2020, just over one million hectares were planted, reflecting the

development potential found in the country.

Both the soil and the climatic conditions greatly favor fast-growing trees such as eucalyptus and pine. Add to this the large land areas available for forestry and the fact that Uruguay can deliver high-quality wood. The country currently

Experienced team player in charge in U

Juan-Pedro Rombys, 35, is the new head of Komatsu Forest's operations in Uruguay. With a degree in agricultural management and eight years of forestry industry experience, he hopes to leverage this knowledge to aid the company's development in Uruguay and throughout South America.

His reason for switching industries is partly down to Komatsu being a major company and partly because he likes a challenge and the opportunity to develop long-term projects. He considers Komatsu to be an amazing company with experienced colleagues who can support him on this journey.

"I see great growth opportunities for Komatsu in Uruguay. I want to create a stable team that can make Komatsu

a forestry industry leader, thereby securing our long-term viability," says Juan-Pedro.

And teamwork is something he both appreciates and has ample experience with. Between 2008 and 2019, Juan-Pedro played on the Uruguay national rugby team - Los Teros, appearing in two World Rugby Under-20 Championships, retiring from the sport after the Rugby World Cup in Japan in 2019.



has the largest share of certified forests in all of South America.

All of this has made Uruguay a popular choice for generous foreign investments for industrial purposes, such as sawmills, industrial engineering companies, and pulp production.

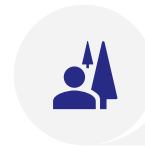
Today, pulp production represents one of the largest shares of the country's exports. There are two major companies producing pulp

– Montes del Plata, which has one pulp mill, and UPM, which this year is inaugurating its second plant. The latter represents the largest-ever foreign investment in Uruguay and will have the capacity to produce 2.1 million metric tons per year.

This latest addition represents both a new challenge and new opportunities for the forestry industry as production, competition, and demand are expected to increase.



Juan-Pedro Rombys sees great growth opportunities in Uruguay.



Announcements



A familiar face in a new role

Since February 1, 2023, **Mika Latvala**, 38, is the new aftermarket manager for Komatsu Forest Oy. Mika joined the company back in 2005 and has mostly worked with spare parts sales but even as a belts and chains expert and with service agreement sales.

Thanks to his active customer and dealer contact over the years, he is already a familiar face to customers and dealers alike.



New CEO in Brazil

Eduardo Sperandio Nics has been appointed CEO of Komatsu Forest Brazil. With more than 20 years of marketing and sales experience from the capital goods industry, his greatest motivator is bringing out the best in people and organizations and using it to deliver positive effects and results.



New valve assembly for greater reliability and performance from the **Komatsu C144**

Late fall 2022 saw the launch of the upgraded **Komatsu C144**. The standout change is a brand-new valve assembly that increases the head's reliability and performance. Better stem holding during felling is another improvement. Operators who have tested the new Komatsu C144 say that the head is more responsive and summarize its handling as "distinct".

New miniatures

The new **miniatures** are copies of our Komatsu 875 and Komatsu 931XC forest machines and Komatsu C144 head. The models are 1:32 scale collector editions and can be purchased from our online store.



Check out our online store where you can find clothing and other branded merchandise!

The right parts close to the machine keep it up and running

In the forest, the nearest workshop or spare parts depot is often far away. At the same time, a smooth workflow and minimal unnecessary downtime are key. So, to make things easier for machine contractors, Komatsu Forest offers an **Uptime Kit** that gathers a carefully chosen selection of critical components. This gives you peace of mind knowing that these select components are close at hand to minimize downtime and keep your machine up and running. Contact your service provider for more information about the kit.





Cutting the symbolic inauguration ribbon.

From left to right: Helene Hellmark Knutsson, Governor of Västerbotten County Jens Bengtsson, CEO of Komatsu Forest Tetsuji Ohashi, Chair of the Board of Komatsu Ltd. Hiroyuki Umeda, Executive Officer, Komatsu Forest

Inauguration of new factory in Umeå

In **October 2022**, the new factory in Umeå was officially inaugurated in a festive ceremony. In addition to the employees, the companies involved in the project, and municipal representatives, Tetsuji Ohashi, Chair of the Board of Komatsu Ltd., also participated in the ceremony.

Komatsu Forest live-streamed the event, enabling all employees to follow the inauguration as it happened.

In his speech, Mr. Masaki Noke, the Japanese Ambassador to Sweden, also referred to the strong ties between the two countries.



Many employees took the chance to watch the inauguration in person. For all other employees, the ceremony was broadcast live to all subsidiaries around the world.



Announcements

Welcome to Umeå!

Due to COVID-19 travel restrictions, customers and employees were unable to visit the new factory in Umeå, Sweden, for some time. However, since the fall of 2022, visits are once again possible and we are pleased that, in addition to customers, suppliers, and schools across Sweden, we can now welcome guests from all over the world to Umeå. Below are a couple of recent examples.



The central European dealer meeting was held in Umeå at the end of September 2022. Komatsu's dealers from eleven different countries met in northern Sweden for two days. In addition to sharing experiences, the main focus of the meeting was on product training and discussions with the product managers.



Some 180 Komatsu customers and members of the press from Finland visited the new factory in Umeå in November last year. In addition to a tour of the factory, an informative program of events was followed. Discussions with product managers and R&D were held, with digitalization and spare parts among the topics on the agenda. The visit was rounded off with the chance to thoroughly test the Smart Crane function for harvesters and forwarders.

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