



## The environmental footprint of cash activities is a cornerstone of the Banque de France's commitments

In line with the rest of the cash industry, the Banque de France is committed to reducing the environmental footprint of the banknote life cycle, from manufacture to destruction. One of the key measures in its strategy is the "Refondation" project, which covers all Banque de France cash activities and is part of a broader plan to reach net zero.

In December 2023, the European Central Bank concluded that the European cash cycle has a very limited impact on the environment. However, over the past 20 years, efforts to reduce its carbon footprint have intensified.

In France, the national retail payments strategy for 2025-30, due to be announced at the end of 2024, should include a section on environmental challenges. This will allow the Banque de France to move forward more efficiently with other industry participants, in a consolidated and coordinated manner.

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JEL codes  
Q50, Q51,  
E50, E51, E58

8 km by car

annual environmental impact of banknote payments per euro area citizen

-1,900 tCO<sub>2</sub>e

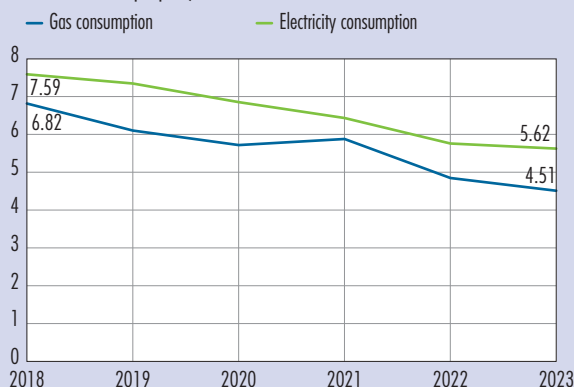
reduction between 2019 and 2023 in the greenhouse gas emissions from energy consumption at the Banque de France printing works

100%

of banknotes shredded by sorting machines are incinerated with energy recovery

### Energy consumed by the Banque de France in manufacturing secure banknote paper

(MWh/tonne of paper)



Source: Banque de France.



### 1 The greening of cash activities: a Banque de France priority

Mindful of its environmental footprint, the Banque de France has committed to lowering its greenhouse gas (GHG) emissions, and has set an initial target of a 15% reduction by the end of 2024. Its climate strategy is consistent with the framework defined by international treaties, notably the 2015 Paris Agreement. It sets out an ambitious low-carbon pathway using all available action levers, and with a first milestone at end-2024, followed by further targets for 2030. The Bank's decarbonisation strategy is also aligned with the European Union's "Fit for 55" legislative package, which requires GHG emissions to be cut by at least 55% by 2030 compared with 1990.

In 2022, the Banque de France already exceeded its 2024 reduction target relative to 2019: GHG emissions were down 23.6% over a scope comprising energy use, business travel, staff commuting, waste, and fugitive emissions linked to leaks of refrigerant gases from air

conditioning systems. In all of these areas, staff engagement is vital to ensure that best practices are applied as broadly as possible. Recent measures to achieve this include incentives to encourage the use of soft transport, and limits on heating and air conditioning use.

To reach its longer-term targets, however, the Banque de France needs to measure the environmental footprint of all its activities (GHG Emissions Assessment or GHGEA, which is governed by article L. 229-25 of the Environmental Code). Its cash activities, which include the manufacture and sorting of banknotes as well as the circulation of banknotes and coins, are industrial in nature, as opposed to its other activities which are tertiary. As a result, they **account for nearly half the Bank's total GHG emissions**, as well as having other adverse effects on the environment: depletion of natural resources, pollution, waste production, etc. These activities are therefore a major focus for the Banque de France, as they are for all cash cycle participants. In 2022 and 2023, it notably took steps to lower its energy and resource consumption, and to reduce the environmental impact of its waste treatment.

#### Box 1

#### Study to measure the environmental footprint of the euro area cash cycle

As part of its "Cash 2030" strategy, the European Central Bank (ECB) aims to ensure that cash remains an available and easily accessible means of payment, but also that it becomes increasingly sustainable. In 2019, it carried out its second study of the environmental footprint of euro banknotes used solely as a payment instrument.

It then calculated the ratio of this impact to the annual value of cash payments made by euro area citizens (aged 18 and over) in 2019.

The study is based on the European Commission's Product Environmental Footprint methodology (PEF). Its aim is twofold:

- to achieve a comprehensive knowledge of the potential environmental impact of cash activities, from raw material acquisition and manufacturing to the disposal of euro banknotes;

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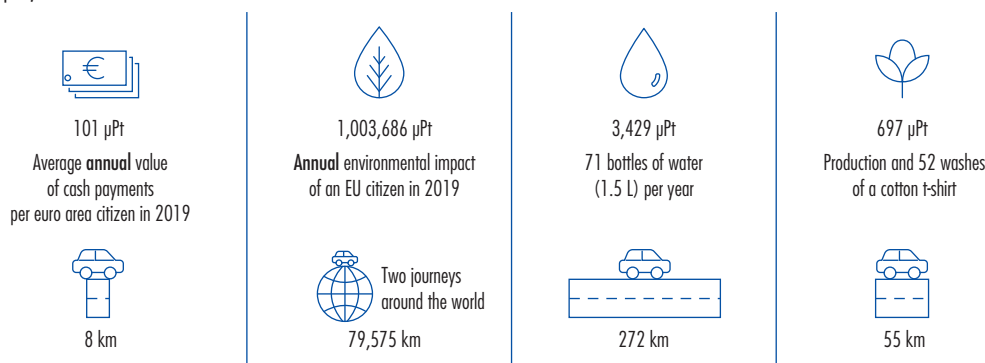
- to measure the potential environmental impact of euro banknotes as a payment instrument, to help further identify aspects in the banknote life cycle that can be targeted to reduce the environmental footprint of euro banknotes.

To carry out the study, each national central bank collected data on its activities and on those of the participants in its specific cash cycle (banks, cash-in-transit firms, retailers, banknote manufacturers). The ECB then collated and harmonised this data using a standard metric (the micropoint or  $\mu\text{Pt}$ ) to obtain a measure of the environmental footprint of banknotes.

The results show that the environmental impact of euro banknotes used as means of payment is very limited, especially when compared to that of other common consumer goods. In 2019, the estimated annual value of cash payments per euro area citizen was 101  $\mu\text{Pt}$ , which is equivalent to driving 8 km by car (and accounts for less than 0.01% of the total annual environmental impact of a euro area citizen). This was compared to other industries to put it more into perspective (see diagram).

### Comparison of the environmental footprints of euro banknotes and other common products

(micropoints,  $\mu\text{Pt}$ )



Source: European Central Bank, Product Environmental Footprint study of euro banknotes as a payment instrument.

Note: A car journey equivalent is included for each.

The study also found that the main activities contributing to the environmental footprint of euro banknotes are the powering of ATMs (37%), transportation (35%), processing activities in the distribution stage (10%), paper manufacturing (9%) and the authentication of banknotes at the point of sale (5%). Given the long lifespan of banknotes (average of nine years) and the fact that they are used for many payments, their production has a comparably lower share of impact compared with their transportation and distribution.

## 2 The Banque de France is cutting its GHG emissions through better use of energy and resources

The imperative to combat climate change means the Banque de France needs to adapt its cash activities. One of its key focuses is to optimise the use of energy and resources at each stage of the banknote life cycle – from

the manufacture of banknote paper to the printing and distribution of the final product.

### Paper manufacturing

More than a century after its creation, and following its modernisation between 2015 and 2018, the Banque de France's Europafi paper mill in Vic-le-Comte (Puy-de-Dôme



department) is continuing to transform. It is currently taking steps to green its production of banknote paper, and, between 2019 and 2023, cut its gas and electricity consumption per tonne of paper by 25% thanks to its decarbonisation plan (see Chart 1).

The plan comprises four axes:

- better management of activities, in particular through the deployment of a metering plan for each manufacturing workshop, which will enable all data to be centralised;
- increased energy efficiency to limit consumption;
- use of waste heat generated by paper manufacturing processes;
- adaptation of processes to ensure they use more electricity or low-carbon energy sources. One of the key measures in this field will be the replacement of the factory's gas boiler with a wood-fired biomass version.

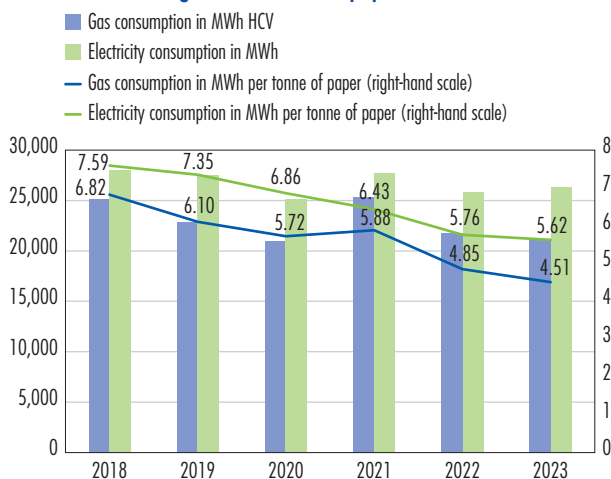
The paper mill has also taken steps to preserve water – a vital resource for its activities – by cutting its usage by 44% between 2018 and 2023. To take this even further, it now needs to find ways of directly reusing the water from the site's wastewater treatment unit, while taking into account the constraints linked to high-tech paper production.

Banknote paper is made from waste cotton from the textile industry. This cotton is mainly grown in Asia and Africa, which means it requires large quantities of water as well as massive use of pesticides and fertilisers. To preserve the environment, the paper mill has increased the share of certified sustainable or organic cotton that it buys, in line with the targets set by the European Central Bank (ECB). Since 2023, Europafi has used only sustainable cotton in its paper manufacture, and, by 2027, 100% of its cotton will be either organic or fair trade. In parallel, the Banque de France is testing the use of alternative, local fibres, such as hemp, as a potential replacement for cotton.

### Banknote printing

The printing works has also committed to lowering its electricity and gas consumption. While annual banknote output has continued to rise, the site has already exceeded its reduction target of 10%, with a 25% cut in energy use in 2023 compared with 2019 (reduction of 42% in tonnes of CO<sub>2</sub> equivalent [tCO<sub>2</sub>e] in 2023 compared with 2019). This was achieved through a number of initiatives. First, it replaced one of the three burners in its boiler room with a more efficient, new-generation model, which explains 3% of the observed reduction. Second, it improved the calibration of the workshop ventilation systems and fine-tuned the operation of the temperature and humidity control systems. These measures to optimise existing installations account for nearly half the reduction in electricity and gas use. The printing works also took steps to reduce leakages from its steam and hot water networks, installing 1,400 insulating “blankets” on the pipes. This action alone accounts for a significant proportion of the reduction in energy use.

### CI Energy consumed by the Banque de France in manufacturing secure banknote paper



Source: Banque de France.

Note: As an example, in 2023, the paper mill produced 4,688 tonnes of paper. HCV, higher calorific value.



Together, these initiatives have lowered the printing works' GHG emissions from 4,400 tCO<sub>2</sub>e in 2019 to just over 2,500 in 2023. In 2023, the site continued these efforts by investing in LEDs to cut the energy use of its lighting, optimising the performance of its cooling systems and even shutting them down at weekends, and adjusting work schedules to concentrate similar activities into shorter time spans so that it can halt production entirely for two weeks (low-consumption mode).

### Banknote distribution

A major source of energy consumption at the Banque de France cash centres is banknote sorting, which requires high-precision machinery operating in temperature-, humidity- and security-controlled environments. Following conclusive tests, air regulation specifications (which can account for up to 64% of energy consumption in sorting workshops) have been relaxed, in agreement with the sorting machine manufacturers. The temperature guidelines for the Banque de France's tertiary activities have also been applied to cash activities, which means that heating has been lowered to 19°C in winter and air conditioning is switched on at 26°C. The obligation to shut off office heating and air-conditioning at weekends has also been applied to the banknote sorting offices, albeit less stringently as these areas need to be kept at a temperature of between 15°C and 30°C in order to function correctly. Thanks to these two measures, a drop of up to 30% in energy consumption for air regulation has been observed at the industrial sites analysed.

The Banque de France's counter activity at its cash centres consists in handing over new or fit (in good condition) banknotes to cash-in-transit firms to replenish banks and retailers, and accepting banknote lodgements for sorting. Once sorted, fit banknotes are put back into circulation

while unfit ones are shredded. The fit banknotes may be supplemented by additional supplies transported by Banque de France lorries. The distance travelled and related fuel consumption fell markedly between 2022 and 2023, reflecting a decline in activity as well as the optimisation of journeys (16% drop in fuel consumption per tonne of banknotes transported).

The transport of goods for the Banque de France's sorting activities has also been analysed. Consumables used to identify and package banknotes are delivered to each cash centre in the sorting network. Some items were sourced from Germany and delivered as and when needed. At the start of 2023, these items were grouped together at a warehouse in Île-de-France, reducing the distance travelled by supply lorries by 25,430 km over the year. The initiative has made the Bank better able to cope with product shortages or peaks in activity, and allowed it to negotiate lower prices thanks to larger order volumes.

### 3 Industrial waste from the Banque de France's cash activities is increasingly being put to good use

Of the 2,200 tonnes of waste generated each year by the Europafi banknote **paper mill**, 98% is non-hazardous and is either recycled (54%) or incinerated to produce energy (44%; see Chart 2a below). The site aims to increase its material recovery rate by finding new uses for its incinerated waste. It recently began sending packaging from the cotton bales used to produce paper pulp to be recycled into insulation. The main challenge for the future is to find a sustainable way of reusing its shredded paper, which accounts for 41% of the site's waste. It is currently looking into ways of incorporating it into polymer objects or construction materials for the building industry.

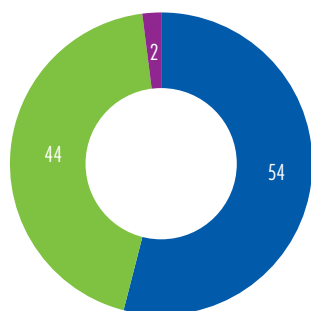


### C2 Breakdown of different methods of waste recovery at the Banque de France in 2022

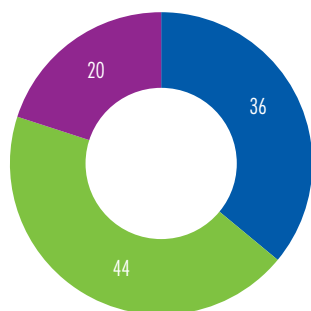
(%)

#### a) At the paper mill

- Material recovery
- Energy recovery
- Incineration with no energy recovery



#### b) At the printing works



Source: Banque de France.

The **printing works** has also made waste recycling one of the key focuses of its environmental policy. It has purchased an industrial waste evaporator which treats waste on site and only releases water into the sewer system once it has been depolluted and checked for quality. This has significantly lowered (by 50 tonnes) the amount of liquid waste that needs to be transported and treated by an external operator.

The printing works is engaged in an ongoing drive to improve its waste treatment. It is working to reduce waste incineration with no energy recovery and to instead recover materials wherever possible. For other waste

products, it uses incinerators equipped with energy recovery units. Its research and development department actively devotes resources to finding new ways of reusing the site's industrial waste. Examples of solutions include the transformation of shredded paper or banknotes into furniture or pallets, the recycling of plastic packaging into plastics, the reuse of wooden pallets in good condition, and the cryogenic freezing of ink pots to remove all residue and allow them to be reused.

At the **cash centres**, banknote sorting machines and logistical equipment (conveyers, robots, automated guided vehicles, automated warehouses, etc.) are maintained by in-house teams. Thanks to reconditioning and repairs, 134 spare parts (including motors) were given a second life between January and September 2023. By reducing waste, the transportation of new spare parts and the extraction of raw materials, these repairs generated savings of some EUR 50,000 over the period.

The end-of-life of small and large equipment has also been optimised. Useful spare parts are taken from obsolete equipment before dismantling the remaining structures for recycling. Other items that are either surplus to requirements or unusable are donated to charities. For example, the Bank has donated stackers (lifting equipment) to Emmaüs either for reuse (in the charity's day-to-day logistics), or to be sold on for profit (to finance the charity's operations).

The Banque de France now collects, sorts and stores its industrial waste before sending it on to dedicated processing channels.

It has also complied with ECB regulations on banknotes that are unfit for circulation by banning landfilling and instead incinerating them to recover energy.

On a logistical level, since March 2023, work carried out with the Monnaie de Paris (Paris Mint) has enabled coins to be delivered on much lighter wooden pallets.



### Box 2

#### Refondation: building the most eco-friendly banknote production centre in Europe

In July 2023, the Banque de France's General Council approved the launch of the "Refondation" project to build a new, modern printing works at the site of the existing factory, Europafi, in the Auvergne. The investment is being accompanied by an ambitious competitiveness plan, and should lead, by 2026, to the creation of the greenest and most state-of-the-art banknote production unit (paper mill and printing works) in Europe.

#### Reduction of the Bank's carbon footprint

Although the Bank's business plan provides for an increase in banknote production over the coming years, notably due to export orders, the new infrastructure – which will use less energy and fewer resources – should lower greenhouse gas (GHG) emissions (which accounted for 15% of the Banque de France's emissions in 2022) by 50% relative to 2019 when it becomes fully operational in 2026.

#### Responsible energy use

The project's ecodesign combines energy sobriety with thermal and visual comfort and has earned the tertiary activity areas the highest level of HQE (high environmental quality) certification. The main source of heat (gas) will be replaced with a low-carbon energy source: a "thermo-frigo pump" which is a heat pump that recovers energy and can produce both heat and cold. Water consumption will be cut by 30%, more waste will be recovered and journeys between the printing works and paper mill will be vastly reduced.

#### Preservation of biodiversity

Preserving biodiversity is a priority for this project. The site is located close to an area classified as Natura 2000, which means offsetting measures have had to be put in place to reduce its environmental impact: conservation of wooded areas, creation of meadows, relocation of a heritage plant species, creation of bat shelters, etc.). An ecologist and landscaping company have also been called in to raise awareness and help with these initiatives.

## 4 The Banque de France has made environmental challenges a pillar of its National Cash Management Policy

As a banknote issuer, the Banque de France is naturally at the heart of the French cash cycle and shares the same environmental concerns as the many other participants, notably cash-in-transit firms, banks and retailers. Each is making significant environmental efforts within its own

sphere, so it is important to have comprehensive view of how the sector is evolving in this field.

In general, since the end of 2018, the Banque de France has been working closely with the French Treasury and the cash industry (banks, cash-in-transit firms, consumer and retailer associations, etc.) to implement the National Cash Management Policy. This comprises five main axes, one of which is the industry's efficiency. Initially focused





on economic performance, this axis now incorporates an environmental component which could become an axis in its own right in the future 2025-30 national retail payments strategy (covering cash and cashless payment means). The latter is due to be validated by the National Payments Committee at the end of 2024.

Introducing this notion of environmental efficiency will make it possible to identify new collective challenges relating to the climate and better understand the cash cycle's environmental footprint. It will also help to scale up players' skills in this area, and rally the entire industry behind the urgent need to green cash activities.

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