

# ANNUAL BAROMETER

## WOOD PELLET INDUSTRY

### IN PORTUGAL

# — 2023/24 —

## Summary



Photographs taken at all six of the large-scale pellet mills in Central Portugal show that they are **highly dependent on whole trees, especially pine**, despite the company claims that they only use residual biomass.



The pellet industry's **huge demand for wood is contributing to the sharp decline in pine stands in Portugal** and the difficulties in sourcing wood on this scale are leading to the closure of some large-scale mills. ATGreen in Guarda and Futerra Fuels in Valongo (Northern Portugal) were Portugal's two largest mills and received millions in public finance, but both closed little more than a year after having begun operations.



Grupo Visabeira's Pinewells mill in Arganil is currently the largest mill in the country, and recently **received more than 4 million Euros from the EU to finance the refurbishment and modernisation of the plant**. This helped it increase earnings by 31% in 2022, while other large-scale mills closed their doors. It remained competitive by centering its production almost exclusively on the export market, with most of its pellets going to Drax power station in the UK.



**Drax power station continues to be the single largest consumer of Portuguese pellets** and the UK the largest export market. In 2022, around 43% of Portugal's pellet production was burned in power stations in Northern Europe. Burning biomass in power stations is heavily subsidised, and Drax receives around 2 million euros a day in renewable energy subsidies. Without these incentives, the construction of large-scale pellet mills in Portugal would not be economically viable and would not have happened.



Portuguese pellet production fell slightly in 2022 compared to 2021 to around 750,000 tonnes, a decrease of 11.8%, reflecting a trend seen across the EU. The decrease is due to falling demand from the industrial energy and domestic heating sectors, as a result of the sharp price rises associated with the war in Ukraine. **Strong competition for scarce raw materials in Portugal, particularly pine logs, was also a factor.**



The production of pellets in Portugal in 2022 required around **1.4 million tonnes of wood, and the industry continues to be the second largest consumer of pine**, accounting for 20% of total consumption.

# What are wood pellets?

Wood pellets are made from compressed finely-chipped wood, and are burned to generate electricity in power stations or for domestic heating in pellet boilers. They are produced almost exclusively from wood - i.e. whole trees or sections of trunk, which can arrive at the mills as roundwood or already chipped. Pellet producers also compete with other industries for sawmill by-products - around 50% of the wood used by sawmills becomes by-products such as chips and sawdust, and these can have more beneficial uses than burning such as the production of wood panels for use in construction and furniture-making. Many pellet producers in Portugal also consume residual forest biomass, but this tends to be used in industrial dryers during the production process, and not as a raw material for the pellets.



Despite recent changes to EU regulations which **outlawed burning roundwood** as a means of meeting renewable energy targets, new photographic evidence from all six of the large-scale wood pellet mills<sup>1</sup> in Central Portugal, where wood pellet production is concentrated, highlight the extent to which pine roundwood is still being used by pellet mill operators.

Despite the evidence to the contrary, wood pellet mill operators continue to claim that they only use residual biomass to produce pellets. For example, Pinewells, now Portugal's largest pellet mill, **claims that** its product *"has no environmental impact... and supports forest management by using mainly products from forest management and waste from the wood industry."* Operators of ATGreen, formerly Portugal's largest pellet mill, **claimed that** *"we manufacture renewable biofuel... generated from forest biomass residues and non-polluting wood industry waste."* Enerpellets, which operates two mills in Central Portugal, **states that** their pellets are *"made up exclusively of forest biomass waste and by-products."*

The pellet mill factsheets in this Annual Barometer show that large volumes of roundwood and logs from whole trees are being or have recently been used in all of the large-scale pellet mills in Central Portugal. The significant competition for biomass resulting in large part from demand from the pellet industry has even led **pellet producers to complain** of the *"enormous difficulty in acquiring raw materials, particularly pine logs."*

The pellet industry is also one of the driving forces behind the **"significant increase in harvested area"**

observed recently in Portugal, and therefore a contributing factor to the dramatic decline in maritime pine (*Pinus pinaster*, referred to subsequently as pine) forest stands seen over the last few decades. Between 2008 and 2015, **Portugal lost more than a quarter of its pine forests**, and when new government figures for the period 2015 to 2025 are released, the decline will undoubtedly have continued.

The over-extraction of pine due to higher market demand for forest products is causing pine stands to be clear-cut prematurely and the availability of mature trees has declined significantly as a result. On top of this, frequent fire events in younger pine stands reduce their ability to regenerate naturally, leading to them being replaced by other species, particularly exotic and invasive species such as eucalyptus and acacias. Although there is legislation aimed at preventing these types of dynamics, they are intensifying given the lack of enforcement capacity of government institutions.

On top of this, a **recent study** pointed out that over the last 10 years Portugal's forests have not acted as a carbon sink, especially in the years when there were major forest fires, most notably in 2017. This means that Portugal's most important tool for fighting climate change is actually doing the opposite. There are no published statistics on logging rates, but an increase in harvesting due to market pressure is likely to be another strong contributor to Portuguese forests becoming a source of emissions.

<sup>1</sup> With an annual production capacity of over 100,000 tonnes per year.

The dependence on primary forest biomass also makes Portugal's pellet production highly polluting. Burning wood emits **more carbon emissions than fossil fuel equivalents**, which creates a **significant carbon debt** in the atmosphere that won't be repaid for many decades. Even burning **thinnings** and

**genuine forestry residues** has been shown to have a negative climate impact, and cannot be considered sustainable or non-polluting. These impacts are described in more detail in the **2022 Annual Barometer on the Wood Pellet Industry**.

## Wood pellet mills in Central Portugal

*(with an annual production capacity of 100,000 tonnes or more)*



1. **AtGreen** | 180,000 | *Guarda (closed)*
2. **Pinewells** | 140,000 | *Arganil*
3. **Delitimbers** | 120,000 | *Proença-a-Nova*
4. **Enerpellets** | 120,000 | *Alcobaça*
5. **Pelletsport** | 100,000 | *Mortágua*
6. **Enerpellets** | 100,000 | *Pedrógão Grande*

## Pellet production in Portugal in 2022

Portuguese pellet production fell slightly in 2022 relative to 2021 to around 750,000 tonnes.<sup>2</sup> This reflected a trend seen throughout the EU, whereby **demand for industrial wood pellets decreased by 15% overall** owing to sharp price increases. The spot price for Portugal's industrial wood pellet exports for example hit a **record 352 Euros per tonne in October 2022**, more than double the average of the previous year. The price of pellets produced for the domestic heating market also more than tripled in some cases. This occurred primarily due to the EU's import ban on Russian and Belarusian pellets and increases in electricity and gas prices caused by the Ukraine war.

However, competition for raw materials in Portugal has also played a role, and prices for pine roundwood remained extremely high in 2022, having doubled in

recent years. One pellet producer **recently stated that** *"As there is a shortage [in raw material], pine wood is sold at forestry auctions at much higher prices. It used to be sold at 40 or 50 Euros a tonne and now it's sold at 100 Euros... Either we pay up or we don't have any raw material."*

Pellet production required around 1.4 million tonnes of wood in 2022 and, **according to Centro PINUS**, is still the second largest consumer of pine in Portugal, accounting for 20% of the total consumption. At the same time, Portugal continued to consume more than double what is considered to be the sustainable harvest rate for pine, which required large volumes of imports and highlights the fierce competition for wood between manufacturing industries

<sup>2</sup> This figure is an estimate based on the fact that 503,000 tonnes of pellets were exported, and in general exports account for around two thirds of Portugal's total production.

## The main consumers of Portuguese pellets

Drax power station remains the single largest consumer of Portuguese pellets and the UK the biggest export market, with Denmark the second largest. Put together, **around 300,000 tonnes of Portuguese pellets** were burned in power stations in Northern Europe in 2022, accounting for around 40% of the production. Biomass burning at power stations in Europe is heavily subsidised, with **Drax receiving around 2 million Euros a day** in renewable energy subsidies. This is indirectly subsidising pellet producers in Portugal, whereby industrial pellet consumers can afford to pay inflated prices to producers that offsets rising production costs such as scarcity of raw materials and increasing electricity prices.

<sup>3</sup> Information provided by AIMMP.

Although exports of industrial pellets decreased slightly in 2022, exports of ENPlus A1 certified pellets produced for the heating sector increased by around 50%, driven largely by increasing demand from France, Italy and Belgium. Whereas consumers in Portugal decided to burn fewer pellets for heating as prices rose, the deficit in supply elsewhere in Europe caused by the Ukraine war meant that more of Portugal's heating sector pellets were exported. The overall production of pellets for heating remained consistent in 2023 compared to 2022, at around 300,000 tonnes.<sup>3</sup>

Drax power station in the UK. *Adrew Whale/Wikimedia Commons*



## Significant changes at large-scale pellet plants in Portugal

Although Portugal's pellet market remained relatively stable in 2022 relative to 2021 in terms of production, there have been significant changes to a number of the large-scale mills in the past two years. Several closed down, two permanently (to date) and three subsequently reopened under new management after long periods of inactivity, largely due to strong competition for raw materials and significant increases in the price of pine. One large-scale mill managed to buck the trend and increase its profit margins.

ATGreen, operated by Khronodefine Lda., began production in April 2022 and was pitched as Portugal's largest pellet mill with an annual production capacity of 180,000 tonnes per year. However, it **shut its doors in June 2023** after little more than a year of operation. Around 30 workers were made redundant, some of which are still owed three month's wages by the

company. Directors claimed that the closure was temporary, but the mill has still not reopened. Khronodefine Lda **received over 7 million Euros in public finance** to construct the mill. The question remains as to how public funding for these mills can be granted without any assessment of the availability of and competition for raw materials.

Futerra Fuels also closed its doors in October 2022, after having only begun to produce pellets in 2021. The 175,000 tonne capacity pellet mill (Portugal's second largest mill when operational) was pitched as the world's largest torrefied or black pellet manufacturer, but it is unlikely that any black pellets were ever produced. The mill also produced standard/white pellets. Futerra Fuels received over 11 million Euros in EU funds to finance construction costs.

The Pinewells pellet mill in Arganil.



Gesfinu's Pellets Power 1 and 2 mills, both with a 100,000 tonne annual capacity, closed in May 2022, and were then reopened a year later in September 2023 under the name Pelletspar. Also, the 120,000 tonne pellet mill in Cercal, formerly Glowood, had stopped production in 2021 and was then reopened in 2022 by Pinewells.

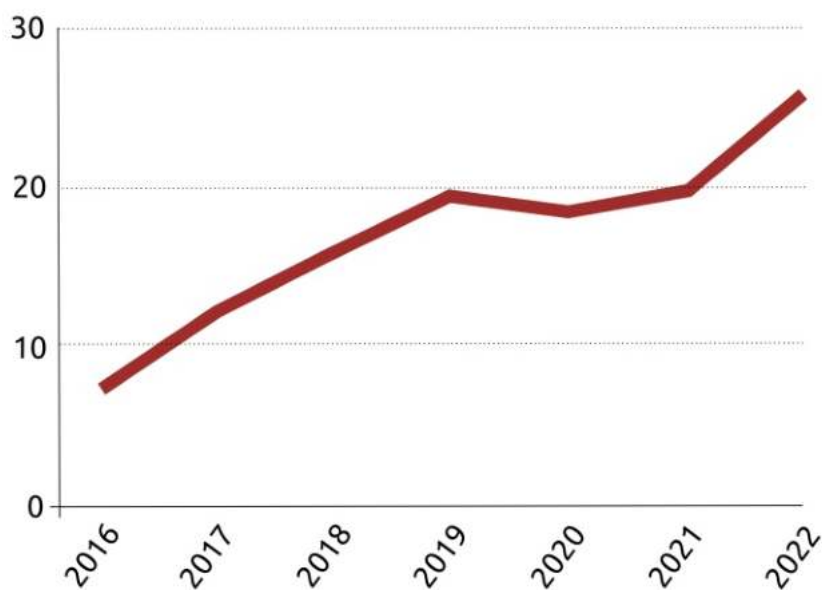


However, during this turbulent period for other pellet producers, the Pinewells mill in Arganil, owned by the Visabeira Group, continued to do well financially. It is currently the largest pellet mill in Portugal by capacity, following the closure of two larger mills. Pinewells managed to maintain its production levels by "remodelling and modernising the Arganil plant...with new chipping and drying equipment and an increase in storage capacity." This was achieved with the help of a public grant of almost 4 million Euros financed by the EU's European Regional Development Fund. Pinewells recorded a 31% increase in earnings in 2022, despite the difficulties experienced by other major players in the sector. As already mentioned, during 2022 Grupo Visabeira also restarted operations at its recently acquired 120,000 tonne-per-year Pinewells II pellet mill in Cercal (Southern Portugal), previously called Glowood. Pinewells' overall annual production capacity now stands at around 260,000 tonnes per year, making it by far the largest pellet producer in the country.

Pinewells achieved its positive results at its Arganil mill by concentrating its production almost exclusively on the industrial pellet export market and by renegotiating its contracts with power station operators to reflect the higher pellet prices on the international market. This made it possible to offset the rise in pine prices and the increase in energy costs that the company was facing. By focusing on the production of industrial pellets, Pinewells has also managed to reduce its dependence on pine, which currently accounts for half of its raw material, whereas in previous years it was much higher.

In 2021 Grupo Visabeira described the "enormous difficulty in acquiring raw materials, particularly pine

Valor de negócios da Pinewells (milhões de Euros)



logs", and according to its 2022 Annual Report, "given the constraints on the acquisition of raw materials, particularly pine... there was a need to drastically reduce production of domestic pellets and focus the company's production on industrial pellets. This strategic decision was crucial, as concentrating production on industrial pellets and drawing up new production mixes made it possible to manage the raw materials available to keep the plant operating at its production capacity levels." Although Pinewells is clearly still highly dependent on pine, it is a worrying development that hardwood and broad-leafed tree species can now also play a bigger role in its feedstock mix. Similarly, increased use of eucalyptus will also add to pressure for plantation expansion in Portugal given that the country already imports significant quantities each year.

Despite Grupo Visabeira stating that "Pinewells focuses its activity on adding value to residual biomass and forestry waste", in a 2022 Sustainable Biomass



**Partnership (SBP) audit report** Pinewells describes how *“The pellets are made mainly from fibre of pine (mainly *Pinus pinaster*) and the industrial pellet also includes hardwood. The raw material comes from both thinning and clear cutting that Pinewells receives as roundwood or sometimes already chipped.”* Although companies are no longer required to provide accurate accounts of the quantities of raw materials they use in order to achieve SBP certification, a **previous report published in 2019** stated that 243,000 tonnes of biomass had been used. **2022 figures** also state that Pinewells used 3,400 tonnes of secondary feedstock, and 12,520 tonnes of wood from fire damaged areas. It can therefore be assumed that in 2022 the pellet mill used around a quarter of a

million tonnes of green primary biomass directly from logging operations, most of which was pine roundwood.

Drax power station in the UK has been the **principal destination for the pellets** produced by Pinewells for a number of years. The company is clear that the *“growth in the pellet sector, which had been halted for a number of years, saw an upward reversal in 2017, essentially due to the conversion of several European power stations to use pellets instead of fossil fuels”*. This shows how demand from converted coal-fired power stations in Northern Europe, and Drax in particular, has driven production at Portugal’s large-scale pellet mills for at least the last six years

## Fires at pellet mills are a potential threat to communities

Piles of woodchip caught fire at the Pinewells mill in Arganil three times during the summer of 2023, with the third fire, in October, taking firefighters four days to extinguish. A fire in August left three firefighters injured due to exposure to heat and smoke. Fires are one of the ways in which wood pellet factories can have negative impacts on the health of the surrounding communities. According to the WHO, PM2.5 from wildfire smoke is associated with premature deaths and can cause and aggravate numerous diseases, as well as putting emergency workers at risk of injuries such as burns and smoke inhalation. It also describes how more research is needed to understand the long-term health effects of smoke exposure in areas that suffer repeated and cyclical exposure to forest fires, as is often the case in the Centre of Portugal.



Firefighters responding to a fire at Pinewells in October 2023.

## Recommendations

It is now clear that the scarcity of raw materials has reached breaking-point for the pellet industry in Portugal, whereby two of the country's largest mills have been forced to close their doors in the past two years, with significant disruption experienced by other operators. In addition to the four areas of urgent action recommended in the 2022 Annual Barometer on the Wood Pellet Industry, the Portuguese government must also introduce a plan to phase out Portugal's large-scale pellet mills altogether. This would allow for greater protection of Portugal's rapidly declining pine forests, reduce Portugal's contribution to the climate impacts of energy generation, and help to protect other industrial users of pine that produce higher-value goods and don't burn it, such as sawmills and wood panel manufacturers. To this end, these additional demands are made of the Portuguese government:

- Stop publicly funding the construction and refurbishment of pellet mills, and any works aimed at increasing their production capacity.
- Increase public funding for forest management practices that will reverse the loss of pine and mixed broad-leafed forests.
- Assess the real impact of the pellet industry on Portuguese forests and on other pine-dependent sectors that manufacture wood products with greater added value and which keep the carbon sequestered for much longer, such as the sawmill and wood panel industries.



zero.



# ATGreen

## Casal de Cinza, Guarda



**Annual capacity:** 180,000 tonnes  
**Estimated annual wood use:** Over 300,000 tonnes  
**Parent company:** Khronodefine Lda.  
**Public finance received:** 7.1 million Euros

The ATGreen mill is Portugal's newest and largest wood pellet mill by capacity, but it **closed down in June 2023** having only begun production in April 2022. All of its production was due to be **exported to Northern European power stations**. Photos taken at the site when it was operational show large volumes of pine roundwood, much of which burned in a devastating fire that swept through Portugal's largest national park, the Serra da Estrela, in the summer of 2022. Although the pellet industry claims to help to reduce the risk of forest fires, it is in fact one of the main beneficiaries of large fire events, which give it access to large amounts of cheap and relatively dry wood. The wood piles at ATGreen also contained large diameter pine tree trunks that weren't fire-damaged. There were significant questions as to where the company would source such huge quantities of biomass each year, given that **99% of its feedstock came directly from forestry operations**. These questions have been answered: competition for increasingly-scarce raw materials, pine in particular, is likely to be the major factor in the mill's abrupt closure.



# Pinewells

## Arganil, Coimbra



**Annual capacity:** 140,000 tonnes  
**Annual wood use:** 243,000 tonnes  
**Parent company:** Grupo Visabeira  
**Public finance received:** 5.6 million Euros

Pinewells is Portugal's largest operational pellet mill, and produces pellets **predominantly for the industrial power sector**. Drax power station in the UK, the largest biomass plant in the world, is the main consumer of Pinewells' pellets. Drax **burned over 160,000 tonnes** of pellets produced in Portugal in 2022. **Almost all of Pinewells' feedstock** comes directly from forest operations, and photos from the factory clearly show large volumes of roundwood arriving in trucks and in wood piles, particularly pine.

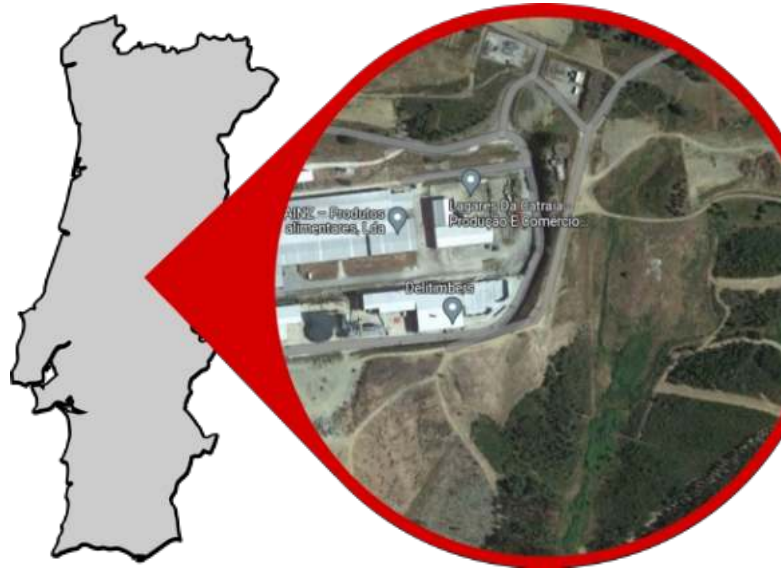


# Delitimbers

## Proença-a-Nova, Castelo Branco

**Annual capacity:** 120,000 tonnes  
**Estimated annual wood use:** 200,000 tonnes  
**Parent company:** Delitimbers, Lda.  
**Public finance received:** 9.2 million Euros

The Delitimbers pellet mill began production in May 2022, and is Portugal's second largest operational mill. It produces pellets for electricity generation and domestic heating, and exports to power stations in Northern Europe via a port in Figueira da Foz. The company states that **100% of its feedstock is from primary sources**, and that pine is the main species it uses. Photos from the site show large volumes of pine roundwood, as well as some eucalyptus. A large forest fire in the summer of 2023 near to the mill has provided the mill with huge amounts of cheap pine.



# Pelletsfirst

## Coz, Leiria



**Annual capacity:** 120,000 tonnes  
**Annual wood use:** up to 200,000 tonnes  
**Parent company:** Grupo Enerpellets  
**Public finance received:** 10.8 million Euros

Pelletsfirst is Portugal's second largest operational pellet mill, and in 2019 consumed 197,000 tonnes of wood, 79% from primary sources, and 61% maritime pine (*Pinus pinaster*). Consumption has been lower in recent years, totalling 82,000 tonnes in 2022, 82% from primary sources. The mill produces pellets for the industrial power and domestic heating sectors. The company states that its pellets are "made exclusively from forest biomass waste and by-products", but photos taken at the site show substantial volumes of logs from whole trees.



# PelletsPor

## Mortágua, Viseu



**Annual capacity:** 100,000 tonnes  
**Annual wood use:** up to 200,000 tonnes  
**Parent company:** PelletsPor Energy Unpersoal Lda  
**Public finance received:** 3.7 million Euros

PelletsPor (previously Pellets Power) operate two pellet mills with an annual capacity of 100,000 tonnes. The company states that **up to 200,000 tonnes of wood** are required annually, 80% of which is from primary sources, and the main species used is maritime pine. Older **certification reports** state that over 90% of the wood used by the mill is "low-grade roundwood", and photos taken at the site clearly show large amounts of roundwood of varying diameters. The pellets produced are certified for the industrial power and domestic heating sectors.



# Newpellets

## Pedrógão Grande, Leiria



**Annual capacity:** 100,000 tonnes  
**Estimated annual wood use:** 100,000 tonnes  
**Parent company:** Grupo Enerpellets  
**Public finance received:** 3.5 million Euros

Grupo Enerpellets operates two large-scale pellet mills in the district of Leiria. The company states that **most of its production is exported**, most likely to power stations in Northern Europe. The Pedrógão mill began producing pellets in 2013 for both the industrial power and domestic heating sectors. The most recent publicly-available **biomass consumption data is from 2019**, when the mill used 102,000 tonnes of wood, all from primary sources, and 88% of which was maritime pine. Photos from the site show large volumes of pine roundwood.

