Domestic wood heating in Europe

Current situation and prospects for development

Foreword

Energy is an important and strategic issue for Europe. Energy consumption is closely monitored in Europe, and most of the data is available on Eurostat. Thanks to meters and networks, it is easy to find out how much electricity or gas is being consumed. As for energy sources such as oil and heating oil, flows are controlled and regulated. But what about wood heating? The figures are more indicative, as there are no reliable statistics and no uniform structure for the sector across Europe.

Despite the fact that domestic wood heating is the oldest renewable energy source, it is the least well identified and its all-round contribution unrecognised. What is its share of household energy consumption? For what final energy output? Is it a promising economic sector for Europe? How can we develop this sustainable and renewable energy source and what is its potential?

The CEFACD[1], based on a study of 7 European countries and the United Kingdom[2], carried out with the help of the Céric Laboratory, has sought to shed light on the role of domestic wood heating in the European energy mix and to present the prospects and potential of the sector to help meet the challenges facing the EU.

The conclusions are clear: domestic wood heating is essential if we are to meet our energy and housing decarbonisation targets. Thanks to technology, innovation and energy efficiency, we will be able to produce more heat with less wood. Wood heating is also a tool for resilience and sovereignty, reducing pressure on peak electricity consumption as part of the trend towards electrification. It is also an important economic and social lever for households and European countries.

[1] The CEFACD is the European Committee of Manufacturers of Domestic Heating and Cooking Appliances. The CEFACD has been the voice of the domestic heating industry to EU regulators for over 25 years.
[2] Full analysis attached.

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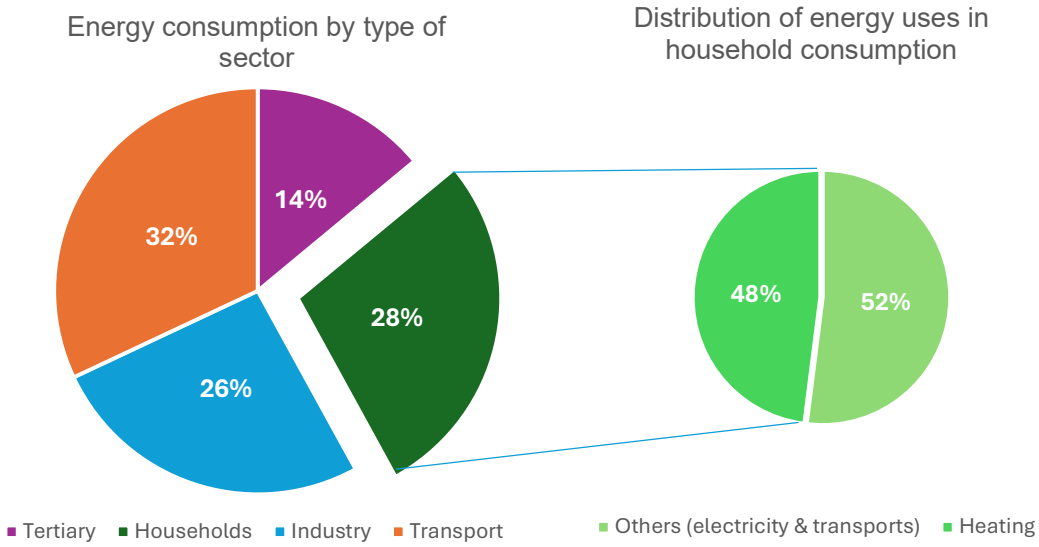
Domestic wood heating in Europe: A key economic player in the energy mix

What is the breakdown of energy consumption in Europe?

In 2022, households in the 27 Member States of the European Union consumed 242,487 ktoe of final energy (or 2,820 TWh), 48% of which was for heating.



Source: Eurostat. Data processing: CEFACD and Céric Laboratory® 2024

What proportion of European household consumption is attributable to domestic wood heating?

In 2023, domestic wood heating accounted for

388 TWh	249 TWh	18.3%
PRIMARY BIOMASS CONSUMPTION	**FINAL ENERGY PRODUCTION**	**PERCENTAGE OF HEAT CONSUMED BY HOUSEHOLDS FROM DOMESTIC WOOD HEATING**

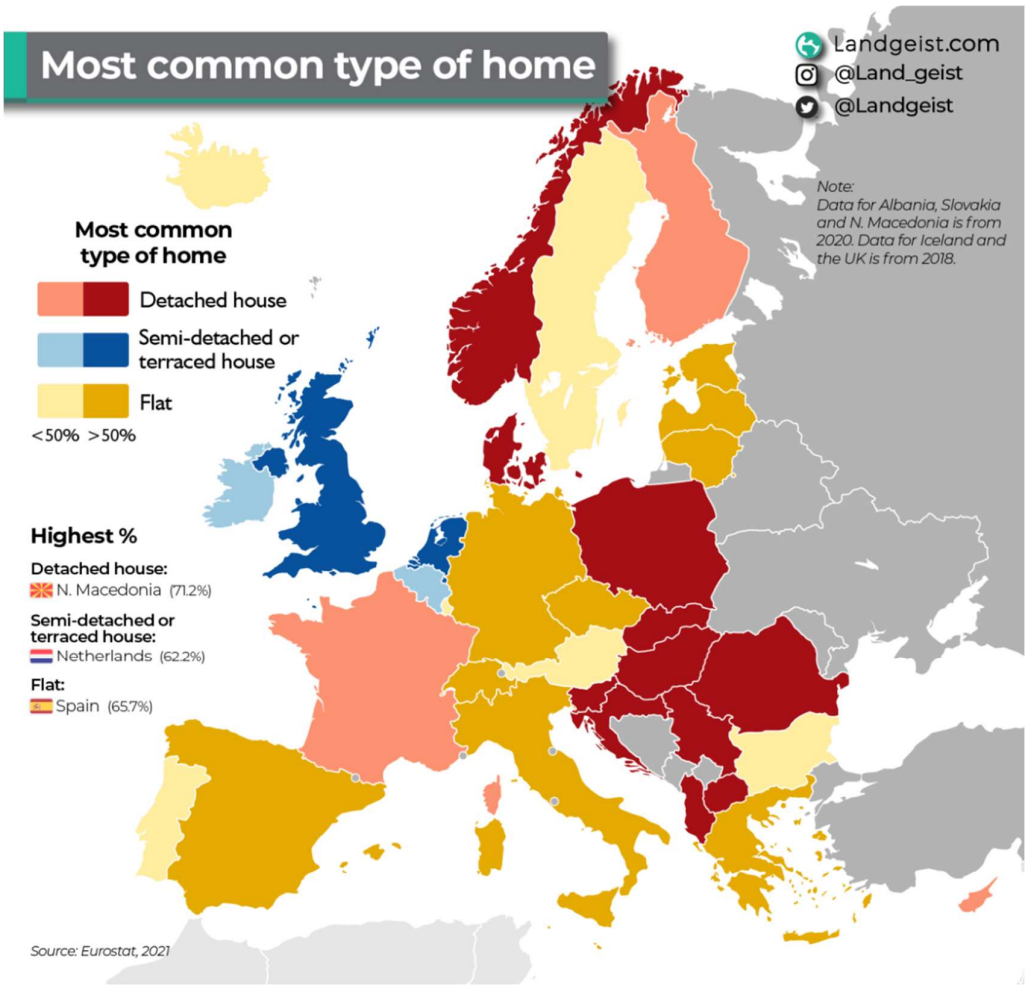
Data processing: CEFACD on the basis of the Céric Laboratory® 2024 study[3]

By way of comparison, the heat generated from domestic wood in Europe is equivalent to the annual heat consumption of France from all sources (wood, gas, electricity, fossil fuels, etc.). It therefore represents a very significant and strategic contribution.

[3] These data have been extrapolated from analyses of the number of installed domestic wood-fired appliances and average biomass consumption in 7 EU countries: Belgium, Denmark, France, Germany, Italy, Poland and Spain. These countries represent 70% of the European population in 2022 and 75% of the number of wood-fired appliances installed.

How many households and domestic wood-fired appliances are there in Europe?

There are **213 million households** in the European Union, of which around 150 million are used as primary residences. **52% of these are houses** (i.e. 111 million) This proportion varies considerably from one country to another.



Domestic wood-fired appliances are mainly installed in houses (detached or semi-detached). Although there are wood-fired appliances in flats, they are still marginal and often little used.

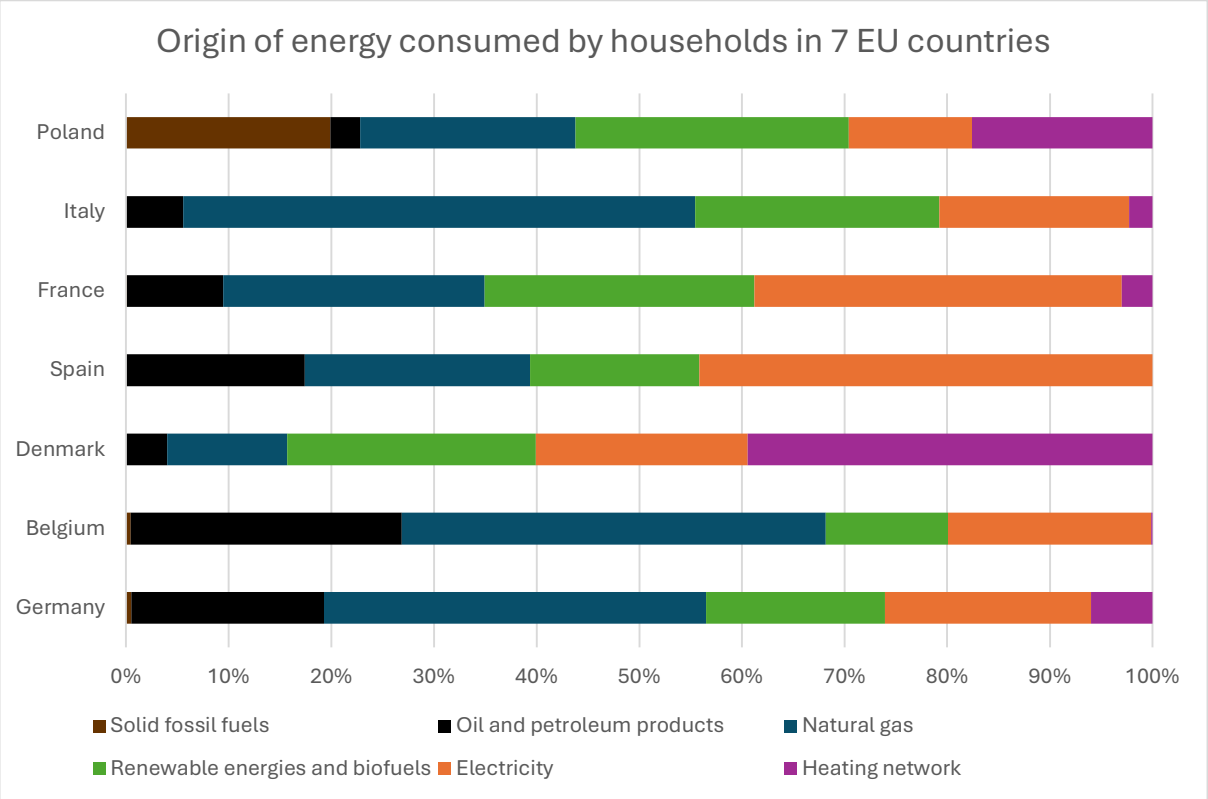
Between 40 and 45%
of houses are equipped with a domestic wood-fired appliance

In 2023, around 48.5 million domestic wood-fired appliances (fireplaces, fireplace inserts, wood-fired stoves or pellet stoves and wood-fired boilers) were installed across Europe. Added to this are log-fired boilers (around 2 million), which are very often installed in rural areas and are specific to certain European markets (Germany and Austria), where sales are currently more limited.

Wood-fired cookers, which are included in the category of wood-fired appliances not primarily used for heating, are excluded from the general analysis. However, they account for 1.5 million of the appliances installed.

Primary or additional heating?

Domestic wood heating is one of the most common forms of heating in European households. **More often than not, it is used to supplement a main heating system** fuelled by fossil fuels (gas, oil, coal, etc.) or electricity (convection heaters, heat pumps, and so on).



Source: Eurostat. Data processing: CEFACD and Céric Laboratory® 2024

Poland still uses a lot of coal, Italy, Germany and Belgium all use natural gas, Denmark relies mainly on gas for its heating networks, and France and Spain use the most electricity.

In Europe, the Scandinavian countries have demonstrated that the electrification of heating goes hand in hand with the development of domestic wood heating as a back-up. In Norway, for example, 80% of detached houses have a heat pump and 86% have a domestic wood-fired appliance. Indeed in Norway many new build houses are required to have a Chimney installed ready for connection to a woodburning stove.

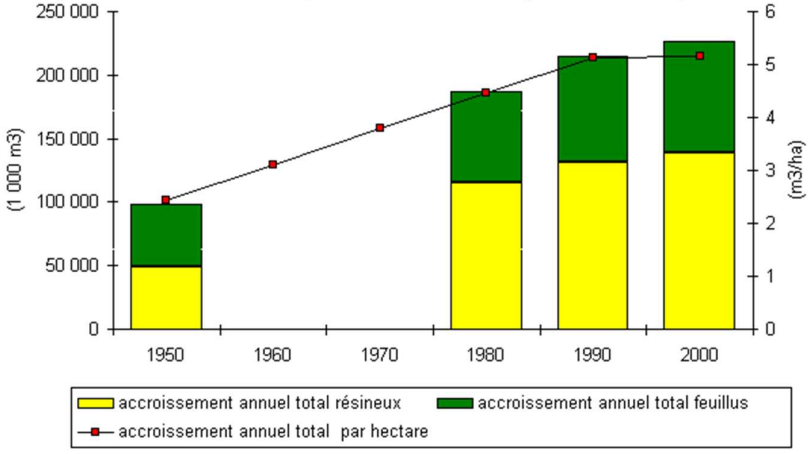
Wood heating is therefore a local, versatile, flexible and storable solution that perfectly complements the energy mix. It is also particularly relevant to the electrification of energy uses. It is a very important tool for mitigating peak electricity consumption in Europe (see next question).

What additional contribution can wood heating make to the energy mix, to society and to the fight against climate change?

Wood heating is a renewable, ecological, local and affordable energy source.

- Wood **regenerates over a human lifetime**. Moreover, **the average forest area in the EU has been increasing over the years:** it increased by around 11 million hectares between 1990 and 2010 (an increase of almost 10% over this period), mainly as a result of natural expansion and afforestation efforts. In recent years, afforestation efforts have been stepped up in several European countries.

Change in overall annual growth in the European Union (1950-2000)



Source: European Parliament

- The consumption of wood-energy is recognised as being near **carbon neutral**. **Burning wood** is a chemical process that produces heat and **emits carbon dioxide (CO_2),** water vapour (H_2O) and unburnt carbon particles (PM - particulate matter). Although burning wood releases greenhouse gases, this CO_2 is not an additional gas that increases climate change. The amount of CO_2 released by wood is **reabsorbed by growing forests**.

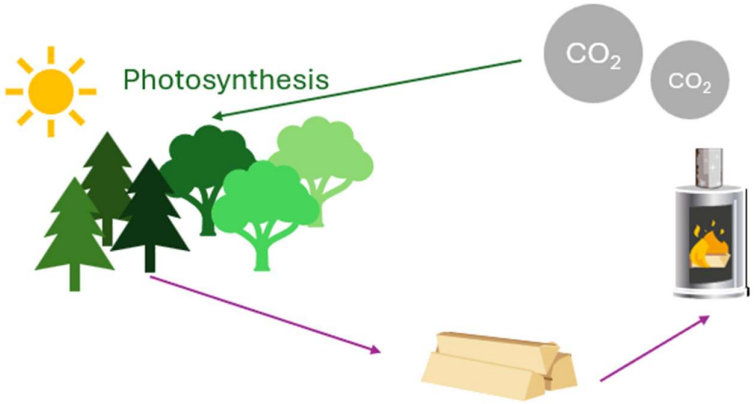


Illustration: Céric Laboratory® 2024

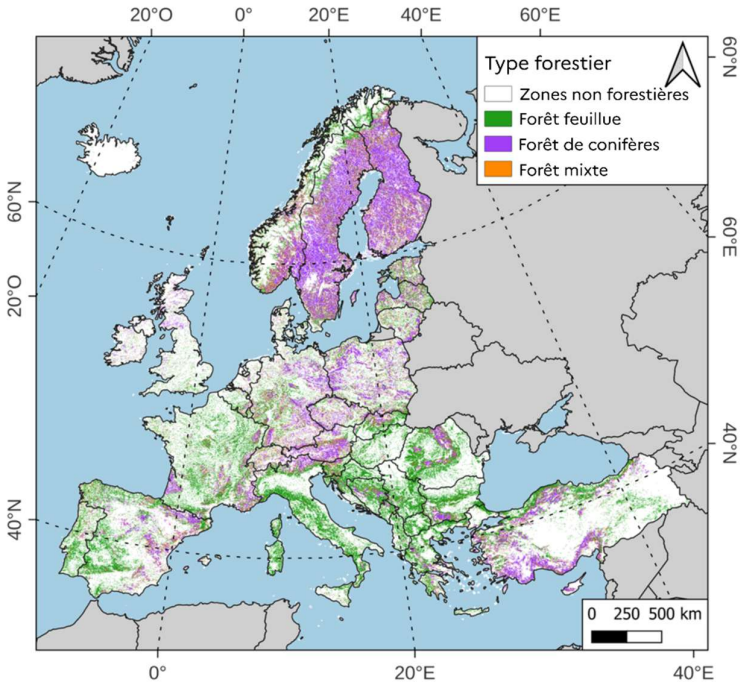
In addition, **replacing or combining heat produced from a fossil fuel source with heat produced from wood avoids CO_2 emissions**. It is important to note that electricity production in Europe is still largely carbon-based (averaged across Europe).

Average emission factors by fuel type

Fuel oil	Gas	Electricity
324 gCO_2e/kWh	244 gCO_2e/kWh	217 gCO_2e/kWh

Sources: Eurostat, European Environment Agency & International Energy Agency. Illustration: Céric Laboratory® 2024

- Firewood is **supplied in short circuits**, generally within a 100 km radius. Virtually all European countries have significant forestry potential within their borders**.** For example, Europe currently has **227 million hectares of forest**, or 35% of its total land area.



Sources: National Institute of Geographic and Forest Information & Copernicus.

- Wood heating is the **most affordable energy source available to Europeans**. Over the last decade, and despite the tensions on the pellet market in 2022, the price of wood-energy has remained fairly stable, while fossil fuels and electricity have risen sharply.

Price per 1 KWh consumed

24 to 40 Euro cents	11 to 17 Euro cents	7 to 9 Euro cents

Source: European Commission. Illustration: Céric Laboratory® 2024

Wood heating contributes to well-being and social cohesion

Numerous publications and surveys[4] regularly confirm that domestic wood heating has soothing properties and **reduces stress**. Physiological effects include lower blood pressure.

The fireplace also **encourages social interaction** and communication within families.

In Scandinavian countries, this contribution to the well-being of users is expressed in the concept of **"hygge".** Taken from the Danish language[5], it refers to a warm atmosphere and the enjoyment of the finer things in life with loved ones. There are other advantages to heating your home with wood. Firstly, **it makes no sense to have the same temperature throughout the house. It should be adapted to the use of each room**. Cool in the bedroom for a good night's sleep, moderate in the busy kitchen, but still warm enough to stay nice and cosy in the living room. Secondly, **the flame provides warm light to compensate for reduced light levels in winter**. Finally, fire helps to **satisfy the need to contemplate natural phenomena** and soothe the spirit.

The social & physiological advantages of domestic wood heating

Illustration : Céric Laboratory® 2024

Wood heating limits energy tensions during winter consumption peaks.

In winter, the electricity systems of EU countries can come under severe strain. Some countries resort to load shedding, while others pay a high price for imported energy. However, a study in France[6], where 40% of houses have a domestic wood-fired appliance, has shown that wood heating reduces electricity demand on winter evenings by 10 GW, the equivalent of 10 nuclear units and 20 combined-cycle gas power plants.

The potential to mitigate peak electricity demand in Europe therefore depends on the level of household equipment in each country. In the context of energy decarbonisation, as we phase out the use of oil and gas, replacing them with wood heating, in addition to the use of electrical solutions (including heat pumps), will help reduce the risk of stress on Europe's electricity systems.

[4] Study by CleanStove (December 2023) - The Socioeconomic and Well-being Benefits of Stove Ownership and Use
[5] To find out more about Hygge, visit the "VisitDenmark" website.
[6] Results of the IFOP/Poujoulat survey (October 2022): Wood-energy, essential for the electricity system.

What is the economic contribution of the domestic wood heating sector in Europe?

The domestic wood heating sector creates sustainable jobs that cannot be relocated, especially in rural areas.

It is estimated that there are around **200,000 directs jobs in the domestic wood heating sector in Europe.**

Sector	Number of companies	Number of jobs
Forestry and firewood production	More than 10,000 companies, including 100 factories producing more than 30,000 steres every year	80,000
Pellet production	1,000 factories with an installed capacity of 37 million tonnes	20,000
Manufacture of wood-fired appliances	150 appliance manufacturers and subcontractors (foundries, glass manufacturers, refractory manufacturers, etc.)	17,000
Chimney flues & Accessories	More than 50 manufacturers, including around 100 factories	9,000
Sales & Installation	More than 10,000 companies	45,000
Servicing, Maintenance & Cleaning	More than 10 000 companies	30,000

Source: CEFACD 2024

The vast majority of the wood-logs market remains unregulated. The structuring of the sector and regulations in favour of better quality (dry) wood are leading to the emergence of new players and the potential construction of numerous production sites. Major investments are expected in this sector. There is therefore considerable potential for employment in the coming years.

WOODCUTTING
0.4 Direct and indirect jobs/1,000 steres

LOGGING & HAULING
0.2 Direct and indirect jobs/1,000 steres

TRANSPORT
0.2 Direct and indirect jobs/1,000 steres

TRANSFORMATION
0.6 Direct and indirect jobs/1,000 steres

RETAIL / DISTRIBUTION
0.4 Direct and indirect jobs/1,000 steres

Data: Renewable Energy Association - Illustration: Céric Laboratory® 2024

= 2 jobs / 1,000 steres

The potential for job creation by 2035 is estimated at 100,000 additional jobs, particularly in the development of high quality wood fuel (dry, cleaned, etc.). This massive increase in supply has another advantage: it will make it possible to drastically reduce wood consumption (by up to 30% compared with traditional fuels)[7].

Wood heating is a way of enhancing the value of forests and the work of forestry professionals.

The aim of forestry is to produce the best possible quality of wood so that it can be put to the best possible use, and to provide forest owners with the income they need to maintain the forest and preserve biodiversity.

The **quality of the wood therefore determines its price and its use**. Broadly speaking, the first use is for timber (e.g. construction, furniture, etc.), which uses straight and quality logs with a good diameter. Lower quality logs and straight branches are used for industrial wood (e.g. paper, panels, chemicals, etc.). Finally, in order to make the most of the less valuable parts of the wood and the wood by-products, wood heating is used to supplement the income form forestry.

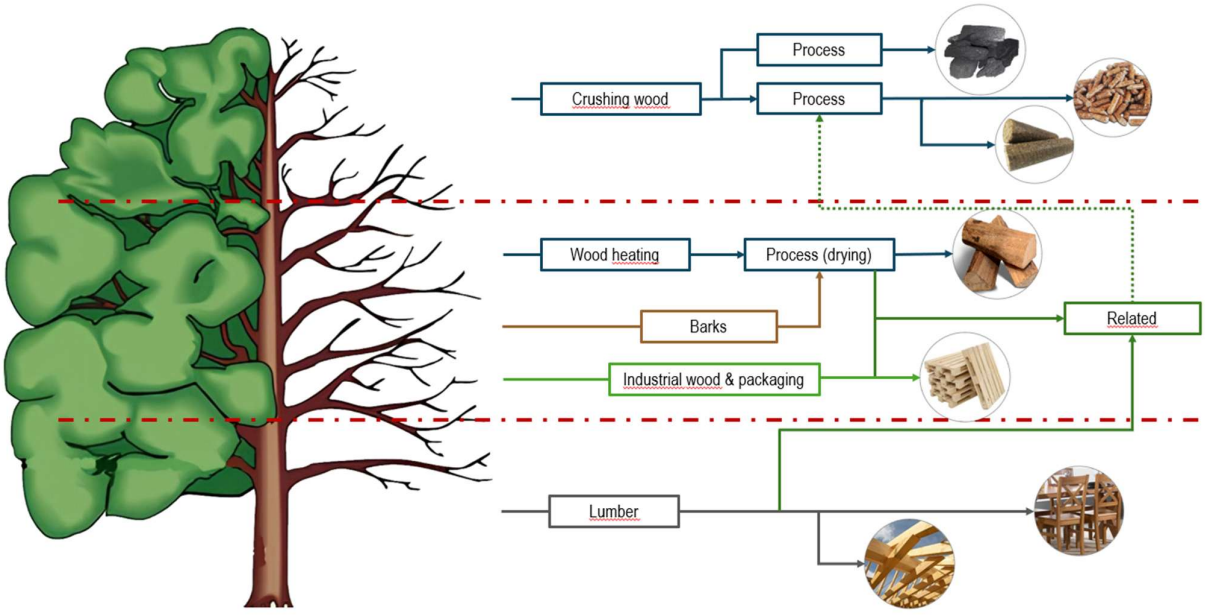


Illustration: Céric Laboratory® 2024

There's no profitable forestry without wood heating
No sawmill can be competitive and sustainable without valorising its by-products in energy (CHP, Pellets…)

Forestry operators are making increasingly costly investments.

[7] Report by the Céric Laboratory (July 2017): The impact of log wood fuel quality and changes in the number of wood-burning appliances on air quality.

Average purchase price

WOOD HARVESTER
€ 700,000

LOGGING TRUCK
€ 500,000

Illustration: Céric Laboratory® 2024

To make forestry profitable, it is therefore necessary to extract value from the entire harvest. For sawmills, recycling by-products has become a vital source of additional income.

In Europe, sawmills are located close to forests. Likewise, wood heating processing companies are located close to forestry operators and sawmills.

95% of production facilities are located in Europe

The wood heating sector creates economic wealth for European countries.

A pellet factory with a production capacity of 50,000 tonnes requires an average investment of €20 million. The same investment is required for a firewood production site with a capacity of around 100,000 steres. The industry has invested several billion Euros over the last ten years.

It is estimated that the annual turnover of the domestic wood heating sector in Europe is between €18 and €20 billion. This represents a massive contribution to the European economy and energy sovereignty.

What are the industry's commitments in terms of biodiversity and air quality?

Professionals throughout the industry are committed to meeting European quality standards. At the same time, national initiatives are taking this even further:

- **Regulations:** The entire sector is subject to a number of European standards, including the European Union Timber Regulation (EUTR) and, in the future, the European Regulation on Deforestation-free Products, which require the traceability of wood to prevent deforestation The EN ISO 17 225-2 standard provides a nomenclature for pellets. Finally, for appliances, the Ecodesign Directive and its associated regulations apply to domestic wood-fired appliances.

- **Certifications for sustainably managed forests:** there are two standards in Europe. These are the FSC® (Forest Stewardship Council®), created in 1994, and the PEFC (Programme for the Endorsement of Forest Certification schemes), created in 1999. There are other certifications in Europe, but they only apply to certain countries.

- **Labels for pellets and firewood**: The ENplus standard complies with the nomenclature of European standard EN ISO 17 225-2. There are also national certifications such as the NF standard for France and the DINplus standard for Germany.

- **Equipment quality labels:** A number of national labels, issued by private bodies or governments (Aria Pulita in Italy, Flamme Verte in France, Nordik Swan in Scandinavia, Blue Angel in Germany, etc.) are regularly reviewed. These labels are awarded on the basis of criteria such as efficiency and respect for air quality.

- **Recognition for professionals:** In France, installers can obtain the RGE (Recognised Environmental Guarantor) label. This certification is necessary to grant subsidiaries to end consumers.

Taken together, these standards are a means of improving the performance of appliances, the quality of wood fuel and the way it is used. This combination guarantees consumers better energy efficiency and fewer particulate emissions into the air.

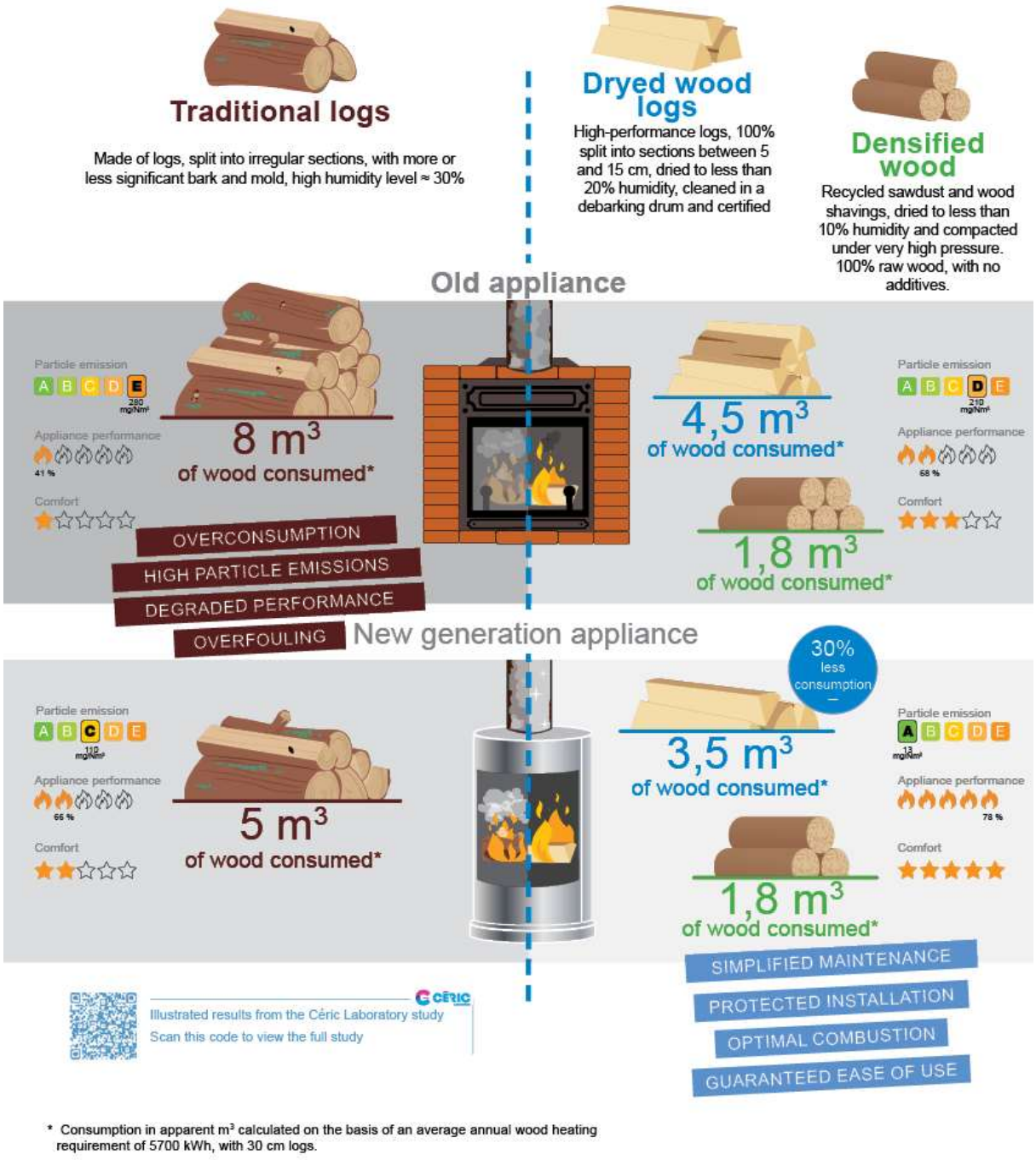


Illustration: Céric Laboratory® 2024

The results of this improvement were demonstrated in a study[8] published in the Journal of Cleaner Production entitled “Toward a cleaner domestic wood heating by the optimisation of firewood stoves?”

This analysis shows that **while new-generation appliances emit more fine particles in proportion, their emissions in terms of mass or number of particulates are significantly lower than those of older appliances**.

[8] Study carried out by the Céric Laboratory, the University of Lorraine, the Laboratory for the Study and Research of Wood Materials and the National Research Institute for Agriculture, Food and the Environment.

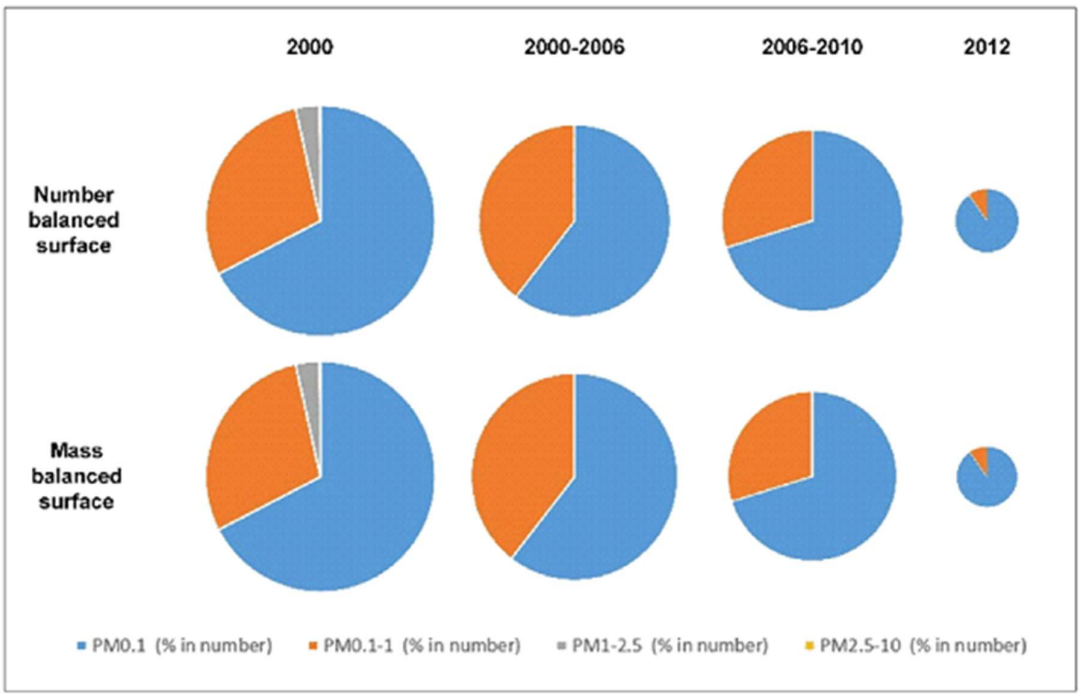


Fig. 3. Evolution of the particle size distribution according to the generation of the stove.

Illustration: Journal of Cleaner Production entitled "Toward a cleaner domestic wood heating by the optimisation of firewood stoves?"

The technical data can therefore be summarised as follows:

Types of wood-fired appliances	Average yield (NCV)	Average emissions of $PM_{2.5}$ (mg/Nm^3)
Open fireplaces	Between 10 & 15%	600 to 1,000
Old log-fired appliances (before 2000)	Between 45 & 65%	100 to 250
Newer log-fired appliances (between 2000 and 2011)	Between 65 & 70%	75 to 150
Efficient appliances (between 2012 and 2020)	Between 70 & 75%	40 to 75
High-performance and Ecodesign appliances (2020 onwards)	Between 75 & 85%	< 40
Pellet stoves	Between 85 & 90%	< 30
Wood pellet boilers	Between 90 & 100%	< 20

Sources: The French Agency for Ecological Transition and the Flamme Verte Label. Data processing: Céric Laboratory® 2024

There is a factor of fifty between the emissions of open fireplaces and those of the last generation appliances.

In summary

In Europe, domestic wood heating accounts for 18.3% of the heating energy consumed by households, which is almost equivalent to the national heating consumption from all sources of France (the 2nd most populous country in Europe with 68 million inhabitants). **Domestic wood heating is therefore an important source of heat and a major contributor to the energy mix.**

A very large number of European households have a wood-fired appliance, usually as a supplement to their main source of heating, but it can also be the main source of heating, especially in the form of boilers. Wood heating is a **source of heat that is available at all times** (even when the electricity or gas supply is cut off) and is **financially accessible**. It also allows people to adjust their consumption according to their income and comfort. In a context of rising energy costs and geopolitical tensions, this source of heat should not be overlooked.

In light of Europe's decarbonisation targets, domestic wood heating appears to be a **means of making our energy systems more resilient**. By replacing fossil fuels with another source of clean energy, mainly electricity, Europe risks increasing the saturation of its electricity grids. Let's not forget that in winter, when consumption peaks in the evening, renewable energies such as solar and wind power produce little due to a lack of sun and wind, with the risk of increased reliance on fossil fuels and a negative impact on CO_2 emissions. In the absence of a storage solution that does not reduce the cost of energy to users, the production capacity to meet demand is therefore reduced. Developing the domestic wood heating sector is therefore a lever that will allow us to overcome these challenges without threatening supply or imposing additional economic costs on households and governments.

The example set by France is particularly interesting in this respect. If the coverage rate for domestic wood heating in Europe were identical to that in France, **the potential for mitigating peak electricity demand would be more than 50 GWh, equivalent to the peak electricity consumption of the United Kingdom.**

As for its impact on air quality, all players in the domestic wood heating sector are working to improve appliances, fuels and practices to **reduce emissions of atmospheric pollutants**. This commitment also makes it possible to reduce the average consumption per appliance, thereby **reducing the pressure on the use of biomass in forests**.

The wood heating sector is working alongside forestry operators and sawmills to ensure the **long-term future of forest resources** by providing a new way of adding value to this essential raw material. The sector currently employs **200,000 people** and creates **local economic wealth that cannot be relocated**. It also has great potential to create even more jobs that cannot be relocated.

What if wood heating no longer existed?

The heating needs met by wood-energy would need to be met by another energy source. In terms of economic trade-offs and availability, a large proportion of current wood users would turn to fossil fuels.

As a result, Europe would become more dependent on imports of fossil fuels, particularly from Russia and the United States.

What's more, its CO_2 emissions would still be very high and the road to decarbonisation would be even longer, requiring significantly greater investments than are currently being made.

Finally, Europe, and ultimately its consumers, would have to pay a much higher price for energy than they do today. Tensions on the networks at peak consumption times, the need for storage and competition would all have had an impact on the cost of energy supplies and services.

Why would it be a mistake to restrict the use of domestic wood heating or introduce stricter regulations?

It would risk freezing the number of wood-fired appliances installed and limiting our ability to improve air quality.

It would make wood heating less competitive and less accessible.

It would undermine the quality of the innovative efforts of the entire European industry.

Finally, it would weaken our energy sovereignty and an entire economic sector (equipment, installation companies, fuel supply, forestry and services).

For all of these reasons, the CEFACD and all the players in the European domestic wood heating sector are proposing a growth trajectory for the number of wood-fired appliances and a projection for biomass consumption and air quality. This scenario would ensure that Europe has a resilient energy mix that limits the financial impact on users, is carbon-free and respects the environment and health. In order for this to happen, the right conditions need to be in place, and these are set out in the recommendations.

Domestic wood heating in Europe: Scenario for growth in the number of wood-fired appliances, material savings and improved air quality

The CEFACD wanted to make a European projection of the evolution of the number of installed wood-fired appliances and their impact up to 2035. To do this, it used the following available data:

- European data - Eurostat
- Government data
- Data reported by national organisations representing the domestic wood heating sector[9]
- Data from laboratories and scientific studies

The method used was developed by the Céric Laboratory, experts in chimneys and sustainable energy for over 30 years. Based on the known number of installed wood-fired appliances and annual sales, it is possible to define the evolution of these figures and their consequences in terms of biomass consumption and $PM_{2.5}$ emissions.

Three studies on changes in the number of wood-fired appliances installed in France have been published using this methodology:

- The impact of log wood fuel quality and changes in the number of wood-fired appliances on air quality - July 2017
- The impact of wood fuel quality and changes in the number of wood-fired appliances on air quality - July 2022
- Prospects for domestic wood-fired appliances: Growth and performance, lower consumption and improved air quality - September 2024

These prospective analyses have subsequently been confirmed by actual monitoring publications published by the French Agency for Ecological Transition (ADEME), which tested the projection method.

All the data presented in this document have been extrapolated by the CEFACD on the basis of analyses carried out by the Céric Laboratory covering seven EU countries representing 70% of the European population in 2022 and 75% of the number of wood-fired appliances installed. The analysis for the United Kingdom is mentioned, but the data is not included in the European analysis.

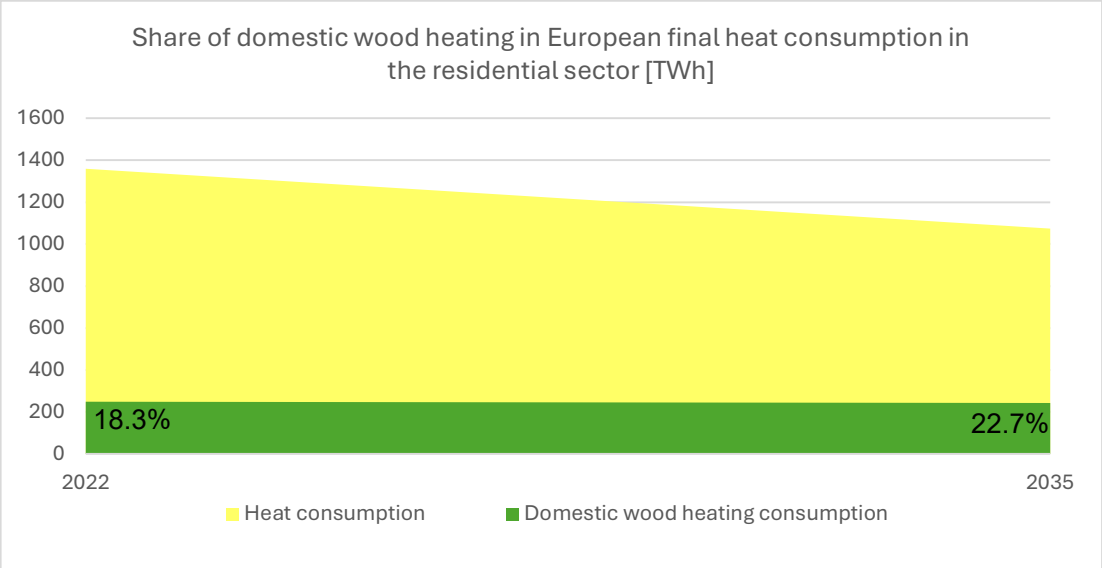
[9] Public data or data obtained from the following organisations: HKI (Germany), AEFECC (Spain), SER (France), AIEL (Italy) and SIA (UK).

Growth in the share of heat from domestic heating in total European household heat consumption

As part of Europe's energy transition, the plan is not only to decarbonise energy by eliminating the use of fossil fuels, but also to act on consumption. The energy efficiency measures adopted by all countries aim to reduce average primary energy consumption in the residential sector by between 20% and 22% by 2035[10].

At the same time, one of the aims of the transition plan is to increase the share of renewable energies in all energy sectors (heating, transport and electricity). While renewable energies are developing with the help of support from the government, they cannot, on their own, fully replace fossil fuels and cover all uses. Wood-energy is therefore an essential part of this strategy for decarbonising heating.

With the aim of increasing the number of domestic wood-fired appliances, and at the same time reducing heat consumption (temperature regulation, home insulation, etc.), domestic wood heating would maintain a good level of heat production while supplying more homes.



Source: Céric Laboratory® 2024

As a result, **the share of domestic wood heating in total heat consumption could increase from 18.3% to 22.7% by 2035**, making it possible to achieve the renewable energy targets in terms of energy consumption. In addition, **there are currently around 48.5 million wood-fired appliances in Europe. This is expected to increase to just over 53 million by 2035.** Over the same period, 75% of the least efficient appliances are likely to be replaced by 2035.

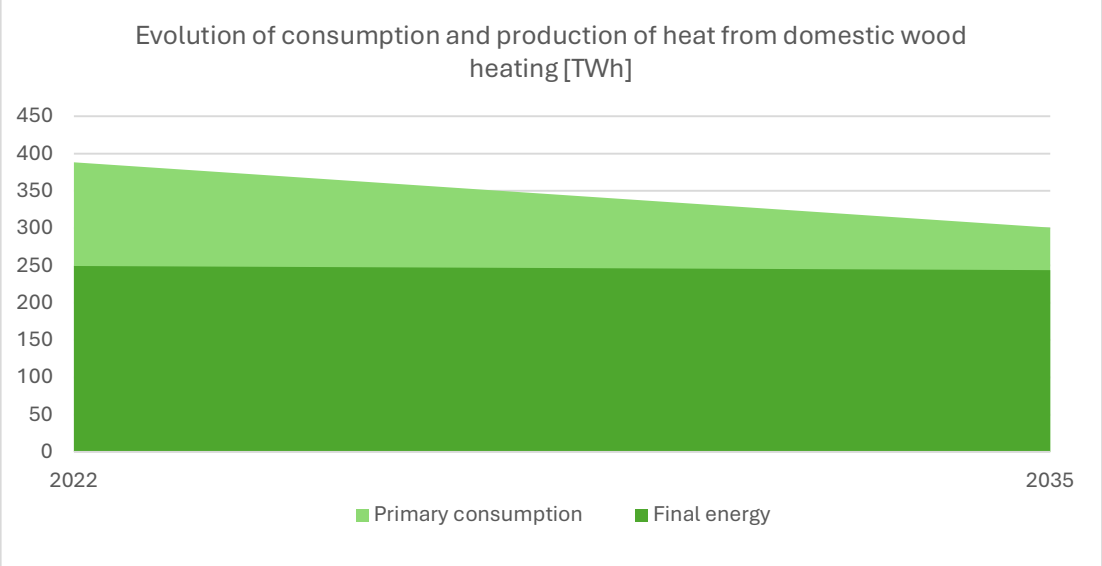
[10] European Parliament - EU fact sheets on energy efficiency.

Reduced biomass consumption

Contrary to popular belief, **the increase in the number of domestic heating appliances has not led to an increase in the demand for biomass** - quite the opposite. In fact, there are a number of factors that actually reduce consumption:

- Appliances are becoming increasingly efficient thanks to innovations by manufacturers and changes in regulations.
- Better home insulation, combined with a desire to reduce consumption, is reducing the amount of wood needed to heat households. Unfortunately, we must not forget the impact of global warming.
- New appliances are better sized and therefore consume less fuel. The quality of wood fuel is constantly improving. It is increasingly necessary to use dry wood fuel (<20% moisture content), which has a higher calorific value. It should be noted that high quality wood fuel reduces biomass consumption by 30%[11].
- Installation and maintenance are more and more professional, as is education for users. These are also levers for reducing consumption.

Total biomass consumption for domestic wood heating in Europe is currently around 388.4 TWh. This is expected to decrease by 22.5% to 301 TWh by 2035. At the same time, final energy production is expected to remain constant due to the factors mentioned above.



Source: Céric Laboratory® 2024

An unusual case: Poland

In the context of the study, almost all countries are experiencing a decline in biomass consumption. However, Poland is an exception. The Polish energy market is dominated by coal, oil and gas. The country's energy policy calls for energy savings, but also diversification of the energy mix to ensure its independence.

In this context, many Polish people are likely to turn to wood heating to replace fossil fuels, primarily coal.

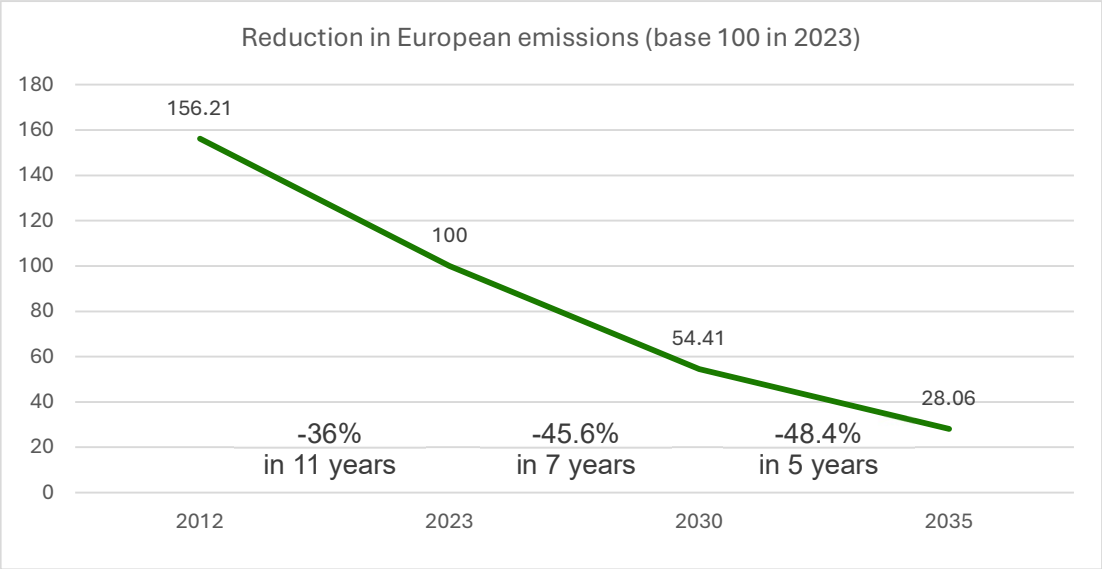
[11] Report by the Céric Laboratory (July 2017): The impact of log wood fuel quality and changes in the number of wood-burning appliances on air quality.

A reduction in $PM_{2.5}$ emissions associated with domestic wood heating

Older appliances emit much more air pollutants by volume. Replacing them with new-generation appliances dramatically reduces emissions[12]. The addition of new, efficient appliances has very little impact on total emissions from wood-fired appliances.

According to Eurostat data[13], $PM_{2.5}$ emissions from all sectors combined have already fallen by more than 53% between 1990 and 2022.

Between 2012 and 2023, $PM_{2.5}$ emissions from domestic wood heating decreased by 36%. By increasing the number of wood-fired appliances and replacing older ones, $PM_{2.5}$ emissions are expected to fall by more than 70% by 2035. Moreover, this reduction will be accelerated by the improved performance of new appliances and the replacement of older ones.



Source: Céric Laboratory® 2024

The main challenge is to reduce the proportion of older, higher-emitting wood-fired appliances. According to projections based on a study of seven European countries, the composition of wood-fired appliances park will evolve as follows:

- In 2012, there were around 47 million domestic wood-fired appliances, almost 72% of which were open fireplaces and older appliances dating from before 2000, which emit the most particles into the air.
- In 2023, there were around 48.5 million wood-fired appliances in Europe, with the least efficient appliances still accounting for 39.5% of the total.
- By 2030, the number of appliances will rise to 51 million. The most inefficient appliances are expected to account for only 18.6% of the total.
- By 2035, there will be 53 million appliances, with very few older appliances (only 5.8% of the total).

This means that air quality is set to improve spectacularly in the coming years.

[12] Study published in the Journal of Cleaner Production entitled “Toward a cleaner domestic wood heating by the optimisation of firewood stoves?”
[13] Eurostat data - Air pollutants by source sector

A look outside Europe: The United Kingdom

Until recently, the United Kingdom was a member of the European Union. The study therefore analysed the UK market to understand the specific challenges it faces. As it turns out, they are the same as those in the EU.

With the current number of wood-fired appliances at 3.8 million (2 times less than in France), the UK market will be able to grow in the coming years without increasing biomass consumption or $PM_{2.5}$ emissions.

In fact, previous analyses and projections have shown that by 2035, biomass consumption is expected to fall by around 30% and $PM_{2.5}$ emissions by 75%, even though the number of appliances installed in the UK is expected to reach 4.4 million.

The country's main challenge is to encourage the replacement of older appliances in order to meet emission reduction targets. Currently, 33% of the UK's wood-fired appliances are open fireplaces or older, less efficient appliances, which account for almost 79% of emissions.

In conclusion: What can be done to meet this challenge?

The CEFACD is committed to shedding light on the state of domestic wood heating in Europe in order to better inform the decisions that need to be made in terms of the European energy mix.

Since it is not properly identified or accounted for in the same way as electricity or gas, domestic wood heating is poorly recognised in public policies and the European energy strategy.

However, domestic wood heating is an essential link in a chain, an economic and local sector that deserves to be recognised.

Recognising the role of domestic wood heating in the European energy mix means:

- **Limiting the use of fossil fuels**. Wood heating is carbon neutral over a human lifetime. In most cases it can be used as a substitute for fossil fuels, helping to limit our carbon emissions.

- **Ensuring Europe's energy independence**. Despite the desire to reduce energy consumption, Europe will have to make massive use of all available energy sources to meet its needs. If we fail to develop wood heating, we will be maintaining the European Union's strategic dependence on the United States and the Middle East, from whom we have been importing fossil fuels, mainly gas, since Europe turned away from Russia. Wood heating, on the other hand, is widely available and sustainably managed throughout Europe, strengthening our energy sovereignty and our security as well as the solidity of Europe's electricity grids.

- **Ensuring that everyone has access to heat at a reasonable price**. This is all the more important in Europe's rural areas, where energy prices have been rising for several years. Wood heating remains by far the cheapest source of energy for households.

- **Improving sustainable forest management**. While the primary objective of forest management is to provide timber, wood heating is an inseparable part of the economic balance of the sector. If this balance were to be undermined, forestry companies would be deprived of a very important resource for fulfilling their missions, particularly in terms of making our forests more resilient and better adapted to climate change.

- **Encouraging progress to improve air quality**. The players involved in domestic wood heating are well aware of the issues of public health and climate change. As such, they are committed to ensuring that systems (appliances and flues), fuels, installation and maintenance all contribute to improving air quality. They therefore need stability and visibility to support their innovation and investment efforts.

- **Developing employment and wealth creation in Europe**. 95% of the sector's added value is in Europe. Wood heating is a way of making the best use of the forest, which will be all the more rewarding as the production of high quality wood fuels develops. By improving the structure of the sector, an additional 100,000 direct jobs could be created by 2035.

The CEFACD would therefore like to see this scenario become a reality. To achieve this, the European Union must:

Measure 1

Promote the importance of domestic wood heating in the European energy mix. Given its contribution, this energy source must be given greater prominence. The same applies to the progress made and the best practices in the sector.

Measure 2

Encourage the replacement of open fireplaces and appliances over 20 years old. This strategy will reduce $PM_{2.5}$ emissions more quickly than a ban on the use of these appliances. In fact, it would be very difficult to control the use of wood-fired appliances by users, thereby freezing the number of appliances and emissions. Furthermore, a ban on wood-fired appliances raises the question of whether the measure would be acceptable to users and the industry as a whole.

Measure 3

Promote the use of high quality wood fuels, namely labelled logs with a moisture content of less than 23% and certified pellets. It has been shown that the use of high quality wood fuel can significantly reduce both wood consumption and particulate emissions.

Measure 4

Encourage Member States to support efficient domestic wood heating. Certain measures could limit the scope for government support for wood heating in the long term. For example, the merging of energy labelling as part of the revision of the EU Ecolabel scheme could ultimately mean the end of support for domestic wood-fired appliances.

Measure 5

Support the development and professionalisation of the wood heating sector, by training professionals, educating consumers (information campaigns) and supporting innovation.

Annexes: Projections by country

All of the data used to compile the fact sheets have been provided by government and European public authorities, national organisations representing domestic wood heating professionals, and scientific studies.

These data on the number of wood-fired appliances and annual sales were used to apply the proven projection method developed by the Céric Laboratory.