



# INNOVATION FUND

Driving clean innovative technologies towards the market

## LK2BM: Conversion of a pulp mill fuel source to biomass



### Project summary

The aim of LK2BM project is to reduce up to 76% of direct greenhouse gas (GHG) emissions from the pulp mill's lime kiln (compared to a conventional technology), based on a retrofit solution which allows the conversion from natural gas to a biomass fuel. A pilot-scale rotary kiln burner and its wood fuel feeding lines and equipment will be designed and built, in order to allow a fuel shift to 100% hardwood residues (eucalyptus sawdust and pellets), replacing the current natural gas-fired in the existing pulp mill's lime kiln.

#### COORDINATOR

Navigator Pulp Setubal

#### LOCATION

Portugal

#### SECTOR

Pulp & paper

#### AMOUNT OF INNOVATION FUND GRANT

EUR 4 488 046

#### RELEVANT COSTS

EUR 7 480 077

#### STARTING DATE

01 January 2022

#### PLANNED DATE OF ENTRY INTO OPERATION

01 January 2025



### **Innovative retrofit solution to substitute fossil fuels**

Considering the lime kiln equipment is responsible for most of the fossil fuel consumption in the pulp mill, the key innovative element of the project relates to the fuel shift from natural gas to hardwood residues (generated from locally sourced wood handling operations). This represents a first-of-a-kind application of using such biomass residues as a fuel for rotary lime kilns.

The project will overcome key technological challenges by introducing two innovative elements that include: (1) a new burner design, which extends the kiln's fuel options and allows hardwood residues to be used, whilst ensuring that the integrity of the kiln is maintained compared to a standard kiln; and (2) a retrofit solution that avoids the need to install a new lime kiln and thus achieves significant GHG emissions savings without increasing costs.

### **Local economic benefits on top of the significant GHG emissions reduction**

Although no changes in the production capacity of kraft pulp are envisaged at the plant, the conversion of the lime kiln will lead to a decrease in GHG emissions of 76% compared to a reference scenario. This represents the avoidance of more than 185 000 tCO<sub>2e</sub> net absolute GHG emissions during the first ten years of operation. The locally-sourced biomass

is considered as energy recovery from a waste stream, with respect to the waste management 'hierarchy', since the sawdust (a by-product) from wood handling operations is used as feedstock in the project.

The proposed innovation in feedstock substitution will improve the cost base of the kraft pulp production process in the pulp and paper industry. Using other local biomass wastes will also generate business opportunities with external suppliers, thereby strengthening the supply chain of bio-based feedstock and promoting the forestry and wood-processing industries locally. This will result in significant potential benefits to the local and regional economy where the plant is located.

### **Important scale up potential in pulp plants, and other energy intensive industries**

The project has the potential for further expansion on its current site, as well as the installation of the new technology to other pulp mills in the company's group within the same region. The proposed solution could also be easily replicated within the pulp and paper sector, especially in regions where eucalyptus (used as the biomass fuel in this case) or other hardwood species are abundant. The technology could finally also be credibly applied across the economy, especially in other energy intensive industries such as cement and lime.

