

# THE PASSAGE OF THE BULLS

## UPM's Giant Pulp Mill in Uruguay Ramps Up

UPM's Paso de los Toros pulp mill started up in central Uruguay in 2023 and is now in the process of ramping up to its design capacity of 2.1 million tonnes a year. ANDRITZ was chosen once again as the turnkey supplier after the positive experience with its technology at UPM's first mill in the country, Fray Bentos, which started up 16 years ago.

UPM's Paso de los Toros, translates to "Passage of the Bulls" in English, and you can clearly see why; the approach to the mill traverses through cattle ranching country, with its undulating hills and ample waterways. There are even occasional groups of gauchos to be seen here, working their horses to round up the cattle that can be seen dotted all over the landscape and right up to the mill fence.

Strangely, the modern, glistening giant of the Paso de los Toros mill doesn't seem out of place here as

it quietly and efficiently churns out 2.1 million t/y of the highest quality eucalyptus pulp used for various paper and board grades at the same time as producing around 1 TWh of surplus renewable electricity to the national grid.

### STABILITY AND SUSTAINABILITY – TOP OF THE LIST FOR UPM AND URUGUAY

Uruguay has proven to be an excellent country in which to operate pulp mills since the state decided to establish a forest industry in the country. Marcos Battezzore, Vice President of UPM's Pulp

and Forestry Operations in Uruguay, says, "This country has served as an excellent platform for UPM and the development of sustainable eucalyptus plantations. The government implemented a forestry law in 1987 that firmly placed the sector as an important economic powerhouse and is committed to ongoing support and development. Uruguay is also stable politically and economically; in fact, the country rates as No.1 on the stability indexes in the region."

The Uruguayan government is also achieving distinction on the environmental front with 98% of its energy coming from renewable sources.

Battezzore continues, "The environment and sustainable development are also top of the list for us at UPM. Care for the environment goes across all our operations from raw material supply to operational excellence at both our mills, Fray Bentos and the new Paso de los Toros facility."

"Right from the outset since UPM first started its plantations in Uruguay in the early 90s, we have paid special attention to sustainable development and maintaining biodiversity. In fact, 60% of the land we use for our plantations; the rest is set aside for biodiversity and encouraging natural growth, as well as supporting local infrastructure and communities."

The environmental focus also extends to the production facilities at its mills as Battezzore explains, "We have now had 16 years of full operation at our Fray Bentos mill, which was also delivered by ANDRITZ. In that time, we have gained huge experience in the running and maintaining of a large pulp mill, at the same time as achieving top environmental performance."

"The positive Fray Bentos experience paved the way for this latest project, which is why we once again chose ANDRITZ technology, service, and experience for the Paso de los Toros mill."

### COMBINED EFFORT: CLOSE TEAMWORK BETWEEN UPM AND ANDRITZ

UPM announced its investment decision to build the new mill in July 2019 with ANDRITZ starting work at the site in December 2020. Around 250 ANDRITZ employees at site were involved in the capital delivery and maintenance contracts. The investment of 3.5 billion USD in the project in Uruguay represents the largest foreign investment the country has ever seen at the time it was announced. The investment also includes a new pulp terminal in the port of Montevideo and local facilities. Start-up of the pulp mill took place in April 2023.



Due to the experience already gained at the Fray Bentos mill, UPM and ANDRITZ worked intensely together as a team on the design of the new Paso de los Toros mill. This included the expert UPM process island managers of Fray Bentos travelling to Finland with their families for around two years to work on the design of the new mill. Paso de los Toros is now a larger version of Fray Bentos, but complete with the latest in ANDRITZ technology.

ANDRITZ supplied the complete mill, with core equipment manufactured at ANDRITZ's production facilities in Finland, Sweden, Austria, and China. Also included was a mill-wide maintenance contract including pre-engineering, site implementation, and warranty phase. The maintenance contract covers the entire maintenance of the mill process areas and industrial assets.

The ANDRITZ scope of supply to the Paso de los Toros project included a complete array of the latest technology for the maximum environmental and production performance, including the complete wood processing plant, one of the world's largest single-line fiberline, the complete pulp drying system, black liquor evaporation plant, HERB recovery boiler, biomass power boiler, white liquor plant, biosludge drying system and all the process pumps for the mill. ANDRITZ also supplied the

automation and controls systems as well as a mill-wide NCG collection and handling system for the capture of gases from the manufacturing process.

#### HIGH PULP QUALITY ACHIEVED EARLIER THAN EXPECTED

The mill started up in April 2023 and despite the challenges presented when commissioning and starting up such a huge project, it is now running well. Federico Mantiñan, General Mill Manager, UPM Paso de los Toros, says, "Since the start-up, we have been ramping up to full production on target and continually improving. The challenges have been overcome along the way, which are very normal when considering a project of this size.

"The pulp produced reached our high-quality demand even sooner than we expected and we are already selling 150 MWh of electricity to the grid, which represents 10% of the total consumption of Uruguay."

UPM and ANDRITZ signed a long-term maintenance contract for the mill to support the goal of top-class reliability and availability as well as outstanding performance on a continuous basis. Mantiñan says, "We have known ANDRITZ for many years since our experience at Fray Bentos, and we see the company as a long-term partner. In a green-field operation such as this, it is essential to have a team dedicated to ensuring operational stability with a focus on maintenance.

"The agreement works as a win-win for both parties. The maintenance agreement at Fray Bentos has proved to be worthwhile and we expect a similar performance at Paso de los Toros."

#### "AMAZING TO SEE THIS PROJECT COME TO FRUITION"

ANDRITZ supplied the complete wood processing plant to the mill designed specifically for eucalyptus species including four chipping lines. Daner Perez, Manager Fiberline at UPM Paso de los Toros says, "We were well prepared in advance for the wood processing area and the technology involved; this was mainly due to the experience we had at Fray Bentos. It was extremely beneficial to be involved at the design stage with ANDRITZ as we could share our ideas on improvements.

"It was a challenging task, as the wood processing area had to supply the world's largest single line fiberline with not only quantity, but also quality fiber. However, we have achieved our aim, and we are really happy with the result."

The fiberline supplied by ANDRITZ includes a state-of-the-art LoSolids continuous cooking technology with efficient heat recovery and DD-Washers based on unique washing and bleaching technology. Commenting on the fiberline installation and operation, Perez continues, "It was also important for me to be involved at the design stage for the fiberline as the technology and equipment has evolved a lot since Fray Bentos started up. Not only this, but again the size of the equipment was so much bigger.



"However, the communication with ANDRITZ has gone well since the very start of the project and we worked as a team on any of the challenges presented. It has been amazing to see this project come to fruition after all the discussions and visions of what it might be like."

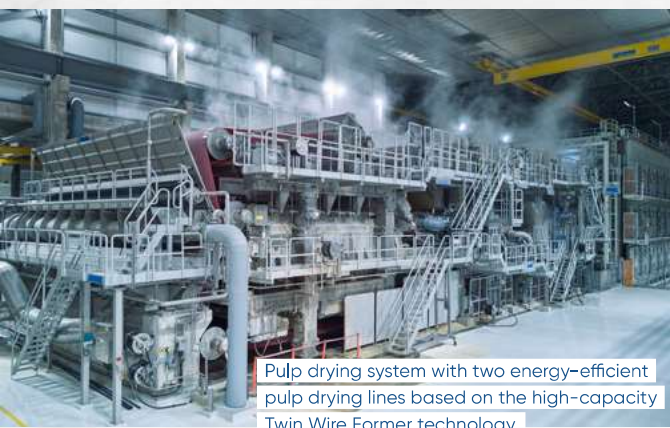
Carolina Pesce, Manager Recovery at the mill comments, "Right from the start on this project, we knew what we were looking at and what we wanted to achieve. For instance, in the evaporation area, we already had a lot of experience with ANDRITZ equipment including working with lamellas. It was a challenging time, particularly with erection time and commissioning, but with our experience and ANDRITZ's great communication and expertise the start-up went really

*"The environment and sustainability are also top of the list for us at UPM."*

**Marcos Battezzore**  
Vice President, UPM Paso de los Toros







Pulp drying system with two energy-efficient pulp drying lines based on the high-capacity Twin Wire Former technology.



One of the world's largest single-line fiberline.

well, and we are very pleased with the final result, particularly the evaporation plant's availability and cleanliness.

"The recovery boiler and power boiler both started up well and we are at full capacity and we believe we are definitely the greenest mill when it comes to NOx emissions, which are really low."

Digitalization and automation are also important areas for the Paso de los Toros mill. ANDRITZ supplied advanced automation and control systems with around 30,000 sensors installed across the mill. Santiago Tucci, Automation and Instrumentation Manager at the mill, says, "This mill is one of the forerunners in the world when it comes to instrumentation, digitalization, and automation. We have over 30,000 condition monitoring sensors and over 12,000 instruments, which we are using for predictive and preventative maintenance across the whole mill."

"This kind of project is really thrilling, exciting, and sometimes overwhelming! Being at the forefront of implementing this technology in one of the world's largest and most modern mills is a once-in-a-lifetime experience."

Marko Kvist, Project Director, ANDRITZ, says, "This project was a prime example of the teamwork between two companies committed to one aim – to create the most modern pulp mill with the most efficient output at the lowest cost and with the smallest environmental footprint."

"There were, of course, challenges to overcome during this project, including the pandemic that hit early on. However, due to the long-term close working relationship between UPM and ANDRITZ, we managed to overcome the challenges and start up the mill not far off the schedule."

### PASO DE LOS TOROS: FULLY ON ITS WAY

The Paso de los Toros mill is now fully on its way to reaching the design capacity and to consistently produce high-quality pulp for paper and board makers around the world. Battagazzore concludes, "With our experience at Fray Bentos on how to operate and maintain mills along with the expertise of ANDRITZ, we are already seeing the positive contribution to the sustainable operation of the Paso de los Toros mill. In particular, we are seeing benefits in water consumption and the efficient use of chemicals."

"We have had a very positive outcome when it comes to pulp quality, which is very important to us when it comes to our customers who are used to the best in quality from the Fray Bentos mill."

In the latest development, a dedicated trainline has been opened to transport pulp from the mill to UPM's dedicated terminal at Montevideo port, which will save substantially on transportation costs as well as taking many trucks off the road, thereby improving the mill's carbon footprint even further.

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## SCOPE OF SUPPLY

- The complete **wood processing plant** designed specifically for eucalyptus species including four chipping lines.
- One of the world's largest **single-line fiberline**, including state-of-the-art LoSolids continuous cooking with efficient heat recovery and unique washing and bleaching technology based on DD-Washers, all contributing towards high-quality pulp, highest operational time, and low chemical consumption, thus having lowest environmental impact.
- The complete **pulp drying system** with two energy-efficient pulp drying lines based on the high-capacity Twin Wire Former technology.
- An energy-efficient black liquor **evaporation plant** with a tailor-made process solution resulting in high availability and increasing the overall production and efficiency of the plant.
- The **HERB recovery boiler** features energy-efficient flue gas cooling and feed water preheating technologies to maximize steam production for power generation.
- A **biomass power boiler** based on high-quality ANDRITZ EcoFluid Bubbling Fluidized Bed (BFB) technology. The scope of supply includes a biomass-fired boiler with flue gas cleaning and other auxiliary equipment. The power boiler also supplies steam for the mill during start-up. The fuels used are bark, harvesting residues and sludges from the mill.
- A complete **white liquor plant**. The new recausticizing plant includes efficient green liquor filtration with LimeGreen filters – producing clean green liquor and minimizing waste to landfill. The new lime kiln plant includes two lime kilns with high-efficiency ANDRITZ LimeCools.

"Since the start-up, we have been ramping up to full production on target and continually improving."

Federico Mantiñan  
General Mill Manager, UPM Paso de los Toros

