Welcome to the Spring issue of Forest Bioenergy Review, which now moves into its second decade of publication. As we endure the ongoing impact of Covid-19, we have continued to listen to our readers as we all strive to lessen our carbon footprint during the pandemic. It has become clear that those who are at the forefront of providing the energy we consume are faced with ever-expanding legislation and restrictions to meet sustainable levels of production.

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Recently, I was talking with the owner of a power plant that currently uses a mix of wood and household waste, but has now diversified by investing a significant sum in 15 wind turbines to provide continuity for his customers in the years ahead. This type of diversity has also been echoed by our readers and, going forward, we will continue to focus on biomass, but also include news on wind, solar, hydropower and other types of biofuels.

The Summer issue of FBR will feature the following subjects: biomass shipping, handling and logistics; biomass gasification; fire and safety solutions; and wind power.

Vince Maynard, Publisher

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Front cover picture: Nova Pangea Technologies p.12

Resource efficiency, flexibility and clean solutions are the key for success in changing energy markets. Based on our decades-long experience, we have the know-how to deliver the best solutions based on biomass, waste or on a mixture of different fuels.

Valmet’s proven automation solutions help you to optimize your energy production and our network of service professionals is ready to recharge your competitiveness both on-site and remotely. Explore valmet.com/energy
Welttec builds biogas plant in Finland powered entirely by liquid manure

Welttec Biopower recently commissioned a biogas plant near Turku in southwestern Finland. This region is characterised by livestock farms and therefore the 250kW plant runs entirely on liquid manure. The energy plant belongs to a group of three pig farmers. In this project, the German plant builder co-operates with its long-standing Finnish partner Doranova.

The orientation of environmental policy in the Scandinavian state is increasingly based on sustainable nutrient recycling. Agriculture in particular plays a strategically important role in regions with intensive animal husbandry. While in other parts of the world manure and slurry are seen as waste, the Finns rely on the advantages of this so-called black gold. Fertilisation with this organic substance improves the structure of the soil and increases the carbon storage in the ground. Moreover, an upstream biogas process delivers climate-neutral energy and ensures even better plant availability of the fertiliser. Both the farm structure and the location of the Finnish pig farmers present an ideal setting for the new anaerobic digestion project. Currently, three fattening houses are being built in addition to the existing piglet production sites. In this way, some 40,000 tons of pig manure are available as input material for the stainless-steel digester, which has a capacity of 4,903 m³. Other substrates will not be used. The heat generated by the 250kW CHP unit is used to preheat the liquid manure, which is first buffered in an upstream slurry pit. To minimise the loss of heat in the harsh-Finnish winter, Welttec equipped the digester clogging with an extra-thick-insulation layer. This will result in a more efficient digestion process.

The fully automated biogas plant operation culminates in the separation of the digestate. By compressing the nutrients, the transportability is increased and this helps to balance any regional nutrient surpluses and reduce the entry of these nutrients in the Baltic Sea and other bodies of water. “Back in 2013, we received the Baltic Manure Handling Award in Helsinki in recognition of our biogas technology to reduce the accumulation of nutrients close to water,” reports Häijo Scharbok, Head of Sales at WELTEC, and adds: “We emphasise individual engineering and a high technical standard. This is something our customers in 25 countries greatly appreciate.” With the help of biogas technologies of experienced manufacturers like WELTEC, BIOPOWER, Finland is sure to reach its recycling target. By 2025, 50% of the approximately 17.3 million tons of animal dung are to be processed. Apart from the energy production, this will cover more than three quarters of the phosphorus required for arable farming. Such efficient nutrient recycling effectively prevents the eutrophication of the water system and eliminates the need for elaborately produced artificial fertiliser,” says Mikko Saalasti, Head of the Biogas department of Doranova. According to Saalasti, the use of nutrients from the black gold thus represents an essential step towards the improvement of all water systems in the country. In addition to water protection, the production of green power will also ensure climate protection.

A video about the construction process of the plant can be found here: https://www.youtube.com/watch?v=ykD6AwA7E

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Wärtislä combines heat and power plant helping Germany reach its green energy goals

“The recently completed combined heat and power (CHP) plant supplied by Wärtsilä to Kraftwerk Mainz-Wiesbaden (KMW) in Germany has been officially handed over for commencement of commercial operations. The handover took place on 23 December, allowing municipal energy provider KMW to reliably provide 200MW of electrical power. The CHP plant feeds the excess heat generated during power generation into the Mainz district heating network. From this, Mainz customers are supplied with sufficient heat to supply around 40,000 modern single-family homes.”

The state-of-the-art plant operates with ten gas-fuelled Wärtsilä 34SG engines. The operational flexibility of the plant enables KMW to start and stop the engines within 2.5 minutes. This provides essential grid balancing support as the power system incorporates ever-increasing renewable sources, namely wind and solar. It also allows KMW to operate in the short-term balancing markets, since power output can be quickly adjusted to respond to fluctuations in the power demand, as dictated by the electricity price.

As part of its climate action plan, the German government has committed to increasing the share of electricity produced by CHP plants to 25% of the total electricity production by 2025. Germany, like the European Union, aims to become greenhouse gas neutral by 2050. It has set the preliminary target of cutting emissions by at least 55% by 2030 compared to 1990 levels. “This commencement of commercial operations for the Wärtsilä CHP plant provides us with a modern, agile, low-carbon system capable of utilizing green energy assets to the full. Fast acting power generation is essential in today’s energy markets and this plant meets all our requirements in this respect,” commented Jörg Höhler, CTO member-mgmt board, Kraftwerk Mainz-Wiesbaden AG.

Aerial image of Kraftwerk Mainz-Wiesbaden AG power plant in Mainz, Germany, delivered by Wärtsilä (©Wärtsilä Corporation).

UPM advances plans for next-generation bio refinery

UPM moves forward with biofuels growth plans and starts the basic engineering phase of a next-generation bio refinery. The potential bio refinery would have an annual capacity of 500,000 tonnes of high-quality renewable fuels including sustainable jet fuel. The products would significantly reduce the need for fossil transport and aviation, as well as replace fossil raw materials with renewable alternatives in chemicals and bioplastics.

“The planned bio refinery would scale up UPM’s successful biofuels business to a new level. At the same time, it would further improve long-term competitiveness and sustainability performance of UPM Biofuels by introducing several sustainable feedstocks and achieving uniquely high CO2 emission reduction compared to biofuels currently in the market,” says Jyrki Ovaska, chief technology officer of UPM. UPM’s solid wood biomass-based residues and side streams would play a substantial role in the feedstock pool. In addition, it would consist of sustainable liquid waste and residues raw materials. “UPM has exceptional expertise acquired over decades in biomass sourcing both in Finland and Central Europe thanks to our large-scale operations in the pulp, paper, timber and plywood businesses. We are also developing and testing innovative carbon farming concepts.”

UPM will now proceed with a detailed commercial and basic engineering study to define the business case, select the most innovative technology option and estimate the investment need. The technology concept includes the use of green hydrogen in the production process. During the study UPM will also review the operating environment primarily in two locations: Kotka, Finland and Rotterdam, the Netherlands. The estimated duration of this basic engineering phase is minimum 12 months. If all preparations are concluded successfully, UPM would initiate the company’s standard procedure of analysing and preparing an investment decision.

“THE UPM Alpinepaper Bio refinery, with annual capacity of 130,000 tonnes, has been a great example of creating a successful new business beyond pulps. Years of investment in R&D and innovation have paid off. This gives us confidence to plan the scaling up of this exciting business,” says Ovaska. More information: Mirja-Maija Santala, Manager, Marketing Communications, UPM Energy m: +358 400 793 827 e: mirja-maija.santala@upm.com

UPM’s Tier III Wärtsilä CHP plant provides us with uniquely high CO2 emission reduction compared to biofuels currently in the market. This plant meets all our requirements in this respect.”

“With this plant, we are proud to be supporting Germany’s ambitious transition to a green energy future with extensive use of renewables. Flexible engines are an ideal partner for renewables, and they help future-proof our customers’ investments by allowing them to participate in the volatile electricity markets,” added Pekka Tolonen, energy business director, Europe, Wärtsilä.

Wärtsilä supplied and built the plant on a full engineering, procurement and construction (EPC) contract. The scope also includes a comprehensive 15-year maintenance agreement that guarantees the plant’s availability and reliability. The services provided include on-site support and remote online monitoring conducted via Wärtsilä’s asset diagnostics and expert analyses. This ensures sufficient capacity at all times, especially during periods of high demand in winter.

More information: Mirja-Maija Santala, Manager, Marketing & Communications, UPM Energy m: +358 400 793 827 e: mirja-maija.santala@upm.com
REA publishes ‘green pathway’ to accelerate drive to net zero and provide thousands of new jobs

The Association for Renewable Energy and Clean Technology (REA), said: “The UK’s energy system is in the midst of the largest transformation for generations, moving towards the legally-binding 2050 Net Zero target for greenhouse gas emission reductions. The change required over the next three decades is on a par to that experienced during the industrial revolution; affecting people’s homes, businesses and the very fabric of the nation.

“Our Strategy offers government the pathway to net zero and economic recovery – it is now up to them to deliver it.”

Dr Nina Skorupska CBE, chief executive of the Association for Renewable Energy and Clean Technology, said: “The UK’s energy system is in the midst of the largest transformation for generations, moving towards the legally-binding 2050 Net Zero target for greenhouse gas emission reductions. The change required over the next three decades is on a par to that experienced during the industrial revolution; affecting people’s homes, businesses and the very fabric of the nation.

“The COP 26 on the horizon, the government has an opportunity to make a bold statement – this Strategy not only sets out several necessary and achievable targets, but it also provides the solutions to removing the barriers which could prevent those targets being met. It is now abundantly clear that the argument of an ‘either/or’ choice between tackling climate change and providing an economic boost is over.

Support for the renewable energy and clean technology sector will not only help the government reach its net zero ambitions, but it could deliver hundreds of thousands of new jobs and return billions of pounds worth of investment too.

“Our Strategy offers government the pathway to net zero and economic recovery – it is now up to them to deliver it.”

Stora Enso divests non-core forest holdings in southern Sweden

As part of its forest land optimisation, Stora Enso has signed an agreement to divest forest assets located in southern Sweden to the forestry fund Silvvestra Green Forest AB. The total area of forest land in the transaction is approximately 5,200 hectares. The selling price is approximately SEK 940 million (€90 million). The transaction is in line with Stora Enso’s policy of divesting non-core assets. The forest areas are located geographically far away from Stora Enso’s other forest lands, which limits the scale benefits. The forest land divestment has no impact on Stora Enso’s nearby Hylte Mill, which uses other wood supply sources for its production. The forest land corresponds to less than 0.5% of Stora Enso’s total forest land area in Sweden.

The cash consideration for the divestment is €90 million. Stora Enso will record a gain of approximately €70 million, based on the assets’ historical cost, in the Forest division’s operational EBIT for the first quarter of 2021. The gain under IFRS is expected to be approximately €30 million, being based on the estimated IFRS book value at the disposal date.

The transaction is expected to be closed during the first quarter of 2021. More information: Untilla Lilla, EVP, Communications t: +46 72 227 9228

Environmental permit granted to Metsä Fibre’s Kemi bioproduct mill

The Regional State Administrative Authority for Northern Finland has recently granted environmental and water supply permits to the Kemi bioproduct mill of Metsä Fibre, part of Metsä Group. The environmental permit defines the limit values for the emissions of the new mill.

The environmental permit has been received and now it will be analysed in more detail. According to current estimate it is possible to reach a decision on the investment to the Kemi bioproduct mill in early, 2021.

The planning of the bioproduct mill is based on a high degree of environmental, material and energy efficiency. Despite the clearly increased production, the new bioproduct mill would stay below the emission limits of the currently valid environmental permit for the existing Kemi pulp mill. The bioproduct mill would be built according to the Best Available Technology (BAT) principle and, in part, using even more advanced technology, for example, at the wastewater treatment plant and the sulphuric acid plant. The investment of the bioproduct mill would be €1.5 billion and the construction of the new mill would take approximately two and a half years.

The bioproduct mill would produce 1.5 million tonnes of softwood and hardwood pulp per year, as well as many other bioproducts. The mill would not use any fossil fuels, and its power self-sufficiency rate would be high, 25%. This would further strengthen Metsä Group’s position as a major electricity producer relying on renewable Finnish fuels.

More information: Anna-Liisa Pennanen Communications Manager Metsä Fibre t. +358 50 574 8071 e. anna-liisa.pennanen@metsagroup.com

RJM wins substantial portfolio of new work from Bionenergy Infrastructure Group

RJM International, has announced that it has secured a five year Technical Services Agreement (TSA) as well as two new Overfire Flue Gas Recirculation (OFGR) projects, at Energy Works Hull (EWH) and at Ince Bio-Power (IBP).

Both sites are owned by Bionenergy Infrastructure Group (BIG), one of the UK’s leading developers and operators of Biomass and Energy from Waste plants.

The TSA will enable RJM to offer an advanced level of technical and engineering support at EWH and IBP and to support BIG in its future growth plans.

During 2020, RJM has already been applying its specialist expertise at both EWH and IBP, including assisting EWH to be the first Advanced Gasification Technology EFA Welfare Facility to meet the requirements of the Contracts for Difference (CfD) scheme. (This is the government’s main mechanism for supporting low-carbon electricity generation.)

RJM has also provided replacement fuel feed systems at Hull which has enabled a significant and immediate benefit in operational performance.

Commenting on these new contracts, John Goldring, managing director of RJM said: “We very much look forward to continuing our collaboration and partnership with BIG. Achieving consistent, reliable performance with a highly variable input fuel is something the biomass and EFW sector faces every day and requires complex analysis and well thought through solutions; a core strength of RJM International.”

Andy Richardson, chief operating officer at BIG added: “RJM’s input into these two projects at Hull and Ince has been invaluable so far and we look forward to building on this successful relationship with the new Technical Services Agreement, which we entered into with RJM in December, 2020.”

More information: Anna-Liisa Pennanen Communications Manager Metsä Fibre t. +358 50 574 8071 e. anna-liisa.pennanen@metsagroup.com
Bridging the climate funding gap

Industry veterans launch first dedicated global renewable energy multi-manager platform to help tackle $300 billion per annum climate financing gap

Manager research and alternatives expert David Hunter has teamed up with renowned institutional CIO Wendy Mayall to co-found Renewity, the world’s first multi-manager platform devoted solely to investing in renewable energy on a global basis. Annual investment of around $300 billion in renewable energy is needed to meet the Paris Agreement target of limiting global temperature rises to 1.5°C by 2051. Hunter and Mayall believe that an absence of ‘scale and speed’ in accessing renewable energy opportunities is creating a capacity challenge that could impede efforts to address this shortfall.

In providing investors with access to a range of the best specialist renewable energy managers, deals and related opportunities, Renewity believes it would deliver capital faster, diversify opportunities, Renewity believes it can speed’ in accessing renewable energy solutions for investors.

“Investors today are looking for a one-stop-shop to access renewable energy options,” said Hunter. “However, the market is fragmented and many investors don’t have the ability to deploy the necessary levels of assets effectively or in a timely manner. Nor can investors wait for them to develop the capability to do so when the pace of change has been too slow to date.”

“A multi-manager approach, itself driven mainly by scale dynamics and offering greater speed in deployment than a single manager approach, is not only vital to help plug the renewable energy investment gap, it can also deliver the largest, widest and quickest social and environmental impact for investors and stakeholders.”

Hunter has teamed up with alternatives expert David Mayall of Hunter and Mayall, who, as Head of Research, brings 30 years’ experience in advising pension plans on fund and manager selection. He also has extensive expertise in renewables, having advised one of the earliest UK institutional renewable energy allocations in 2005. Also on the team is Ravi Nevile, whose role as COO of the business are, Stephan Breban, who, as Head of Research, brings 30 years’ experience in advising pension plans on fund and manager selection. He also has extensive expertise in renewables, having advised one of the earliest UK institutional renewable energy allocations in 2005. Also on the team is Ravi Nevile, whose role as COO of the business are, Stephan Breban, who, as Head of Research, brings 30 years’ experience in advising pension plans on fund and manager selection.

Two biogas upgrading plants from Wärtsilä to support Denmark’s fossil-free ambitions

The technology group Wärtsilä will supply two large-scale biogas upgrading plants to different locations in Denmark. The orders were placed by Nature Energy, the world’s leading renewable biomethane company. By injecting biomethane, the end product of upgraded biogas, to the grid, Denmark will be taking an important step towards its stated ambition of becoming a climate neutral and fossil-free nation. The agreement with Wärtsilä dates back to early 2019, but the project was delayed because of permit applications. Production of the upgrading unit in striker will begin in the fourth quarter of 2020, when the orders were also included in Wärtsilä’s order book.

Biogas is produced primarily from waste products, such as manure and food waste. When upgraded to biomethane, it can be utilised in the same way as natural gas for heat, powering industrial processes, and as transport fuel. It is a renewable energy solution since the remaining digestate can be sold as bio-fertiliser.

Currently biomethane accounts for approximately 20% of Denmark’s gas consumption, and the aim is for the grid to become totally green by 2035. The plants will be located on Fjernvarme Fyn’s existing combined heat and power plant site in Odense, on the island of Funen in Denmark, some 75km west of the capital Copenhagen. This new plant will supply district heat to the Odense area and is also prepared for electricity production at a later stage.

The Bio-Blok 2 project is an important part of Fjernvarme Fyn’s goal of abandoning the use of coal at their combined heat and power plants by 2022, and contributing to the national objective of a 70% reduction in CO2 emissions by 2030. Fjernvarme delivers about 97% of the district heat requirement in Odense, providing heat for more than 100,000 households and large greenhouses.

Wärtsilä’s solutions include a biomass-fired boiler with flue gas cleaning and a flue gas condenser with absorption heat pump technology. Based on the ANDritz EcoFluid bubbling fluidised bed design, the boiler combines high-efficiency with excellent environmental performance. The flue gas condenser with heat pump technology after the boiler significantly increases the district heat output and, therefore, improves the plant efficiency.

The new plant will be fuelled by wood chips as the main fuel and wood and/or sugar cane pellets as secondary fuel. The plant is capable of providing close to 180MW of heat, to the district heating network and reaching record efficiency of almost 120%.

This order from Fjernvarme Fyn once again demonstrates ANDritz’s strong global position in the supply of state-of-the-art and environmentally-friendly biomass boilers. More information: Dr. Michael Buchbauer, Head of Corporate Communications Andritz AG, michael.buchbauer@andritz.com andritz.com

ANDritz to supply biomass boiler plant to Fjernvarme Fyn Produktion A/S in Odense, Denmark

International technology Group ANDritz has received an order from the Danish energy company Fjernvarme Fyn Produktion A/S to deliver a new biomass boiler plant complete with auxiliary equipment for their ‘Bio-Blok 2’ project. The plant will be located on Fjernvarme Fyn’s existing combined heat and power plant site in Odense, on the island of Funen in Denmark, some 75km west of the capital, Copenhagen. This new plant will supply district heat to the Odense area and is also prepared for electricity production at a later stage.

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Australian firm partners with French giant to reduce carbon emissions in Japan

A company from Adelaide, South Australia is partnering with one of the world's biggest energy utilities to provide renewable wood pellets for the Japanese electricity market.

International Bio-Fuel Marketing (IBFM) has entered into contracts with French energy giant Engie to build four wood pellet plants in Asia with construction starting this year.

The joint venture, which has established a Singapore-based company called Consolidated Biomass, plans to begin construction of the first plant in Vietnam in September. Work on a second plant is scheduled to begin in early 2022, with the construction of two more plants in Malaysia to start from late next year.

Each plant will cost about $12 million, take 12 months to build and be capable of producing 70,000 tonnes of wood pellets a year.

The majority of waste wood used as feedstock will be offsets and byproducts from Forest Stewardship Council (FSC) approved plantation rubberwood, after the trunks of the tropical hardwood have been sold off for lumber and furniture manufacturing.

Wood pellets are used for firing with coal at power plants, helping after the trunks of the tropical rubberwood, wood pellets a year.

Malaysia to start from late next year. to begin in early 2022, with the first plant in Vietnam in September.

Consolidated Biomass wood pellet plants will involve an eight-step end-to-end process that begins with the arrival of the waste wood through to the delivery of the manufactured pellets to Engie at the port.

He said the contracts with Engie included a long-term off-take agreement, which had a value of $800 million across the four plants.

“Our agreement is for 15 years and what that says is for every tonne that we produce from our plants it’s already sold for the next 15 years at a fixed price with an escalator,” Wilks said.

“They’ve selected us because we’ve got our foot on the ground in Vietnam and we went there early.

“They need to get close to Japan for the timber delivery of a district heating plant in Espbjerg, Denmark.

The combined capacity of the Unicon Renvex bubbling fluidised bed (BFB) and the Unicon Condenser fluid gas scrubber will be 6 MW. The boiler plant will produce heat for the local district heating network for nearly 100,000 inhabitants and will use wood chips as fuel. The plant will start its operation in January, 2023.

The boiler plant will be located in the port area of Esbjerg. The plant delivered by KPA Unicon is a significant part of a bigger plan, where three decentralised heat production units are planned to be constructed to the same site for the purpose of replacing the existing coal-fired power plant.

“IBFM is a privately-owned company with five shareholders, but it is looking for new investors to come onboard to inject about $15 million into the business so it can employ more staff to fast-track the Engie project.

“IT will also allow it to look at new projects with other potential partners.

“IT will give us more resources – we’ve got a guy in Holland who is an expert in that area, he is the one we want to bring him out here to oversee the commissioning and maintenance of that equipment alongside the manufacturing,” Wilks said.

“The sooner we can engage people like that the quicker we can move.

“We’ve got all of these opportunities but we are a little bit hamstring when it comes to using our own funds to do that. We try by no means break out a big engineering company to design and manufacture the equipment alongside the manufacturer,” Wilks said.

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“We’ve got all of these opportunities but we are a little bit hamstring when it comes to using our own funds to do that. We try by no means break out a big engineering company to design and manufacture the equipment alongside the manufacturer,” Wilks said.
Austrian biomass report released

Nature conservation and energy transition can go hand-in-hand. This is shown in the new report ‘Energy Transition & the Use of Biomass’ which was created as a part of the LE 14-20 project BÖKONAT – Biomass in the context of a nature-compatible energy transitions: role, opportunities and options. The project was sponsored by the Federal Ministry for Agriculture, Regions, and Tourism and the European Union, led by the Umweltbundesverband (an environmental umbrella organisation) and accomplished together with its cooperation partners Environment Management Austria (UMA), Austrian Biomass Association (ABA) and Forum Science & Environment (FINU).

The publication presents common solutions for a nature-compatible use of the Austrian forest biomass potential.

Forest biomass is of outstanding importance among the renewable energy sources in Austria due to its quantitative use and the existing expansion potential. Therefore, the joint project of the ABA and the environmental associations focused on the role of the forest as a resource for its material and energetic use, including its functions for climate protection and nature conservation. The best practice examples from the forestry operation Altenburg Abbey and the Rastenfeld wood power plant located in the Waldviertel effectively demonstrate, how an exemplary interaction between forest management and nature conservation can contribute to the success of the energy transition.

The report is only available digitally and can be downloaded from the following link: https://www.biomassevenverband.at/wp-content/uploads/FOREST-BÖKONAT_english.pdf

Demag will supply three cranes to major combined heat and power plant

Demag will supply three process cranes equipped with grabs for an ambitious project to serve a major combined heat and power plant.

The order has been placed by Green Steam Hürth GmbH, a subsidiary of E.ON, which will build a biomass power plant with an output of 20MW of electricity and 87MW of heat energy at the site of the UPM paper plant in Hürth near Cologne, Germany. This project sees the first use of Demag Remote Operating Stations, which enable the remote control of crane systems.

The power plant, where E.ON is due to go online in mid 2022, will provide heat for the Hürth paper factory and, at the same time, feed renewable energy into the grid. UPM produces more than 100,000 tonnes of high-quality newspaper made from recycled paper at the factory every year.

The location has been well selected, because the paper production operation needs a lot of heat (in the form of steam) and combined heat and power generation is particularly efficient. In this case, it is also particularly sustainable, since the power plant is fuelled by wood residues, which E.ON procures in the region. According to E.ON, this will provide an efficient and reliable supply of virtually CO2-neutral energy to an industrial operation that requires a lot of energy.

Demag will deliver two process cranes for the automated continuous supply of wood to fire the boiler in the power plant. Some 45 tons of wood need to be fed around the clock every hour. The two double-girder cranes, which have a load capacity of 14 tonnes and a span of 20.6 meters, will travel on a crane runway measuring almost 100 metres in length. All of the crane travel drives feature variable speeds; energy recovery when braking and lowering loads enhances the energy efficiency of the cranes. Hydraulic multi-jaw grabs with a capacity of 12m³ will be used to load handling attachments.

Cranes continuously feeding fuel

The crane systems will largely operate in automatic mode. The Demag Warehouse Management System (WMS) software will ensure, for example, that the bunkers are cleared, that the boiler is continuously fed with the required quantities of wood and that both cranes complete their co-ordinated tasks.

Not only the fuel, but also the ash as a residual material is handled by a Demag crane. The Demag engineers have specified a smaller double-girder process crane with a 5.4 tonne load capacity and a hydraulic grab for this task.

The three crane systems will operate under challenging conditions with high-humidity (up to 100%) and high-dust levels. They are ideally suited to meet these requirements, as Demag has already designed and delivered many cranes for refuse recycling installations and biomass power plants all over the world.

Demag ROS: crane control system with multiple views of the operating location

Since it is very difficult to view the entire very long fuel bunker from a conventional crane cab, the project engineers at E.ON decided in favour of a special Demag option. If the cranes need to be operated under classic manual control, this can be done via a Remote Operation Station (ROS), which also serves as a monitoring station when the cranes are running in automatic mode.

ROS is a remote control station that includes all operating functions of a process crane with a crane operator seat – except that the operator does not view the crane and its operating environment directly, but via a widescreen monitor that shows images from several cameras in real time. The screen layout can be configured to meet process requirements, with information relevant to the process being automatically displayed. In theory, a station like this can be located very far from the crane. At the Hürth biomass power plant, it is installed in the control centre, so the operator can benefit from improved working conditions.

Thanks to the many installed cameras, the operator has an even better view of the process than usually available from a crane cab. This is because the cameras can also ‘look’ where the normal field of vision would be restricted.

More information

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Demag Marketing
Tel. 02335 92 3907
Nova Pangaea Technologies reaches operational milestone and looks to expand

Nova Pangaea Technologies, the Redcar-based cleantech company, has reached a significant milestone in the technological validation of its first of a kind process to sustainably convert forestry and agricultural residues into sustainable biochemicals and biopolymers and drop-in products for advanced biofuels.

The company received a £4.6m grant from the Department of Transport in 2015 through the Advanced Biofuels Demonstration Competition (ABDC) and following construction of the plant has now achieved 100 hours of operation on its proprietary SARP (steam assisted rapid pyrolysis) technology, in addition to a continuous 24-hour operation in February.

CEO Sarah Ellerby said: “SARP is our proprietary technology and phase three of the REFNOVA process. This demonstrates the robustness of our technology which we will now accelerate on to modular design for scale and customer delivery. SARP produces valuable sugars for downstream product outputs for advanced biofuels and its lignin converts to biocarbons such as biochar.”

Simon Crabtree from the Northern Powerhouse Investment Fund said: “This is a significant milestone for the company. They have demonstrated that the technology is robust, reliable and economically feasible without gate fees. The Northern Powerhouse is proud to be part of the syndicate that is taking this step change technology forwards.”

Sarah continues: “With the validation of our technology and the recent breakthrough, we are seeing significant global interest. Since January, 2020, we have increased our headcount by 45% and continue to expand the operations and engineering team. We are fortunate to be based in a fast-growing area of the UK with excellent access to the people, skills and technology we need.”

Transport Minister Rachel Maclean said: “The role that SMEs play in the development of the low carbon fuel sector is vital on our road to building back better. This is why I’m delighted to see that government funding is supporting clean tech start-ups such as this one to flourish, as we take the all-important steps needed to decarbonise transport.”

If you’re interested in learning more about our proprietary patented process, REFNOVA®, and our services, please call on 01642 6440928, write to us at: Nova Pangaea Technologies (UK) Ltd, Lealholme Building, Wilton International, Wilton, Redcar, TS10 4RG

About Nova Pangaea Technologies Ltd
Nova Pangaea Technologies converts forestry and agricultural residues into biochemicals, biopolymers and drop-in products for advanced biofuels. The REFNOVA technology is a British invented, world first; the company is based in Redcar, near Teeside, and trades with customers worldwide. The REFNOVA technology converts plant residues such as soft and hard woody residues, wheat straw and sugarcane bagasse into sustainable biochemicals, biopolymers and drop-in for advanced biofuels, providing additional yield and revenue streams for producers while reducing dependence on fossil fuels and feedstocks that compete with food applications. https://www.novapangaea.com/
Fast-Track energy transitions to win the race to zero

World Energy Transitions Outlook outlines global strategies towards carbon-neutrality and leads way to a climate-safe 1.5°C pathway by 2050

Proven technologies for a net-zero energy system already largely exist today, finds the preview of World Energy Transitions Outlook by the International Renewable Energy Agency (IRENA). Renewable power, green hydrogen, and modern bioenergy will dominate the world of energy of the future.

Previewed at the Berlin Energy Transition Dialogue today, IRENA’s Outlook proposes energy transition solutions for the narrow pathway available to contain the rise of temperature to 1.5°C and halt irreversible global warming. 90% of all decarbonisation solutions in 2050 will involve renewable energy through direct supply of low-cost power, efficiency, renewable-powered electrification in end-use as well as green hydrogen. Carbon capture and removal technologies in combination with bioenergy will deliver the ‘last mile’ CO2 reductions towards a net-zero energy system.

With 2030 deadlines around the corner, this Outlook comes at a critical time when acting fast and bold on global climate pledges is crucial in the decisive year of UN High-Level Dialogue on Energy and Glasgow Climate Conference COP26.

Francesco La Camera, Director-General of IRENA said: “The window of opportunity to achieve the 1.5°C Paris Agreement goal is closing fast. The recent trends show that the gap between where we are and where we should be is not decreasing but widening. We are heading in the wrong direction. The World Energy Transitions Outlook considers options of the narrow pathway we have to be in line with the 1.5°C goal. We need a drastic acceleration of energy transitions to make a meaningful turnaround. Time will be the most important variable to measure our efforts.”

“While the pathway is daunting, several favourable elements can make it achievable,” La Camera added. “Major economies accounting for over half of global CO2 emissions are turning carbon neutral. Global capital is moving too. We see financial markets and investors shifting capital into sustainable assets. Covid-19 has highlighted the cost of tying economies to fossil fuels and confirmed the resilience of renewable energy. As governments pump huge sums in bailouts and recovery, investment must support energy transition. It is time to act and countries can lead the way with policies for a climate-safe, prosperous and just energy system fit for the 21st century.”

IRENA’s 1.5°C pathway uses a tracking of global power dominated by renewables in 2050. It also sees a decline in fossil fuel use by more than 75% over the same period, with oil and coal consumption shrinking fastest. Natural gas should peak around 2025, becoming the largest remaining fossil fuel by 2050. Financial markets reflect this shift by allocating capital away from fossil fuels and into sustainable assets like renewables. The downgrading of fossil fuels continues, with shares of fossil-fuel-heavy energy sector in S&P index falling from 17% a decade ago to below 3% today. In contrast, investors are flooding money into renewable energy stock with S&P clean energy up by 138% in 2020. However, significant investment will have to be redirected. IRENA’s Outlook shows. Major economies have announced economic stimulus packages that will pump approximately $4.6 trillion directly into carbon-relevant sectors such as agriculture, industry, waste, energy and transport, but less than $1.8 trillion is green.

By contrast, energy transition investment will have to increase by 30% over planned investment to a total of $11 trillion between now and 2050, corresponding to $4.4 trillion on average every year. Socioeconomic benefits will be massive, investing in transition will create close to three times more jobs than fossil fuels, for each million dollars of spending. To address concerns about a fair and just transition, IRENA’s Outlook calls for a holistic and consistent overall policy framework.

IRENA’s 1.5°C pathway sees electricity becoming the main energy carrier in 2050 with renewable power capacity expanding more than ten-fold over the same period. Transport will see the highest growth of electrification with a 30-fold increase. Almost 70% of carbon emissions reductions in transport will come from direct and indirect electrification.

Green hydrogen will emerge as one of the major demands for electricity, representing 30% of total consumption in 2050. Bioenergy combined with carbon removal technologies (BECCS) will increasingly be important for industry to bring negative emissions in face of a limited carbon budget for 1.5°C.

Read the preview of World Energy Transitions Outlook. The preview will be followed by the full report, outlining socio-economic footprint for the transition along with market and finance insights.

Waste to Energy giants given greenlight for planning permission of £300 Million Teesside Project

Two of the UK’s leading waste to energy companies – Low Carbon Ltd and PMAC Energy – have recently announced that planning consent has been granted for a new £300 million state-of-the-art waste to energy centre on the site of the former Corus Steel works.

The Redcar Energy Centre, which is set for completion in 2025, forms a cornerstone development for the UK’s largest industrial zone as part of the South Tees Development Corporation’s ambitious redevelopement objectives to provide heat and electricity to advanced manufacturing facilities and residential properties in the local area.

And with the site providing excellent road, rail and port facilities to both the UK and European waste markets, it is expected to divert between 350,000 and 400,000 tons of refuse derived fuels per annum away from UK landfill, generate enough energy to power over 100,000 homes and deliver more than £300 million of inward investment to the region.

This will include the employment of over 400 local and highly skilled workers during its 36-month construction phase with the availability of over 105 full-time operational jobs.

In line with its ambitions to be a greener, more efficient and lower cost solution to landfill and export and in partnership with the Net Zero Teesside Carbon Capture project located adjacent to the site – the plant is committed to zero emission energy from waste.

Speaking about the project, Rob Lewis, MD at PMAC Energy said: “Redcar is the perfect site for the location of this plant. It has always been a long-term goal of PMAC Energy to develop a large-scale sustainable Energy from Waste recovery centre in the North-East and we are thrilled to have the support of Low Carbon in developing the Redcar Energy Centre. Using our extensive experience, we have designed a smart, flexible solution for both waste management and energy recovery to support the expanding list of future developments in neighbouring areas.”

Occupying a 25 acre site within Redcar Bulk Transport, and alongside the River Tees, the Redcar Energy Centre is a joint venture between Low Carbon and PMAC Energy, both of which are vastly experienced in delivering waste to energy schemes, with Low Carbon having six assets currently in development across the UK and Europe.

Roy Bedlow, Founder and Chief Executive of Low Carbon added: “The £499m subsidy-free Redcar Energy Centre will use proven conventional technology to provide a reliable source of controllable energy for more than 100,000 homes. Not only this but it adds flexibility to the fuel and recycling supply chains and provides hundreds of jobs to an area with a proud industrial heritage.

“Low Carbon is delighted to bring forward our third consented waste project in the UK and to use our experience in developing large-scale renewable and low-carbon energy projects to help deliver this project in the Tees Valley.”

As part of the partnership’s continued effort to communicate with local residents and stakeholders, Low Carbon and PMAC Energy has launched a website where further information on the project is available, including frequently asked questions and stakeholder communication.

This is available at http://redcarenergy.com.

More information: Jane Gatiss
Scarab
07540 786 836
jane.gatiss@scarab4.com

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New Harvester Head models H423, H425 and H425HD

The H423 harvester head has been designed for thinnings and small-size trees. The more robust H424 and H425HD harvester heads are designed for final fellings and big trees. The new harvester head models replace the previous H423, H424 and H425HD models.

A firm grip, four-wheel feed and high-performance delimbing ensure high productivity. Feeding is efficient and fast, thanks to the harvester head’s unique four-wheel drive and the mechanical locking of the differential. The changes made based on customer feedback improve ease of use, durability, performance, and economy. Customers are impressed with the robust structure, increased durability, carefully routed hoses, and easy access to service points of the new harvester head models.

The PEVO valve improves the harvester head’s performance, adjustability, and economy compared to the predecessor model. Improved hose routing from the boom to the harvester head and from the valve block to feed motors improves hose durability. The new, hinged valve block to feed motors improves hose routing from the boom to the harvester head, and from the valve block to the feed motors, improving hose durability. The new, hinged valve block cover makes daily maintenance easy. Grease points and the saw chain oil tank are also easier to access, and the greasing interval is longer than before. Also these models are equipped with the new Super Cut 1005 saw unit. John Deere harvester heads are high-performance tools that meet the industry’s stringent quality requirements in all working conditions. Harvester head testing is part of John Deere’s product testing process. Each harvester head model has been field-tested for thousands of hours before the start of serial production. John Deere harvester heads are designed and manufactured in Finland.

H423 harvester head
- First thinning, thinnings and early regeneration felling
- Maximum cutting diameter 580mm
- Maximum opening of feed rollers 500mm. Ideal for thinnings and other fellings where the tree diameter at chest height is 155-355mm
- Feeding force 27kN
- Maximum feeding speed 4.3 – 5.31/min
- Weight starting at 955 kg
- Base machines 1070G, 1170G, 1270G

H425 harvester head
- Maximum cutting diameter 730mm
- Maximum opening of feed rollers 630mm. Ideal for final and other fellings where the tree diameter at chest height is 250-500mm
- Feeding force 32kN
- Maximum feeding speed 2.9 – 7.0/min
- Weight starting at 1300kg
- Base machines 1270G, 1470G

The H425HD harvester head model has the following features:
- Feed motor guards
- HD hit handle
- Expander pins in the upper tilt cylinder, feed motor arms, and lower delimbing knives
- Weight: 1391kg

The new Super Cut 1005 saw unit for all John Deere harvester heads. In 2020, all John Deere harvester heads will have the new Super Cut 1005 saw unit.

The saw unit’s next-generation chain tensioning unit, automatic chain tensioning, and mechanical bar locking give it added efficiency and reliability. The improved chain release makes it easier to replace the saw chain. The new saw unit enables also a bigger selection in terms of saw motors and saw bars.

Further information: Elina Suurinen Communications Specialist John Deere Forestry Oy t. +358 400 466 476 SuurinenElna@JohnDeere.com

Intelligent boom control now available for 1070G harvesters

A milestone in forest machine technology, John Deere’s Intelligent Boom Control (IBC), is now available for all John Deere WCTL forest machines. IBC was launched for forwarders in 2013. It was introduced for harvesters in 2017 initially for the 1270G and 1170G models. IBC was available for the biggest harvester model, the 1470G, earlier in 2020, and it will now be available also for the smaller 1070G harvester.

Precise and smooth work with IBC
A boom equipped with intelligent boom control is fast, easy to use and precise. IBC is a unique boom control system developed by John Deere. The sensors in the intelligent control system read the harvester head’s position, and the algorithms adjust the boom’s trajectory to achieve easily controlled motion. IBC also functions as a platform on which we can introduce new functionalities that facilitate the work.

In harvester operations, IBC is designed to suit the machine’s work cycle. The trajectory and function of the boom automatically adjust as the boom is taken to a tree and when the tree is in the grapple. The operator doesn’t have to activate the different sections of the boom individually. IBC ensures precise operation and efficient work practices. The boom’s electronic end dampening makes the work process pleasant and smooth, and reduces stress on the entire boom. IBC improves work ergonomics and guides the operator in the correct use of the boom, which is directly reflected in the increased productivity of the machine and in the everyday working capacity of the operators.

1070G, IBC and the new H212 harvester head
The agile 1070G equipped with the new, narrow and light H212 harvester head is an ideal combination for first thinnings. The advantages of IBC in thinning work are unbeatable. Precise and controlled movements and grabbing trees, a frequent matter in thinning work, are emphasized in first thinnings and in bundle-handling. The dimensions of the H212 harvester head bring agility to thinning work, making it easy to move around in even small thinnings. Delimbing has been optimised especially for smaller trees, enabling a very high-quality delimbing result. Thanks to the narrow frame of the H212 harvester head, visibility to the stem is excellent. The location and the high-speed cutting of the saw increases productivity and minimises cutting damage. And it has the power and feeding speed to handle bigger trees if needed. The H212 harvester head is available for John Deere 1070G and 1170G harvesters.

WSM Wood and Bark Hogs grinding machines

Process a wide range of feedstock at rates up to 150 tons per hour with the highly effective yet simple design of WSM Wood and Bark Hogs. These rugged grinders feature a heavy-duty rotor with innovative disc and hammer configuration options that make WSM grinders the most efficient on the market. The self-cleaning housing provides easy access to main wear components with all infeed housing provides better sound insulation, making the cabin an even quieter working environment. The unique WSM system is integrated into all the latest models that have a rotating and levelling cabin or a fixed cabin.

Convert large diameter stumps, round wood, branches, storm debris, land clearing, and other wood residuals into biomass feedstock.

WSM’s S472 Titan Horizontal Grinding System processes rubberwood and wood stumps at rates up to 50 metric tons per hour to an approximate 4"-6" minus biomass feedstock.

The Titan Grinding System starts with our heavy-duty Chain Infeed Conveyor to meter the material to the Powered Feeder. The 40" diameter pivoting Powered Feeder provides superior climbing ability to feed material to the Titan Horizontal Grinder.

The massive Titan Grinder’s 54" diameter x 72" wide rotor assembly includes hammers that weigh 195 lbs each and replaceable tips. The pivoting grinding housing allows for easy maintenance access to the rotor and screens.

Converting stumps to biomass feedstock is one way we help our customers turn waste to profit. Contact us for more information on the Titan Horizontal Grinding System and learn how it might benefit your operation. 503-364-2213 www.westaim.com or info@westaim.com

New durable windows compliant with ISO 21876 Saw Chain Shot Testing standards for forest machines

In September, 2020, ISO 21876 was published. The new standard defines the requirements for the windows of harvesters, which are at risk of being hit with a broken saw chain or its parts.

Since March, 2020, all John Deere forest machines have been equipped with windows fulfilling the requirements of this new standard.

The new RENCRAFT® Super Hard Coat (ECE 43R LEVEL L) polycarbonate windows are more durable. The stretch resistance of the windows and their ability to withstand chemicals and cleaning solutions is significantly improved.

The front window of the rotating cabin and the rear window of the forwader’s fixed cabin are now almost 50% thicker than before. Also the front window of the fixed cabin is thicker than before. The thicker material provides better sound insulation, making the cabin an even quieter working environment. The windows will be retrofitted to all the latest models that have a rotating and levelling cabin or a fixed cabin.
Text Marjaana Lehtinen

Back in 2007, Eneco, a leading Dutch utility company, was the first energy company in its operating area to choose a sustainable strategy. Over the years, it has become a leader in energy transition and one of the biggest investors in sustainable energy.

One of the company’s major investments is the Eneco Bio Golden Raand biomass plant, located in Delfzijl and supplied by Valmet. It has played a key role in enhancing the sustainability of Eneco’s energy supply since 2013. The plant produces sustainable electricity for 120,000 households and AkzoNobel Industrial Chemicals. It also supplies steam to Nouryon Chemicals. Both are industrial customers in its vicinity. Thanks to biomass utilisation, the amount of CO2 emissions from energy production has been reduced by some 250,000 tonnes annually.

Valmet’s delivery included a 49 MWe biomass-fired boiler plant, a flue gas cleaning plant and stack, a feedwater system and a Valmet DNA automation system. The boiler utilises circulating fluidized bed (CFB) technology and runs completely on recycled wood chips. The steam parameters are 127MWth, 5 kg/s, 90bar and 520°C.

“We chose Valmet’s technology for our plant based on how Valmet presented themselves as a company, their knowledge and proven reliability in other projects,” says Marc Wegman, Director Industrial Assets at Eneco.

Fuel issues removed together

Not long after the start-up, ensuring the quality of recycled wood chips proved far more challenging with regard to combustion than had been expected.

“We faced some issues with the fuel and particularly with the chemicals, mainly chlorine, in the waste wood. This had a major impact on the wear and tear of the boiler parts, and especially on the superheaters. Valmet helped us choose better materials and protect parts within the boiler to prevent any damage. This made it possible to extend the time between outages,” Wegman explains.

In addition to the boiler modifications, Valmet has helped the plant measure fuel quality, and optimally tune and operate the process. For example, to optimise the combustion temperatures with the varying fuel quality, Valmet combines process expertise with analytical tools. Big data analyses are being used to monitor our fuel and ensure that we won’t cross the lines of the fuel’s maximum chemical content threshold in the fuel,” adds Wegman.

Regular performance evaluation with analytical tools is part of the Valmet Industrial Internet (VII) offering, which has been developed to optimise process operations based on vast monitoring data.

No surprises – thanks to a service agreement

According to the service agreement between Eneco and Valmet, the latter carries out all boiler maintenance work at the plant. All actions are planned well ahead for a one- or two-year period, so no nasty surprises lurk in the process.

Wegman continues: “The biggest benefits of the service agreement include the knowledge levels of Valmet personnel and the speed with which they can respond if any issues occur. I’m impressed by Valmet’s expertise and their communication with us.”

Co-operation has proved to work well; despite the difficult fuel, plant performance has been excellent. During the past four years, there have been very few unplanned shutdowns.

“Since we solved the fuel quality issue together, plant reliability and availability have been very high. Since 2017, when we started delivering steam, plant efficiency has been higher than expected,” Wegman remarks.
Reducing Fire Risk

How can you reduce fire risks in forestry?

Highly combustible materials, such as wood, sawdust and dry vegetation, create a wide range of fire risks. As such, for those working in forestry, the risk of fire is substantially high.

James Mountain, sales and marketing director, Fire Shield Systems Ltd, explores the prominent fire risks within the forestry industry and discusses his tips for reducing these fire risks effectively.

In forestry, the key material for sustained business operations creates multiple fire risks. Wood is a highly flammable material, so having the right fire protection measures in place is crucial to reduce its risks and protect your business’ valuable assets, teams and its surrounding environment.

As fires within the industry become all the more frequent, the importance of fire safety remains prevalent. So, what are the key risks and how can businesses mitigate them effectively?

The fire risks

- **Harsh environment**
  The forestry industry is largely based outside, meaning it’s often subject to harsh weather conditions. Strong winds and high temperatures increase the risk of fire and the two weather conditions can be a harmful combination for the ignition and spread of fire.

  **How can you reduce the risks?**
  1. **Create a forest management plan**
     The Forestry Commission discusses how to create a forest management plan to mitigate fire risk. Your plan should detail the objectives you are hoping to achieve, for example, “to decrease the number of fire incidents over a certain period of time”, the prominent risks within the facility, fuel sources and details of who may be at risk in the event of a fire.
     A forest management plan can help you to identify all possible risks, allowing you to introduce the appropriate measures to actively reduce these.
  2. **Regular maintenance of equipment**
     Issues can be identified and resolved quickly through regular maintenance. If left unmonitored, certain issues may result in overheating, which can act as an ignition source.
     Additionally, as forestry operations often result in the build-up of dust in machinery, regular cleaning of equipment can help to ensure that any dust is removed, reducing its associated fire risks.
  3. **Manage vegetation**
     Any vegetation should be controlled to prevent fuel build-up. This should involve creating a pattern in vegetation to reduce fire risk and allow for easy extinguishing of fire.
     Fire breaks and belts should be designed to form an interconnected network, surrounding particularly high-risk areas of woodland. They can be positioned at critical points to prevent extreme fire spreading or created adjacent to other fire-resistant features, such as rivers or wetlands.
  4. **Create fire breaks and fire belts**
     Fire breaks and belts can act as protective barriers to stop or slow the spread of a fire. Fire breaks are gaps in vegetation, or other combustible materials, while fire belts are strips of woodland, made from fire-resistant species. Both aim to reduce fire spread.
     Fire breaks and belts are gaps in vegetation, or other combustible materials, while fire belts are strips of woodland, made from fire-resistant species. Both aim to reduce fire spread.

James Mountain.

- **Vehicles**
  The industry largely relies on vehicles and machinery for its continued operations. Often, these vehicles will store and carry vast amounts of flammable oils and fuels, which can ignite any surrounding combustible materials if not managed carefully.

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  4. **Create fire breaks and fire belts**
     Fire breaks and belts can act as protective barriers to stop or slow the spread of a fire. Fire breaks are gaps in vegetation, or other combustible materials, while fire belts are strips of woodland, made from fire-resistant species. Both aim to reduce fire spread.
     Fire breaks and belts are gaps in vegetation, or other combustible materials, while fire belts are strips of woodland, made from fire-resistant species. Both aim to reduce fire spread.

For new forests and woodlands, or when restructuring an existing forest, fire risks can be controlled by planting fire-resilient vegetation to enhance the effectiveness of fire breaks or the belts.

The Forestry Commission discusses how to create a forest management plan to mitigate fire risk. Your plan should detail the objectives you are hoping to achieve, for example, “to decrease the number of fire incidents over a certain period of time”, the prominent risks within the facility, fuel sources and details of who may be at risk in the event of a fire.

A forest management plan can help you to identify all possible risks, allowing you to introduce the appropriate measures to actively reduce these.

Equipment can help to ensure that any dust is removed, reducing its associated fire risks.

Issues can be identified and resolved quickly through regular maintenance. If left unmonitored, certain issues may result in overheating, which can act as an ignition source.

Any vegetation should be controlled to prevent fuel build-up. This should involve creating a pattern in vegetation to reduce fire risk and allow for easy extinguishing of fire.

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