

# CURRENCY NEWS™

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## Getting to Grips with Micro-Organisms

**At the Banknote Conference in May, Guilmar Ernesto Moncayo Ponce from the Bank of Mexico provided information about progress on the first of a three phase project looking at the presence and role of micro-organisms on banknotes.**

When the COVID pandemic happened, staff at the Bank of Mexico were sent on a three month lockdown. They noticed on their return that some banknotes in the laboratory had continued to wear while stored in the safe. This prompted the start of a study to understand how banknotes degrade, and the risk to health, due to the presence of micro-organisms.

The first phase, 2022-23, explored which micro-organisms are present. The second phase, 2023-24, is exploring the impact of those micro-organisms, and the final phase in 2025 will investigate possible mitigation.

### Which micro-organisms are present?

The study is looking for 'degraders' and pathogens. Microscopy is being used to establish presence, microbiology viability, molecular analysis diversity and biochemistry compatibility.

Banknote have been collected from bank branches at Central de Abastos, metro stations at Mexico City's two main hospitals and the city's main street market. The study

uses 200 fit and unfit cotton and polymer notes – the 20F, 50F1, 100F and 200G series of peso notes.

In order of what was found most, traces of viruses, fungi and bacteria were found, with the lower denomination notes having the most diverse collections. The pathogens identified as present did not represent a material risk. Enzymes and metabolic evidence of material degradation from these traces was found.

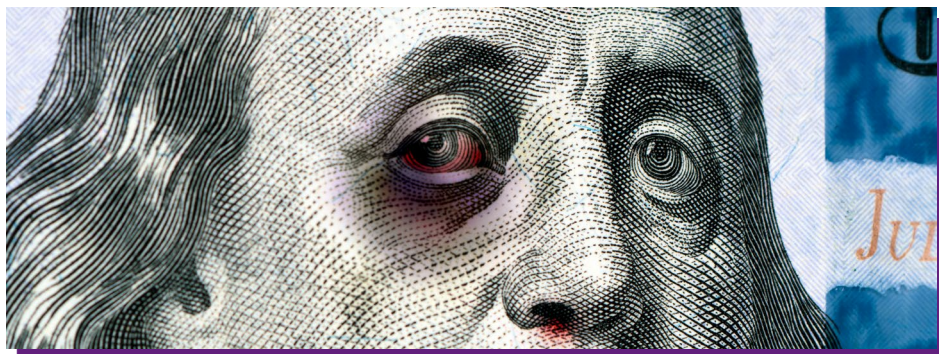
The banknote substrate determines the humidity and availability of organic matter which propagate the degradation. Most of the nutrients found came from human contact. A baseline of not less than 5,000 micro-organisms was found on all the notes.

### Impact of the micro-organisms

The scope for the second phase is now agreed. The state of wear will be established by microscopy, reanimation by microbiology, traceability by molecular analysis and degradation by biochemistry. It will look at the impact on degradation and human health.

# A Day Late and a Dollar Short?

■ By Francisco Mandiola, FMA Secure



**Is dollarisation a cure-all for unstable, hyper-inflationary nations? It is very hard to make that judgement, especially since stronger currencies, whether it be the dollar or euro, are also subject to changes in their value which may or may not benefit the dollarised economies in the short-term.**

In the year 2000, Andrew Berg and Eduardo Borensztein, economists with the International Monetary Fund (IMF), wrote an article, 'Full Dollarization: The Pros and Cons', which addressed a growing global trend amongst countries that had long histories of economic turbulence and challenging exchange rate policies.

The lure was and still is that full dollarisation, the abandonment of a local currency so that all transactions will be done in a more stable currency, generally the US dollar or the euro, would 'cure' these problems. This would also include the elimination of all local currency in circulation, a giant endeavour for any country, let alone those where cash still plays a significant role in daily transactions.

In my purview, which is Latin America, three countries have officially dollarised their economies: Panama, which has been dollarised for more than a century; Ecuador, which has just completed 24 years of dollarisation; and El Salvador, which abandoned the colón and replaced it with the dollar in 2001.

Colombia has, in the past 20 or so odd years, toyed with the idea of dollarisation but not very seriously. And although President Menem contemplated dollarisation of Argentina in 1999, more recently, President Milei made a campaign promise to 'dynamite' the Central Bank of Argentina, which included dollarisation, to jump-start his country's flailing economy. Today, however, six months into his government and with improved economic indicators, this is not such a certain scenario.

Recent history among the countries that have dollarised shows some benefits. Ecuador decided to dollarise its economy when it was going through a deep crisis, with hyperinflation of 106% in 2000 and today, despite having the highest inflation

in the last five years, at a little over 4%, they boasted several years of relatively stable inflation, with numbers as low as 0.5% per annum.

Panama adopted the dollar as its currency in 1903, eliminating exchange rate risks, but their economy was and is very closely tied to the United States, which makes their results not necessarily repeatable in other countries.

In the case of El Salvador, where more than 40% of its residents are actually living and working either in the US (more than 80%) or elsewhere, economists had to take into consideration that nearly 20% of El Salvador's GDP was already in dollars paid into the country as remittances made by Salvadorean emigrants, clearly a very good reason to dollarise.

Nevertheless, one should note that in both Ecuador and Panama, dollarisation meant a rise in the cost of living, as well as a progressive de-industrialisation with increased unemployment, and forced the nation to survive largely on exports.

Some countries in the region, although they have not officially dollarised their economies, have what is known as partial dollarisation. This means they keep their currencies and the management of foreign exchange policy by their central banks even though consumers and businesses prefer to effect most transactions in dollars. Clear examples are Venezuela and Perú, where many do not trust the value of their own currency for mid- to long-term transactions.

Unfortunately, the history of dollarisation is still relatively recent except for the case of Panamá which is not comparable to other countries. Moreover, dollarisation will not avoid the risk of external or internal crises, especially since local and foreign investors may decide to flee from a country because of political or financial problems that may

raise questions regarding the soundness of the nation's financial system with or without dollarisation.

For full dollarisation to work well, nations would need to align their monetary policies to become dependent on, in the case of the US dollar, on the Federal Reserve (Fed), and this dependency does not always translate well for local economic realities. Particularly in the case of recessions, a nation would not be able to counteract drops in exports or boost its economy from the management of interest rates or issue additional currency responsibly when needed to finance public spending.

Finally, it is a well-known fact that productivity is variable amongst all countries and this will not be changed by eliminating its currency. Since the decision to dollarise is usually made when a nation's currency is highly depreciated in value, the corresponding exchange rate for the dollar would be quite negative for many of the nation's inhabitants unless they have the means of being paid in dollars from abroad or have a miraculous jump in productivity, a highly unlikely circumstance in most cases.

Dollarisation is defined as the process whereby the US dollar is de facto adopted as the currency of a country, and the central bank and government do not issue their own currency. Partial dollarisation is when the dollar is accepted and circulates alongside the domestic currency.

Dollarised countries procure their banknotes from the Fed but not the coins. So whilst Ecuador, El Salvador and Panama are fully dollarised, they still issue their own coins – the sucre, the colón and the balboa respectively. The coins are all equivalents of their US counterparts.

Similarly, Timor Leste, which has been fully dollarised since 2000, has issued its own centavo coins since 2003, again on a par with US coins.

A similar principle applies to sovereign states that are officially 'eurorised', namely Andorra, San Marino, Monaco and Vatican City, all of which have monetary agreements with the EU granting them the right to produce limited quantities of euro coins with their own design on the national side, but not to issue euro banknotes.

Kosovo and Montenegro also use the euro as the de facto domestic currency, albeit without an agreement with the EU. This is keeping with an older practice of using the German mark, which was previously the de facto currency in these countries.



## Q&T Secures Further Contract for Vietnamese Currency

**Q&T Hi-Tech Polymer (Q&T), the latest arrival to the polymer substrate market, has announced that it has made remarkable progress since its establishment three years ago by securing its third contract for supply of Polysecure for the Vietnamese currency.**

Despite being a Vietnamese company, Q&T still had to undergo rigorous testing and evaluation by the State Bank of Vietnam (SBV) and the National Banknote Printing Plant (NBPP) to qualify as a supplier for the recent tenders. Successfully meeting the requirements for the 10,000 and 50,000 dong denominations, including the challenging diffractive optic element, showcased the capabilities and expertise of the Q&T team, the company said.

Through its partnerships with both the SBV and NBPP, Q&T now contributes to the Vietnamese currency on the 10,000, 20,000, and 50,000 dong notes. The latest contract is for one year, with the SBV committed to tenders going forward to ensure the best quality and price.

Before the arrival of Q&T, CCL Secure was the sole supplier to Vietnam, which began replacing all its paper notes with polymer in 2003 – one of the first countries to do so. Vietnam currently has six denominations in the series – which, in addition to the above, include 100,000, 200,000 and 500,000 dongs.

Commenting on this latest contract, Q&T Chairman, Anh Luong Ngoc, expressed his gratitude to the SBV and NBPP for placing their trust in Q&T. ‘With Q&T’s Polysecure polymer substrate, the future of Vietnamese currency is in safe hands’, he said. Q&T’s ambitions extend far beyond Vietnam, however. ‘We are dedicated to elevating the standards of the polymer substrate market and establishing ourselves as a trusted and leading player in the industry’, he added.

## RCM Among Canada’s Best Corporate Citizens – Again

**The Royal Canadian Mint (RCM) has once again been ranked among Corporate Knights’ Best 50 Corporate Citizens in Canada. The ranking is based on 24 quantitative key performance indicators relating to resource management, employee management, financial management, clean revenue, clean investment and supplier performance.**

This is the seventh time the RCM has made the rankings. For the 2024 version of the award, it ranked sixth overall, placing first among metal products manufacturers and second in the Metals & Mining category.

The RCM’s inaugural Impact Report was published in May, accounting for its 2023 environmental, social and governance (ESG) performance by both reporting progress and achievements, as well as acknowledging areas for improvement.

It used the Impact Report to provide an update on its Task-force on Climate Related Financial Disclosures (TCFD) obligations. Included in the TCFD update is a mint-wide climate-related risk assessment that, says the RCM, will help it integrate and monitor climate change risks and opportunities in its enterprise risk management system.

It has also developed a decarbonisation roadmap to make circulation coinage manufacturing carbon-neutral by 2030, which includes the implementation of geothermal technology to heat and cool its Winnipeg facility.

And in its quest to continually improve its ability to responsibly source precious metals, the RCM has implemented distributed ledger technology to track the provenance and custody of gold entering its refinery (see CN March 2024).

Moreover, it is maintaining a strong focus on recirculating existing coin inventories and recycling coinage, as a result of which 88% of coins placed into circulation through the operation of its national coin management system are re-circulated, requiring only 12% of coin demand to be fulfilled by new coin production.

## ‘BNSx’ Strives to Achieve Excellence at Koenig & Bauer

**Koenig & Bauer, in its report on its first quarter results, gave further details of its Spotlight programme, launched earlier this year to prioritise initiatives and business models that boost earnings and financial strength, deprioritise initiatives that do not directly impact earnings and optimise the group and segment organisation as well as the indirect cost structure to make processes even leaner and more customer-friendly.**

The company reported revenues of €253.2 million, 9.9% lower than in the first quarter of the previous year, and EBIT fell by €7 million to €-10.2 million. Contributing to this was the Special segment, which includes Banknotes Solutions, and which saw revenue fall by 17% year-on-year to €80.6 million and EBIT from €900,000 to a loss of €5.6 million, primarily due to the lower percentage of completion (POC) achieved in production for customer orders.

As previously reported, the Banknote Solutions business had a very strong 4th quarter last year in terms of order intake due to a major order from the Bureau of Engraving and Printing, but for the first quarter of this year, this fell back by 41.8% to €54.1 million. Even so, as the year continues, the segment will benefit from the high order backlog of €352 million (versus €249.3 million the previous year).

In his role as the Management Board member responsible for the Special segment, Dr Stephen Kimmich, Group Chief Financial Officer and Deputy Chief Executive Officer, will lead the BNSx efficiency and earnings-enhancement project as a further key component of the Spotlight project. The focus is on implementing measures to increase profitability and earnings in order to return the Special segment to its original above-average performance in the long term.

Following the completion of major R&D projects, the BNSx project, with the Group’s commitment to the banknote market, aims to optimise the operational value-creation structures at the site in Mödling (Austria) and the overall responsibility of the business unit in Lausanne (Switzerland), as well as various support and specialist functions in Würzburg (Germany).

In addition, further measures are to be adopted to accelerate the successful market launch of the technologies developed in the Special segment over the past five years and to scale these accordingly.

## People in the News

■ The Federal Council of Switzerland has appointed **Martin Schlegel** as the new chairman of the governing board of the Swiss National Bank (SNB). He succeeds **Thomas Jordan** at the helm, who is retiring after more than 12 years in the position.

■ **Beth M Hammack** has been appointed the new President and CEO of the Federal Reserve Bank of Cleveland. Formerly with Goldmann Sachs, she replaces **Loretta J Mester**. Elsewhere, the Federal Reserve Bank of Atlanta has named Cheryl Venable as First Vice President and Chief Operating Officer, replacing **André T Anderson**.

■ **Thomas Scholler** is joining Orell Füssli Security Printing as Director of Operations. He was formerly Production Manager with the Austrian banknote printer OeBS and replace **Andreas Brunner**, who is retiring.

■ Crane NXT has announced the appointment of **Michael Mahan** as President of its Crane Payment Innovations (CPI) business, with responsibility for 'driving the CPI growth strategy, accelerating innovation, and leveraging the Crane Business System to drive continuous improvement and operational excellence to deliver solutions that meet customers' needs now and into the future'.

He will report directly to **Aaron W Saak**, President and CEO of Crane NXT, and replaces **Kurt Gallo**, who is retiring.

■ **Susan van Wijk** has rejoined the Royal Dutch Mint as Managing Director, having previously served as Business Unit Director until she left in 2022 to join academia. She succeeds **Vincent van Hecke**, who sold the business to Heimerle + Meule earlier this year.

■ OneBanx, a shared banking solution provider and GLORY Group company, has announced the appointment of **Javed Anjum** as its new Chief Executive Officer. Javed will replace founder **Duncan Cockburn**.

## News in Brief

### ■ New King Charles Notes Auction

The Bank of England has now put into circulation the new series of notes bearing the portrait of King Charles III. It has become a tradition in the UK that with each issue of a new banknote, a group with low or 'lucky' serial numbers is set aside for sales at a charity auction conducted by Spink & Son in London. The first of four such auctions, which took place on 5 June, the day of issue, was for the new £5, one of which sold for £11,000, as did an uncut sheet.

Two weeks later, at the auction for the new £10 notes, one sold for £17,000. The remaining two auctions for the £20 and £50 notes will take place in July.

### ■ Cennox Launches i.nk+

Cennox, a banking and retail services business, has announced the global launch of i.nk+, its latest solution for intelligent banknote neutralisation systems, which represents a fusion of ink staining cassette technology with a cloud-based platform.

The company claims that i.nk+ offers a comprehensive suite of features tailored to enhance attack detection while enabling real-time monitoring, analytics, and asset management. As such, it enhances security for ATMs and cash-handling devices and is a gateway to an interconnected IBNS ecosystem.

The new i.nk+ cassette includes an upgraded staining system that ensures superior ink coverage across banknotes and has the highest number of security certifications among competing products, says Cennox.

In addition, i.nk+ has been released with a cloud-based interface. This portal serves as a single access point to provide complete visibility over all products deployed in the field. The customers will have access to real-time data, receive timely upgrades and maintenance, benefit from advanced analytics, and troubleshoot issues remotely. Moreover, it is reported to significantly lower operational costs.

### ■ Jamaica Turns Away Foreign Coins

The Bank of Jamaica (BOJ) will no longer exchange Canadian, British or euro coins at its banking counter with effect from the beginning of July.

As a part of its banking services offered to the public, the BOJ facilitates the

exchange of specified foreign currency banknotes and coins for Jamaican dollars, viewing this as a public good.

But it says that in recent years it has become increasingly challenging to offer this service for non-US dollar foreign coins, due to the unavailability of options for their repatriation to their respective issuing central banks. As a result, after giving value for these coins at its banking counter, the BOJ cannot obtain value in return, it says.

The BOJ continues to accept and exchange US, Canadian, British, and euro banknotes, as well as US dollar coins.

### ■ European Physical ATM Attacks: Numbers Up, Losses Down

The European Association for Secure Transactions (EAST) has published a European Payment Terminal Crime Report covering 2023 which highlights a rise in ATM related physical attacks.

ATM related physical attacks were up 24% to 4,637 incidents. Within this total, ATM Theft (Rip-out/ATM Burglary In-situ) attacks were up 5% to 506 incidents and Explosive Attacks were down 2% to 714 incidents.

Losses due to ATM related physical attacks were €9 million, an 18% decrease from the €11 million reported during 2022. 61% of these losses were due to Explosive Attacks, which were down 19% to €5.36 million.

ATM malware and logical attacks were down from 31 to 7, and all the reported attacks were black box attacks. A black box attack is the connection of an unauthorised device which sends dispense commands directly to the ATM cash dispenser, to 'cash-out' or 'jackpot' the ATM. Most such attacks remain unsuccessful, and total losses of just €66,847 were reported.

Terminal related fraud attacks were down 30% to 7,115 incidents. This decrease was primarily due to a fall in cash trapping at ATMs. These attacks decreased by 33% to 4,795 incidents.

Relay Attacks continued to occur with 63 cases reported during the year, down by 87% from the 502 such attacks reported in 2022. The successful attacks resulted in cash out at ATMs. Total losses of €173 million were reported, down 14% from the €200 million reported in 2022.

Most losses remain international issuer losses due to card skimming, which were €146 million.

# Central Banks and Cash Round-Up

After a gap, this month we return to the periodic series of articles covering cash information in central bank annual reports, with news from Bahrain, Bangladesh, Bhutan, Bosnia and Herzegovina, Denmark, the ECB, Ghana, Nepal, Philippines and Saudi Arabia,

## ■ Central Bank of Bahrain (CBB)

The value of currency in circulation reached BD 668.5 million on 31 December 2023, of which coins and notes amounted to BD 23.1 million and BD 645.4 million, respectively. The upgraded Fourth issue of the BD 20, BD 10 and BD5 new series (introduced in 2016) accounted for BD 575.9 million, amounting to 89.2% of the total value of currency notes in circulation.

## ■ Bangladesh Bank (BB)

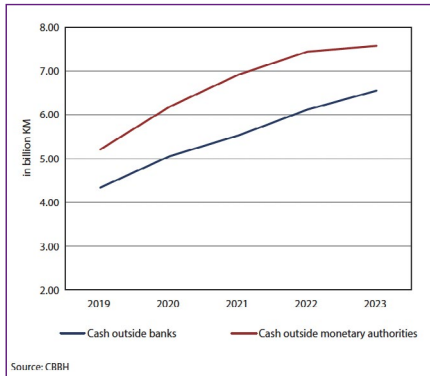
Notes in circulation increased by 21.86% to BDT 3,101.56 billion in FY23 from BDT 2545.23 billion in FY22. Notes in circulation are backed by BDT 88.35 billion in gold and silver, BDT 2,287.45 billion with approved foreign exchange, BDT 693.56 billion with government securities, BDT 2.3 billion with taka coins and BDT 29.88 billion with other domestic assets.

## ■ Royal Monetary Authority of Bhutan (RMA)

A moderate dip in Currency in Circulation (CiC) growth of 7% (Nu 942.1 million) contributed to a declining monetary base. In FY 2022/23, the CiC was recorded at Nu 12.577 billion as of June 2023 compared to Nu 13,520 million in June 2022. The growing popularity of digital payment platforms, especially the evolution of digital payment, resulted in a fall in demand for cash holdings in the economy.

## ■ Central Bank of Bosnia and Herzegovina (CBBH)

**Currency in circulation:** the growth of cash in circulation (outside banks) from previous years continued in 2023. By the end of the year, the balance of cash in circulation outside banks amounted to KM 6.54 billion, 6.8% higher than in 2022. However, unlike previous years, the trend of strong growth outside the CBBH has slowed to 1.73%, the lowest recorded since the establishment of the CBBH in 1997.



Cash outside monetary authorities and banks – 2019-2023.

In 2023, 12 million banknotes and 14,570 coins unfit for circulation were destroyed.

**Counterfeiting:** in 2023, 350 counterfeited convertible mark banknotes were recorded, 53.5% higher than in 2022. 423 pieces of counterfeit coins were recorded, 10% down on 2022. The most common counterfeits were the KM 100 banknote and the KM 1 coin.

## ■ Danmarks Nationalbank (DKK)

**New series:** a new series of banknotes with enhanced security will go into circulation in 2028-29. The series will comprise 50, 100, 200 and 500 krone banknotes (the 1,000 krone will not be

replaced) and, when issued, will replace the current banknotes over a number of years. Banknotes from the 1997 and earlier series will no longer be legal tender after May next year. Neither will the current 1,000 krone.

The 1,000 krone is being dropped because it is not essential for payments (only 1 in 10 cash payments are in values over DKK 500, and only about 1 in 4 citizens has used the note for payment in the past year). Furthermore, the police estimate that the note is used more than other banknotes in financial crime. It is also the most counterfeited denomination.

Pending the launch of the new series, the existing notes have already been, or will soon be, upgraded.

DNB will establish at least two exchange points to recall older and 1,000 krone banknotes for those unable to exchange these at banks or currency exchange bureaux. The exchange points are expected to open by the end of 2024, and will accept recalled banknote until May 2026.

**Cash in circulation:** the value of banknotes and coins in circulation fell by 9.2% to DKK 68.2 billion in 2023. Of these, DKK 62.1 billion were in banknotes, which fell by 9.8%, and DKK 6.1 billion were in coins, which fell by a more modest 1.6%.

The fall was a continuation of the pattern seen in 2022 and an effect of the move to digital and online payments, along with restrictions on exchanging Danish cash abroad and limits on cash payments.

The recall of the older banknote series (those from 1944-1997) and the phasing out of 1,000 krone banknotes also impacted the amount of cash in circulation. By the end of the year, the total volume of banknotes under recall and being phased out totalled DKK 22.6 billion. In the first month of the recall alone, the circulation of these banknotes decreased by DKK 1.9 billion.

As the 1,000 krone banknotes began to be recalled in December, demand for 500 krone banknotes increased. Nevertheless, the circulation of these fell by DKK 235 million over the year. The circulation of the 50, 100 and 200 krone banknotes was relatively stable during the year.

DNB closed the sale of coins and banknotes via the Royal Danish Mint's coin webshop in December 2023 due to a decline in demand and the costs of handling and distribution (the Mint itself ceased producing coins in 2016).

**Counterfeiting:** the number of counterfeit banknotes detected rose from 1,452 in 2022 to 2,163 in 2023, of which 1,547 were found in circulation. They were mostly the 1,000 krone. The counterfeit ratio was 8.7 ppm.

## ■ European Central Bank (ECB)

**Legal status:** ensuring adequate access to and acceptance of cash, in June last year the European Commission adopted a proposal for a regulation on the legal tender of euro banknotes and coins. Good access to and acceptance of cash are the critical components of the Eurosystem 2030 cash strategy to ensure that euro cash continues to be widely available as an attractive, reliable and competitive means of payment and store of value.

**Cash in circulation:** at the end of 2023, the circulation of euro banknotes reached 29.8 billion pieces with a value of €1.57 trillion. The value of euro coin circulation grew by 3.2% to reach €33.5 billion at the end of 2023, equivalent to 148.2 billion coins.



## ... Central Banks and Cash Round-Up

**Sustainability and quality:** the ECB conducted a product environmental footprint (PEF) study of euro banknotes to assess the environmental footprint of a person's yearly cash payments. The findings showed that the footprint of a person's annual use of euro banknotes is equivalent to driving 8km by car and accounts for only 0.01% of their total yearly environmental impact related to consumption activities (see CN April 2024).

To ensure the quality of euro banknotes, Eurosystem national central banks processed 25.3 billion euro banknotes and replaced 3.3 billion worn-out banknotes with new ones.

**Counterfeiting:** some 467,000 counterfeit euro banknotes were withdrawn from circulation in 2023, one of the lowest levels ever in proportion to total banknotes in circulation, with a ratio of 16 ppm (see CN January 2024).

**New series:** the ECB is now preparing to develop a new series of euro banknotes. Based on the outcome of two public surveys in the summer of 2023, the ECB governing council selected 'European culture' and 'Rivers and birds' as two possible themes. The Governing Council has established an advisory group to propose motifs that could illustrate the selected themes by the end of 2024. After that, a competition will be held to design the new banknotes. European citizens will again have the chance to express their preferences on several design options. The ECB is expected to decide in 2026 on the final designs and when to produce and issue the new banknotes.

**Digital euro:** the preparation phase for the digital euro project started in November, following a two year investigation. This will lay the foundations for the potential issuance of a digital euro. The ECB is keen to reassure the public that digital euro would complement cash, not replace it.

### ■ Bank of Ghana (BoG)

**Currency in circulation:** this saw a significant surge in 2023. The value of banknotes increased by 22.73% to GH¢43.67 billion, while coins in circulation almost doubled to GH¢879 million. The Bank spent GH¢675.4 million on note printing, a 107.4% increase from 2022.

**Currency management:** the BoG invested in improving currency operations in 2023 and installed two additional BPS M7 machines at the Kumasi Regional Office, bringing the total number to eight. In addition, in line with the Bank's Clean Note Directive, which requires all depository institutions to examine and circulate only fit banknotes, the BoG certified several banknote sorting and authenticating machines.

### ■ Nepal Rastra Bank (NRB)

**Currency in circulation:** banknotes in circulation increased by 1.2%, reaching the value of Rs 640 billion.

**Currency management:** the Master Plans on Note Printing (Purchase) and Coin Minting have been updated as per the provisions in the Public Procurement Act, 2063, and Nepal Rastra Bank, Currency Printing and Coin Minting Guidelines, 2065 (First Amendment, 2075).

Materials and technologies used in the printing of current banknotes were upgraded to enhance their lifespan, quality and security.

466.25 million new banknotes of various denominations were issued. Unfit banknotes worth Rs60.4 billion were destroyed.

Under NRB's strategic plan to modernise the cash management system, equipment and software for note counting, verification, and processing was installed. The Note Chest Transaction System (NCTS) is being implemented concurrently with the existing system to facilitate the real-time reporting of note chest transactions by

commercial banks.

An education programme was conducted to raise awareness among priests, small shop owners, and transportation workers, among others, regarding the Clean Note policy and other prevailing legal provisions related to cash handling.

An eight-member study task force was formed to study the requirement for minting machinery and equipment. The team has completed the study and submitted the report to the NRB governor.

### ■ Bangko Sentral ng Pilipinas (BSP)

**Currency production:** the BSP's currency production deliveries reached ₱781.6 billion in banknotes (1.9 billion pieces) and ₱10.3 billion in coins (1.8 billion pieces) in 2023, representing 0.9% and 46.4% year-on-year increases respectively. The production deliveries complemented the Bank's existing inventory of physical currency to service the economy's demand.

From April 2022 to December 2023, the BSP also completed the delivery of 500 million 1,000 polymer banknotes.

**Currency issue:** banknote and coin withdrawals from banks in regional offices and branches (ROBs) rose by 6.1% in value but declined by 8.6% in volume, indicating that people withdrew more high-denominated currencies during the year. Banknote and coin deposits in ROBs increased in value and volume by 11.7% and 7.1%, respectively. Total banknote and coin retirement in ROBs rose by 4.4% in volume and 4.7% in value. This naturally followed the increase in banks' unfit banknote deposits.

**Counterfeiting:** in 2023, the volume of counterfeit banknotes (59,080 pieces) and coins (7,290 pieces) in circulation remained stable at 12.2 and 0.2 ppm, respectively.

**Digitisation:** two cash-related digitalisation initiatives during the year were:

- Integrated Currency Management System (ICMS), designed to modernise currency management in the Philippines, ensuring efficiency and resilience in handling currency operations nationwide. In 2023, the deployment of the ICMS was expanded to BSP ROBs (the ICMS was introduced in April 2019 but was limited to the Greater Manila Regional Office).
- Coin Deposit Machines (CoDMs), introduced to address the artificial coin shortage and promote efficient coin circulation in the country by encouraging the public to deposit their idle coins in exchange for e-wallet credits or shopping vouchers. The CoDM project was initially launched in June 2023 for three sites: by the end of October 2023, 25 units had already been deployed in several mall sites in Metro Manila and nearby cities. As of 31 December 2023, the CoDMs had collected ₱350.1 million worth of coins in various denominations, equivalent to 105.7 million pieces.

**Sustainability:** the report also mentioned a study commissioned by BSP from the De La Salle University (DLSU) Center for Sustainable Development Research to analyse the carbon footprint and life cycle of 1,000 piso polymer and paper banknotes. The study showed that the polymer banknote exhibits a lower carbon footprint than the paper banknote by 38.4%.

### ■ Saudi Central Bank (SAMA)

Currency in circulation fell by 2.2% compared to a fall of 0.9% the previous year. In Saudi Arabia, one crucial element is seasonal trends of currency in circulation. Currency in circulation usually records its highest levels during the festive (Ramadan, Eid al-Fitr and Hajj) seasons, which move through the Gregorian calendar but have coincided with the second and third quarters of the last few Gregorian years.

# Reasons to Introduce a New Series or Upgrade

■ **By Antti Heinonen, former Chairman of the Banknote Ethics Initiative (BnEI) and former Director, Banknotes of the ECB**

The frequency of the introduction of a new series or an upgrade was addressed in the April issue of *Currency News (New Banknote Series – Challenging the Convention)*. In this article, Antti Heinonen continues the debate by addressing the topic from a historical perspective.

It is an old saying that banknote issuers must be at least one step ahead of the counterfeiters, and indeed from the beginning notes have been developed in pace with the counterfeiting threats. There have been times when issuers have been able to relax for decades, but also periods when innovations in reproduction technology have forced paradigm changes in banknote security.

Nevertheless, counterfeiting threats are not the only reason for an introduction of a new note series or an upgrade. Monetary or political reforms, user requirements, costs and the prominence of banknotes as a state business card have gained further importance over the course of time.

## Early developments against counterfeiting

Early banknote issuers used watermarked paper, which was not readily available to the public, different typefaces and ornaments, reliefs, seals and vignettes in printing their notes. Intaglio printing was introduced early on as an alternative to the other main printing method, letterpress. Over the years new printing methods more suitable to high volume security printing were developed, as well as new methods for engraving the plates, which made the notes more difficult to imitate.

A new printed security feature – the guilloche – was introduced in the early 19th century. Then it was almost impossible to imitate the notes using the methods available and no major upgrades were needed for decades. As an extreme example, the design of the British white fiver, the £5 note, required only minor upgrades between 1809 and 1956. For an international currency the stability of the design was a virtue.



The £5 note required only minor upgrades between 1809 and 1956.

The measures introduced by mid-19th century were generally successful against counterfeiting until photography was invented and photographic techniques were brought into play by counterfeiters. These techniques forced a paradigm change in banknote security during the second half of the 19th century. Print colours, which were more difficult to imitate – like the green in US dollar notes ('greenbacks') or azure blue and rose in French notes – were introduced, together with special antiphotostatic inks. Furthermore, coloured fibres and planchettes were incorporated into the paper. In addition, owing to the developments in intaglio printing, the registration of the inks became so good that it was extremely difficult to imitate the banknotes.

Over the following 100 years or so, improvements in banknote security were largely attributable to advances in printing methods and machines. No changes to prevent counterfeiting were generally needed for several decades. For example, the Swedish 100 krona banknote remained almost unchanged between 1896 and 1964. Similarly, following the standardisation of the size and design of US Federal Reserve notes in 1929, there were no significant changes until the 1990s.

Again, stability was and is an important aspect for an international currency. But there were also other long-lived designs with minor upgrades like the Argentinian 5 peso note between 1899 and 1958 or the Danish 500 krone note between 1910 and 1962.



The Swedish 100 krona note remained almost unchanged between 1896 and 1964.

Also, other banknote designs might have lived longer, but hyperinflation after World War I and monetary reforms after World War II led to changes. All European countries which took part in the latter war, except Great Britain and Italy, implemented a monetary reform sooner or later after the war. All these post-war monetary reforms included the substitution of the existing banknote series with a new one, if only to change the colours.

However, when there was time enough to develop a new series, many issuing authorities used the opportunity to give the new series a fresher look which better reflected the aspirations of the time. Achievements and personalities in arts and science displaced classical and societal motifs.

When a new series with a fresher look had been introduced, many currencies again had long-lived designs. Examples are the Australian 10 dollar note with only minor design changes between 1966 and 1993, the Chilean 1,000 peso note between 1978 and 2009, the German 20 mark note between 1961 and 1991, the Finnish 5,000 markka between 1955 and 1986, and the Hungarian 100 forint note between 1947 and 1997.



The Hungarian 100 forint note needed only minor changes between 1947 and 1997.

However, monetary and political reforms weren't restricted only to the aftermath of World War II. They have been a popular reason for the introduction of a new series or an upgrade during the last half century or so.

## Impacts of political and monetary reforms

When considering the frequency of the issuance of a new note series or an upgrade one might be surprised by how large the role of political and monetary reforms has been.

One of the first actions of independent states is to have their new status mirrored in the major business card, the design of the currency. It takes time to establish the authority to issue the notes, and often it is first the government, then a monetary



## ... Reasons to Introduce a New Series or Upgrade

agency or authority and only finally the central bank. All these changes are reflected on the design of the notes, often only by an upgrade of the series with a text indicating the new issuer.

Besides establishing an issuing authority, many new states have renamed the currency so that it better mirrors their culture. In many cases, the new name has been introduced simultaneously with the new note series, but sometimes the old colonial currency is used first. Accordingly, after the notes of a new independent state had first been nominated in the colonial currency eg. franc, the name has later been changed to ariary, dinar, dirham, ouguiya, syli or zaire. The pound has been later changed to cedi, dalasi, kwacha, naira, pa'anga or rand. All these monetary reforms have then been mirrored on the notes.

Let us look at the numbers. Currently, we have a good 150 central banks and monetary authorities which issue their own currency, not reckoning with those central banks which share a common currency or use an external currency (mainly the dollar or euro). However, the number of central banks was still fewer than 60 before the 1950s. So, a huge number of political and monetary reforms has taken place in between, which has brought about a great number of new note series or upgrades. Table 1 describes these developments during various decades since the 1960s.

Decade	New issuing authorities	Other monetary or political reforms	In total
1960s	62	22	84
1970s	54	27	81
1980s	31	16	47
1990s	53	38	91
2000s	12	16	28
2010s	5	8	13
2020s	3	3	6

Table 1: Changes to currencies over the decades due to political and monetary reform.

The high figures in the 1960s and 1970s were based particularly on the birth of new independent states in Africa. Nevertheless, the highest total amount of changes occurred in the 1990s. This reflects mainly the collapses of Soviet Union and Yugoslavia and the fall of communist regimes in Eastern Europe.

Correspondingly, the large number of other monetary or political reforms in the 1990s mirrors the renaming of currencies due to high inflation eg. Yugoslavia had five monetary reforms and Angola and Brazil three. Every monetary reform meant that a new note series was issued and sometimes even a provisional series by overprinting the earlier one. Furthermore, several of the new independent states born from the Soviet Union and Yugoslavia introduced first a provisional currency in a form of a coupon before establishing a more permanent solution.

The deaths of heads of state or monarchs has had no major impact on the numbers. First, not only did Elizabeth II but also some other monarchs reign for an extensive period. Second, even if there are currently a good 20 issuers which use portraits of a head of state or monarch on most or all their notes, not all of them use the current incumbents. It also takes time to design the new notes. Quick introductions of new notes have occurred mainly when the portraits of rulers like Idi Amin, Reza Pahlavi and Saddam Hussein have been replaced.

Since the 2000s the number of new issuing authorities and other monetary or political reforms have rapidly decreased. In the 2020s

new notes have been issued so far by only three new issuing authorities, namely the Central Bank of Eswatini, Saudi Central Bank and Central Bank of United Arab Emirates.

Correspondingly, monetary reforms with implications for banknotes have been implemented in Sierra Leone and Venezuela, and a succession change in United Kingdom (notes featuring King Charles III have now been issued by the Bank of England).

As an interim conclusion, when comparing the issuance of new note designs during different periods, one shouldn't forget the role of political and monetary reform, even if security has through the decades been the main reason for a new series or upgrade.

### Frequency of enhancing the security of banknotes

Earlier examples have shown that up to late 1980s it was not unusual that a banknote design could have a lifetime of 20–30 years or even longer. However, around the same point of time new threats were looming on the horizon – threats that would trigger an even greater paradigm shift in banknote security than the invention of photography.

As known, the new threats were caused by the launch of colour copiers in the late 1970s and the proliferation of inkjet printers and innovations in digital imaging and printing technology from the 1990s onwards. These new threats necessitated the development and incorporation of new security features into the notes, particularly optical features such as holograms, micro-optic structures and special inks, which are difficult to reproduce. Furthermore, a real paradigm shift in the thinking about banknote substrates was caused by the development of polymer resulting with also other innovative substrate solutions.

The response of many issuing authorities to these new threats was to be prepared to shorten the lifetime of the notes. This new thinking was reflected in the 1993 report of the National Academy of Sciences to the US Treasury which concluded that 'every feature should be viewed as having a finite lifetime, since the threat will continue to evolve as reprographic technology continues to advance and the social environment changes'.

One of the two strategies the Academy addressed was 'A proactive strategy to currency design ... in which new features are incorporated in anticipation of future threats, before a large increase in counterfeiting occurs. Relative to the reactive strategy, this approach employs a much lower threshold of tolerance.'<sup>1</sup>

The Eurosystem had a similar attitude and started the preparations for the next euro series even before the launch of the euro notes in 2002. The same thinking was mirrored also in the 2011 report of the Bank of Canada describing the move to polymer banknotes: 'because central banks usually undertake the development of a new note series only at intervals of eight years or more...'<sup>2</sup>

Table 2 addresses the introduction of new note series or upgrades during the last 40 years. Included are only introductions where the main reason to change has been security – even if, as often happens, the central bank takes the opportunity to fulfil other purposes.

Accordingly, the changes described in Table 1 are excluded, even if they may have enhanced the security of the notes. Second, in this ranking of reasons security has been considered the main reason even if the change has been used to improve, for example, user requirements such as reducing the size of notes or adding features for the visually impaired.

If known, the date for the introduction of a new series or an upgrade has been used, not the date printed on the notes. Often the dates printed on the notes refer to a decision or law, which might have been made several years before the actual introduction of the notes.

<sup>1</sup> <https://nap.nationalacademies.org/read/2267/chapter/1#xi>

<sup>2</sup> <https://www.bankofcanada.ca/wp-content/uploads/2011/06/spencer.pdf>



Evidently, there is the question of what differentiates a new series from an upgrade? In most cases an upgrade is easy to define. The same overall design has been retained and only one (or several) new security features have been added. Or if the design has been retained but it is printed on a new substrate. Even if the sizes of the notes have been changed, but the design retained, it is classified as an upgrade, if it has enhanced the security.

Several central banks even make the classification easy because they number or name their note series. In such cases upgrades are limited to only change of the colour of one note which has created confusion with another one or a mistake in the design or copyright issues with photographs used in the design or similar.

There are also three different issuance scenarios – all at once, in two phases or staggered. The benefit of introducing all denominations at the same time is useful for several stakeholders, eg. because machine operators are not obliged to upgrade their machines for each new denomination. It is also useful from the point of view of communications about the new notes.

However, this approach is more demanding if the volumes are large, and therefore many issuers do the introduction in two phases or more or less staggered. The benefit is that not being obliged to produce all notes for a certain date, they can be upgraded continuously.

In case the new series or upgrade has been issued crossing two periods in Table 2, it is included in the period when the issuance began. Furthermore, sometimes a series commemorates a certain event or person. However, if it is issued for permanent circulation in significant volumes, it is included because it has enhanced security.

Period	New series	Upgrades	In total
1985-1994	84	55	139
1995-2004	73	90	163
2005-2014	76	68	144
2015-2024	59	43	102

Table 2: New series and upgrades from 1985-2024.

The message of Table 2 is clear, even if the last year of the current decade is still ongoing. Introductions of new series or upgrades had its peak in the period 1995-2004 and has since then decreased in two consecutive decades. This means that the average lifetime of a note series is increasing.

Two reasons are evident as mentioned in the CN April issue. The continuous efforts of the banknote industry have increased both the durability and security of the notes. Their current level provides confidence to the issuers against the counterfeiting threats even if the reproduction technology is continuously developing. Furthermore, sustainability is a more recent reason to increase the lifetime of a note series.

Based on Table 2 it is useful to go still one step deeper to the problematics and consider the average lifespan of recent security upgrades.

**Average lifespan of recent security upgrades**

The lifespan of recent security upgrades of 161 issuers – including central banks, private banks (one issuing bank from each of Hong Kong, Macao, Northern Ireland and Scotland) and governments of British Crown Dependencies and Overseas Territories etc. – has been studied. From each issuer the two latest security upgrades have been considered and the longer lifespan has been selected.

For example, if an issuer last enhanced the security of their notes in 2018 and before that in 2007, the lifespan of the latter series or upgrade has been selected (ie. lifespan of 11 years). If the issuer has staggered the introduction of the new series or upgrade, the

lifespan of each denomination is counted, and the average is used. Sometimes, only a few denominations, eg. the high denominations, are security upgraded, which evidently has an impact on the average lifespan of the whole series. However, the lifespan of new higher denominations or replacement of low denominations with coins because of inflation are not taken into account in the calculations. The results are presented in Figure 1.

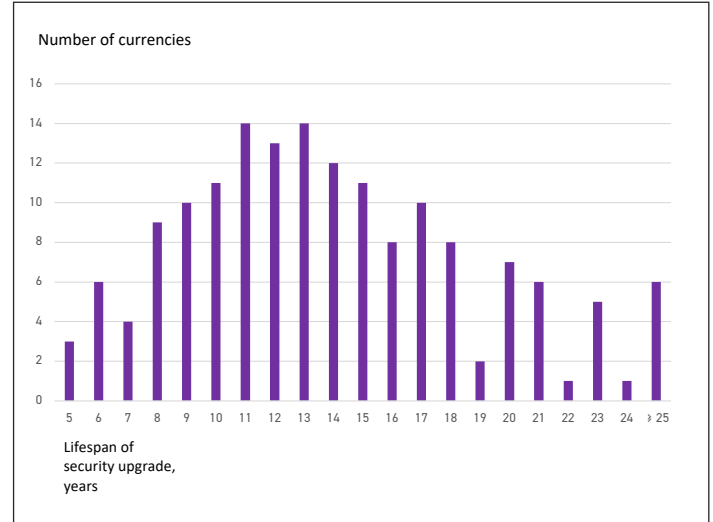


Figure 1: The lifespan of recent security upgrades of 161 currencies.

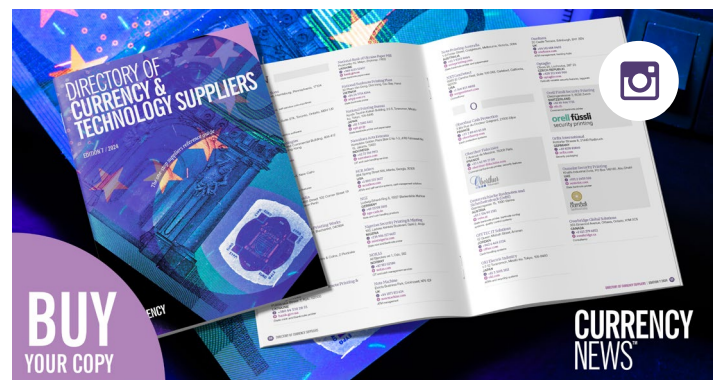
Figure 1 is in line with the conclusion of CN April issue. According to most recent developments the median lifespan of a security upgrade is 13 years. Figure 1 also shows that the perceptions of issuers regarding the counterfeiting threats differ significantly from each other. There are issuing authorities which can live with a lifespan of close to 20 years between security enhancements of their banknotes. On the other hand, there are issuers which prefer to make security upgrades of their notes in less than 10 years.

**Concluding remarks**

This article has addressed the reasons for issuing a new series or an upgrade. Even if the political and monetary reforms had a major impact on the developments during the second half of the 20th century, the main reason, not surprisingly, has been the security enhancement of the notes. The constant efforts of the industry have provided good opportunities for this. The issuers can select between various substrates and use several different optically variable features to make the reproduction of the notes difficult.

Furthermore, the issuers can mix the substrates and feature portfolio and use different issuance scenarios.

Most important, however, is that the issuers base their policy on the challenges they have to address, be they security, durability, costs, environmental sustainability, business continuity, or the impacts to stakeholders.



# New Zealand Marks 25 Years of Polymer Banknotes

New Zealand adopted polymer banknotes in 1999. At the time, Brian Lang was Head of Currency at the Reserve Bank of New Zealand (RBNZ). To mark the 25th anniversary of polymerisation, we sat down with Brian to discuss the rationale behind the transition and assess its results.

**Q:** Why did New Zealand adopt polymer banknotes?

**A:** There were several reasons. Australia had already issued a polymer series and evidence from there was showing polymer banknotes were stronger, cleaner, and more cost effective. Critically, they were also far more secure against counterfeits. Australia had originally developed polymer banknotes in response to the significant counterfeit risk that accompanied the proliferation of advanced imaging and printing technologies. While New Zealand didn't have a major problem with counterfeit banknotes by international standards, forgeries were still a nuisance and added cost to management of the cash cycle.

At the RBNZ, we were in the process of strategically reviewing all operations, and the evidence appeared to show polymer offered a wide range of benefits with no major drawbacks.

Ultimately, that has proven to be the case.

**Q:** How was the transition to polymer banknotes managed and staged in New Zealand?

**A:** We started with the \$20 banknote in May 1999. This was by far the most common banknote, making up more than half of all notes in circulation. By March 2000, the remaining denominations had all been converted. Since then, a second series has also been launched on polymer.

**Q:** How did the first polymer series compare to the previous cotton-paper banknotes, in terms of design and security features?

**A:** New Zealand had issued a new series on cotton-paper substrate not long before, in 1991/92. When we launched the polymer notes, we retained the same note size, portraiture, and other key features. So, the new notes were familiar, but they had important differences, too.

The most notable change was that there were two new windows which could be viewed from either side of the note – which helped aid public recognition and prevent counterfeits.

Other security features included intaglio, offset, letterpress and micro-printing, as well as intricate patterns, visible and invisible fluorescence and phosphorescence, and metallic ink.

**Q:** How did the public respond to the introduction of polymer banknotes?

**A:** The response was very positive.

Media reports centred on the fact polymer banknotes can be recycled, the hygiene benefits of their non-absorbent surface, and the fact they can survive being put through the wash.

Public surveys conducted in November 2000 also showed a high degree of acceptance, with 74% of the public and 90% of retailers preferring or strongly preferring the polymer notes.

The same survey showed 90% of the public and 100% of retailers considered polymer to be cleaner than cotton-paper, while 93% of the public and 100% of retailers agreed that polymer banknotes retain their quality longer.

**Q:** How have polymer banknotes impacted durability and issuance costs over time?

**A:** Let's stick with the \$20 banknote as an example. The most recent data from the Reserve Bank of New Zealand shows it lasts 4.8 times longer in circulation than the prior cotton-paper banknotes. This reduces the number of notes that need to be printed, which in turn lowers issuance costs.

Even immediately after the transition, the savings were clear. While upfront costs were higher, these were recouped within a few years, thanks to the durability of polymer banknotes.

To put this in context, the issue cost per note in circulation decreased by 58% between 1997 and 1998, when all notes were issued on cotton-paper, and 2000/2001, when the transition to polymer was fully complete. And there were additional savings on top of this too.

The fact that polymer retains its integrity longer negated the need to continuously check notes for fitness, and this allowed the RBNZ to scale down its involvement in distribution. We began to operate predominately as a wholesale supplier, saving millions of dollars by closing processing centres.

With polymer, the processing burden is a lot lower. Before we transitioned, in 1997/98, RBNZ processing machines removed 57% of all notes in circulation because they'd become unfit. After the switch, in the three years to 2007, that number had dropped to an average of 12%.

An overall estimate in 2007 found switching to polymer had already saved the RBNZ \$23 million in issuing costs, while downstream costs in terms of cash operations during distribution had produced savings of \$81 million.

**Q:** Were there any major challenges in other parts of the cash cycle?

**A:** No. There were very few hurdles. In terms of cash handling systems like ATMs, for example, converting the entire system took about one month. It only required a minor software upgrade, and this was mostly completed by branch staff in commercial banks. In fact, one of the main ATM servicing companies reported a 50% decline in fault call-outs.

**Q:** So, overall, would you say New Zealand's polymer banknotes have been a success?

**A:** Yes. The evidence clearly shows polymer banknotes are stronger, more secure, cleaner, greener, and more cost-effective.



First polymer series (series 6) above and current series (series 7) below.

*The views expressed are those of the author, and do not necessarily represent the views of the Reserve Bank of New Zealand.*



# France Working Hard on End-to-End Cash Sustainability

The Banque de France (BdF) bulletin 250, article 5, describes its work on environmental sustainability<sup>1</sup>. The paper offers up a model for others to consider detailing BdF’s work on areas it controls directly, banknote paper and printing and its cash centres, and its collaborative work with others in the cash cycle. While some will not have the resources to build new facilities, the paper is full of specific changes of every size and type which others could consider.

In 2018 BdF developed its National Cash Management plan in conjunction with the Treasury, commercial banks, cash in transit (CIT) companies, consumer and retail associations. It is this plan which has driven its work to date and by the end of this year a new National Retail Payment Strategy 2025-30 will be in place that should include a section on environmental challenges.

In 2023 BdF launch its ‘Refondation’ plan to build a new print works.

## ■ Progress to date

### BdF overall

BdF set itself a Green House Gas (GHG) emission target of reducing emissions by 15% between 2019 and 2024. This was consistent with the 2015 Paris Agreement and aligned with the EU’s ‘Fit for 55’ legislative package which aims to reduce GHG by 55% by 2030 compared with 1990.

By 2022 the BdF had reduced GHG emissions by 23.6% across energy use, business travel, staff commuting, waste and fugitive emissions linked to leaks of refrigerant gases from air conditioning. It used incentives to encourage staff to use ‘soft’ transport and put limits on how much its facilities were heated or air conditioned.

The measurement of its GHG emissions was governed by article L 229-25 of the Environmental Code.

50% of the BdF’s GHG emissions come from its activities relating to banknotes. As a result, this has been a major area of focus. In 2022 the focus was on reducing energy and resource consumption. In 2023 the focus was on reducing the impact of waste treatment.

### Banknote paper mill

The mill developed a decarbonisation plan with four key elements and a number of supporting initiatives:

- Better management of activities: this was achieved by a metering plan for each manufacturing workshop that centralised all data
- Increased energy efficiency
- Use of waste heat generated by the paper manufacturing process
- Adopting processes that use low-carbon energy sources, in particular replacing gas boilers with wood fired biomass boilers.

Water usage has been reduced by 44% between 2019 and 2023 and the focus is now on how to reuse water taken from the wastewater treatment unit.

Since 2023 all cotton used in making banknotes has come from sustainable sources and by 2027 it will all be either organic or fairtrade cotton. The mill is also investigating using locally sourced alternative such as hemp.

mWh/te of paper	2018	2023	% change
Gas	6.82	4.51	-34%
Electricity	7.59	5.62	-26%

In 2023, the paper mill produced 4,688 tonnes of paper.

### Printworks

Between 2019 and 2023 GHG emissions from the printworks have been reduced by 1,900 tonnes of CO2 equivalent (tCO2e) – from 4,400 tCO2e to just over 2,500, a 42% reduction. The energy target was to reduce energy use by 10% compared to 2019. This has been achieved by three initiatives:

- One of the three boilers has been replaced with a modern version. This alone accounts for 3% of the reduction.
- The workshop ventilation system has been calibrated and improved so that temperature and humidity can be fine-tuned. This accounts for 50% of the reduction.
- Leakages of steam and hot water has been reduced by installing 1,400 insulating blankets on pipes.

New initiatives include investing in LED lights, optimising cooling systems (including shutdowns at weekends) and adjusting work schedules to concentrate similar activities into shorter time periods, allowing a two week complete shutdown.

### Cash centre and distribution

A 30% reduction in energy consumption has been achieved by focusing on heat and humidity. Temperature guidelines that had previously been used in tertiary areas have now been applied in the banknote sorting areas. Space is heated to 19°C in winter and cooled to 26°C in summer. At weekends heating/air conditioning is now turned off in all areas, although in banknote sorting areas temperatures are controlled to be between 15-30°.

The distance travelled and fuel used by CITs moving banknotes to and from cash centres has been reduced by 16% in 2022 and 2023 because fewer banknotes have been moved and because of route optimisation.

A change has been made to how consumables are bought, stored and distributed. Previously each site was responsible for their own. This has now been centralised into one site and suppliers are then delivered as required. The benefits have been:

- 25,430km reduction in travel
- More resilience to cope with peaks and troughs in demand
- Lower prices through bulk purchasing.

100% of shredded banknotes that have come from the sorting machines have been incinerated with energy recovery.

### Industrial waste

The paper mill creates 2,200 tonnes of waste each year:

- 98% is non-hazardous
- 54% is recycled
- 44% is incinerated for energy
- 2% is incinerated but without energy recovery.

The work now is to find new uses for the incinerated waste, for example using the packaging from cotton bales in insulation. 41% of the waste is shredded paper and the mill is looking at whether it can be used in plastic objects or as a building material.

1 L’empreinte environnementale des activités fiduciaires au cœur des engagements de la Banque de France | Banque de France (banque-france.fr)

## ... End-to-End Cash Sustainability

In the printworks:

- 36% of material is recycled
- 44% is incinerated for energy
- 20% is incinerated.

The printworks has purchased an industrial waste evaporator that treats waste, allowing wastewater to go to drains that is not polluted and that has been checked. The result is a 50% reduction in liquid waste that was previously transported to be treated externally.

The printworks is looking at whether shredded waste can be turned into furniture or pallets, recycling plastic waste, reusing wood pallets and cryogenic freezing of ink pots to remove all ink residues so that the pots can be reused.

The cash centres maintain all machinery in-house. Between January and September 2023 134 spare parts were given a second life, thereby reducing waste, transportation of spare parts and the extraction of raw materials. This saved €50,000. Obsolete equipment is scavenged for spare parts and other surplus equipment is given away to charities or sold for a profit.

Cash centre waste is now collected, stored and bulk moved to dedicated processing facilities.

Since March 2023, working with Monnaie de Paris, coins have been delivered on much lighter wooden pallets.

### Refondation Project

In July 2023 the decision was taken to build a new, modern printworks to be open by 2026. One of the goals is to reduce GHG emissions by 50% by 2026. It is being designed with energy and thermal efficiency at its heart.

The main source of heat will be a low carbon energy thermos-frigo pump, a heat pump to recover energy producing both heat and cooling.

30% less water will be consumed, more waste recovered and the distance between the paper mill and the printworks will be much reduced since they will be co-located.

### Final word

Although many central banks and companies are working on sustainability, it is unusual to see such this level of detail about the progress being made and the work being done. Oberthur Fiduciaire has also been a leader in this area, so clearly the French cash sector is taking environmental change seriously.

# Enterprise Cash Management Limited Unveils ECM™ – Centralised Control

In last month's issue of Currency News™, we covered the rebirth of CPS and its new strategy for sustainability, flexibility and digitisation driven by data for the banknote fitness sorting and authentication sector. As part of this strategy, CPS has worked with its sister-company Enterprise Cash Management (ECM) to develop ECM™ – Centralised Control, which was launched at the Banknote Conference in May

According to ECM, which specialises in cash management software solutions, this next-generation analytics platform is designed to transform the cash supply chain by providing unparalleled visibility into the end-to-end cash cycle, enhancing insights with advanced analytics models, and improving data accuracy and performance related to banknote processing equipment.

As such, says the company, ECM – Centralised Control represents a significant leap forward in cash management technology, offering a robust platform that delivers real-time data and analytics to optimise the efficiency and security of the cash cycle.

Key features of ECM – Centralised Control include:

- **End-to-End Cash Cycle Visibility:** comprehensive oversight of the entire cash supply chain, from issuance to destruction, ensuring every stage is monitored and managed effectively.
- **Advanced Analytics Models:** state-of-the-art analytics can be leveraged to derive actionable insights that can drive strategic decisions, improve operational efficiency, and reduce costs.
- **Enhanced Banknote Data:** detailed data regarding banknote performance, including wear and tear, circulation patterns, and counterfeit detection, ensure the highest standards of currency integrity.
- **Process Performance Metrics:** the performance of banknote processing equipment from any manufacturer can be monitored and evaluated, enabling the identification of areas for improvement and ensuring optimal operation.
- **Equipment Manufacturer Agnostic:** like all ECM solutions, ECM – Centralised Control can work with data from a wide variety of equipment manufacturers including both CPS and G+D processing machines.

'We are thrilled to introduce ECM – Centralised Control to the market,' said Jamie Cockerell, Managing Director of ECM. 'Our new analytics product is a game-changer for the cash supply chain, offering unprecedented visibility and insights that empower our clients to achieve greater efficiency, security, and cost savings. We are confident that ECM – Centralised Control will set a new standard in the industry.'

ECM was formed with the specific objective to drive forward innovation, having been spun out of the cash processing specialist CPS last year.

This strategic move marks a significant milestone, allowing ECM to focus exclusively on software innovation and operate as a dedicated software company, free from the constraints of a hardware-centric business model.

Reflecting on the new structure, Jamie Cockerell said: 'we formed ECM a little over a year ago, and that time has been transformational, with the results of the new structure plain to see with the launch of the new technology today. With a renewed vision and clear mandate, ECM is positioned to lead the industry in developing advanced software solutions that address the complex challenges of cash management.'

The formation of ECM signifies a deliberate and strategic effort to harness the power of technology and drive progress in the cash management sector, he noted, adding that clients can expect a seamless transition and continued excellence in service delivery as ECM builds on the strong foundation established by CPS.

ECM is headquartered in the UK, with a global footprint of technical specialists, developers, analysts, project managers and consultants in nine countries around the world. Its software products and services are sold to financial institutions, central banks, and commercial organisations worldwide and are in use at 150 cash processing centres across 30 countries.



# Shake, Rattle and Roll – Diametryx’s Innovative Colour Change Particles

At the Optical & Digital Document Security™ (ODDS) conference in Lisbon this April, Michael Natan, President of Diametryx Inc, presented his new company’s intriguing colour-change particles in which the effects change not only by tilting, but shaking as well.

Natan has an impressive track record of inventing novel security taggants on the sub-micron scale, with a string of patents dating back to a first priority date in 1999. He co-founded Nanoplex Technologies to commercialise the technology. The company went through a series of acquisitions and name changes before the process was eventually bought by SICPA, through its acquisition of Cabot Security Materials in 2014.

He is one of three founder-directors and funders of Diametryx, which was set up in late 2022 and is based in the Boston University Photonics Center.

Diametryx is developing a family of micro- to nanoscale colour-changing particles, which it calls Janus particles (after the Roman god of opposites). The particles can change colour through one of three activation mechanisms: magnetism, mechanical agitation (ie. shaking) or tilting.

For the latter two activation modes, the particles return to their original colour by the force of gravity. To be more specific, the compositions are described as asymmetric magnetochromic particles (M), gravity-responsive optically variable particles (G) and wobble particles (W). Natan characterises these particles as ‘easy-to-read features with new effects in unlimited colours that can go anywhere and be rapidly upgraded’.

## The three types of particle

Regardless of the activation stimulus, each Janus particle comprises differently coloured sections. Every particle in a carrier is oriented so that only one of the colours shows to the viewer but, when activated, the M and G particles rotate, and the W particle wobbles, to show the other colour. There is an almost infinite choice of colour pairs that can be produced, including white.

The M and G particles are contained in an optically clear outer shell – referred to as yolk-shell particles

(because they look like an egg yolk within the shell) – within which they are free to rotate. Within this shell the M particles – which are currently sized from 1 to 50 microns ( $\mu\text{m}$ ) – have a tiny magnetic particle attached to one side at the boundary of the two colours, so it rotates when a magnetic field (from, for example, a simple handheld magnet) drags it round.

The G particles have a denser, therefore heavier, lower half, thus their natural state shows the colour of the upper half, which changes when agitated (shaken, tilted or jerked) but reverts to the original position afterwards. They are smaller, between  $1\mu\text{m}$  and  $10\mu\text{m}$ .

The W particles are differently shaped, with a distinctive top and bottom, making them asymmetrical on one axis, where the curved lower part is wider than the top, so the particle can rock on its base.

Diametryx anticipates supplying the particles as a powder or in a concentrated dispersion medium, so that they can be incorporated into the user’s chosen carrier, which might be a fluid, such as an ink or coating. The size of the particles can be determined to suit the user, but can be small enough to be used in most types of printing.

Natan advised that the company is on course to have demonstration prototypes by the summer. These will be shown to potential ‘route-to-market’ partners – companies active in the security printing sector with the ability to incorporate the Janus particles into their security print components.

Diametryx anticipates initially producing the particles itself, but recognises that to produce bigger quantities (assuming market success) it will need to work with a larger manufacturer.

This ODDS paper was the first airing of these new particles in a security document setting, and Natan reports that the presentation has led to substantial post-conference interest.

## A New Approach for Detecting Counterfeit Coins

**Researchers at the Centre for Pattern Recognition and Machine Intelligence (CENPARMI) at Concordia University in Montreal, Canada have utilised image-mining techniques and machine learning algorithms to identify flaws in counterfeit coins, enabling greater detection of fakes.**

Published in the journal Expert Systems With Applications, the researchers’ paper details the use of image technology to scan both genuine and counterfeit coins to look for anomalies that may be two- or three-dimensional, such as letters or portraits featured on the coin<sup>1</sup>.

The paper’s lead author, CENPARMI postdoctoral fellow Maryam Sharifi Rad, noted that the framework is not only about safeguarding economy and resources but also ‘pushing the boundaries of technology and improving security’.

The researchers’ framework is built around fuzzy association rules mining, utilising artificial intelligence to find similar patterns that are ‘fuzzy’, ie. unclear enough to be exact copies. While numerous studies have explored various approaches for mining images and extracting strong association rules, there is still a critical gap in leveraging fuzzy associative classifiers for counterfeit coin detection, using coin image datasets.

This approach begins with the examination of coins provided by law enforcement agencies and suspected of being counterfeit using state-of-the-art scanners. The scanned images are then segmented into regions of interest, which consist of collections of localised coherent regions referred to as ‘blobs’. These blobs are recognised based on visual similarity and composition, which provide relevant features the researchers can extract, and act as clues to help them figure out what is happening in the scanned images.

Fuzzy association rules mining uses these blobs to extract frequent patterns from the images, with the blobs playing a crucial role in generating the former and aiding in image classification tasks. The patterns extracted capture relationships among the blobs’ attributes, such as colour, texture, shape, and size. The patterns help researchers better understand the images and tell whether a coin is authentic or counterfeit.

<sup>1</sup> <https://www.sciencedirect.com/science/article/abs/pii/S0957417424004421>

# Equinox: On the Cusp of Change

Koenig & Bauer Banknote Solutions (KBBNS) has run its 'Equinox' customer event in parallel with the DRUPA print conference and through into June. It has used the event to showcase what it does, to launch a number of new developments, particularly its AKTINA™ product, and to make the case for thinking about banknotes, and banknote printing differently.



At one level there is a problem that the value added by printing processes has reduced, but at a more fundamental level KBBNS highlights that the banknote itself has become less valuable to society. Equinox presented a different future, a future where both printing and the banknote add value and banknotes meet modern societal needs.

The cash ecosystem consists of the banknote product, the banknote service system and the printer. Across all three today it is all about cost reduction. Cash, of course, operates as part of an interconnected wider community. If cash is to have a sustainable future, this has to change and to become about value creation.

KBBNS also looked at the cash ecosystem in the context of three connected and overlapping environments – the environment, society and cost.

Where the three overlap lies sustainability, and green consumables, green production and a green banknote product were a consistent theme throughout Equinox and KBBNS's work.

## Where we are today: banknote service system

Faced with falling cash volumes and the aggressive rise in digital payments, the banknote service system business model of commercial banks, cash in transit (CIT) companies, cash management companies etc. is being disrupted.

As cash infrastructure in the form of bank branches and ATMs starts to fall back in some countries, access to withdraw and deposit cash is under severe pressure (eg. Sweden, Netherlands, Belgium etc.), or starting to be challenged. Equally, acceptance of cash is becoming a problem, and some countries are having to resort to legislation to safeguard the right to pay in cash. Which is why the resilience agenda is starting to move centre stage in many countries.

These pressures impact the confidence of the banknote producer community.

## Where we are today: printers

Today's banknote is cheaper, greener and better than ever before. Since 1980 there has been a 45% reduction in process costs and a 40% reduction in the eco footprint of banknotes. At the same time the user experience, the functionality, security and durability of banknotes has increased.

Meanwhile the eco impact of the wider cash cycle has increased, the cost of the cash cycle has increased, and access and acceptance have reduced.

GDP and population growth has increased the demand for cash. Circulation costs have risen to \$500 billion per year while production costs have been falling. In a traditional basic cash cycle, if production costs are '1', circulation costs are 70. In an intermediate economy the ratio is 1:120 and in a place such as the US the figures are 1:200. 87% of the costs of the cash

cycle are paid by commercial banks/CIT/retailers/public. Central banks cover the rest. Which is why the commercial sector is working so hard to reduce costs, leading to those access and acceptance pressures.

The role of the printer has changed to that of being a feature integrator. KBBNS estimates that the value created outside of printing processes, ie. the value in the substrate and security features added to banknotes such as threads, applied foils and specialist taggants, is now over 70% of the total value of a banknote, leaving only 30% with the printer as a converter.

Perhaps it is no surprise that few commercial printers today are solely printers. For components and embedded features, printers are their route to market, which does give them market power. All this emphasises the need for printers to move from being converters to being value creators.

This, combined with uncertainty about the demand for cash, has led to a lack of confidence amongst printers and a downturn in investment, R&D and innovation.

In other industries the response to such pressures has often been to outsource parts of the value chain in order to:

- Reduce costs
- Simplify manufacturing processes
- Source the best technology
- Reduce inventory and work in progress
- Follow market trends.

Examples being NEC, Motorola, CISCO, Marconi and Nortel. Virtually every company that has gone this route had declined. While few banknote printers are doing this, many seemed to be trapped in pursuing price/cost based business models, creating a price sensitive commodity market. Short term price based competition is becoming the norm and the core business of banknote printing can become low/no value business. The result is either acquisition or closure.

This also applies to paper mills that do not produce their own security components.

## An alternative future

### ■ Banknote demand assumption

Perhaps the starting point is to challenge the assumption that banknotes are in decline. KBBNS estimates that 2023-30 banknote demand globally will grow 4% per year in line with GDP and population growth. It is interesting that countries continue to build new state printing works (for example Egypt, France, Spain and the US) and invest heavily in what they have.

### ■ Adding value in print

There is also the opportunity to change value creation behaviour. Equinox saw KBBNS show its new InPrint Diversity specimen note, that demonstrated a



range of traditional and new printed security features shown off to best effect. These include traditional features such as microtext, a see-through register, tactile marks, multi-tonal elements and latent images along with enhancements of proven features such as a digitally engraved portrait, SPARK® Flow DIMENSION and an intaglio printed security thread.

The specimen note versions showed off three versions of SUSI Optics®:

- JAZZ™ Motion and flip and Image flip
- JAZZ™ Image flip
- SUSI Flip™ (this is the version that flips under UV illumination).

**Rethinking cash and the cash ecosystem**

KBBNS is a thought leader in this space and has moved beyond thinking and talk to action. Its Valicash™ and Smill™ digital products are platforms with which it is working with external third parties on projects ranging from financial literacy and financial inclusion to banknote data collection, particularly for decentralised cash issue through routes such as ‘cash in store’, virtual ATMs and cashback delivery. In that context KBBNS challenges all cash stakeholders to rethink how the banknote product can contribute to society beyond its traditional transactional and storage roles. It gave some useful examples to help people consider changes:

- How can banknotes be used to make decentralised cash recycling models work better (Smartsafes, smart tills, point of sale cash handling devices etc.)?
- What could we do to help the hyper optimisation of recycling and logistics with better data and connected banknotes?
- Compliance with digital processes for new services
- Better use of resources, energy, materials and waste management
- Data compliance supervision
- Trust amplification
- The user experience
- Crisis resilience and budgeting
- Lower costs
- Financial inclusion
- Financial literacy.

The argument is that if banknotes are to continue to be relevant, useful and convenient, we need to re-think the value they can add.

**Final word**

KBBNS has clearly articulated the challenge facing cash, the cash industry and printers. While it continues to develop

much more environmentally friendly solutions across design, pre-press and printing, and it is working hard to ensure that print images and techniques maximise the security of banknotes, KBBNS is also looking at the big picture both for the printer but also the banknote product and banknote service system.

Equinox highlighted the critical moment of change that the cash ecosystem faces but also gave strong pointers and options about for a different future, some of which KBBNS has already started to work on.

**■ Innovation Over Four Decades**

**Case study: Innovation at Equinox**

Innovation can be evolutionary or, occasionally, revolutionary. Most is the former. KBBNS presented and explained its pre-press solutions, all of which represent continuous improvement making the processes more environmentally friendly, easier to use and efficient:

- ONE® portrait software
- ONE® security software
- Asecuri software
- CTiP III
- CToP III
- Platecoat

**Production**

In its production development, KBBNS has focused on modules, quality and data across its platforms.

**■ AKTINA - Art, Knowledge, Technology in Action**

AKTINA represents a major innovative step for banknote printing. It offers print works

a modular approach with each process in line, creating highly productive print lines that match the specification of the banknotes. The modular nature will allow the print line to be changed to match any changes to specification.

The first modules developed are the offset litho processes with inspection modules and standardised feeder and delivery modules. The screen module is in Wurzburg and will be ready by the end of the summer. Units for gravure, flexo etc. are planned.

The litho process has been switched from having a horizontal flow to having a vertical flow. There are blanket and transfer cylinders and two over two plate cylinders. The concept combines modularity, robustness and simplicity, Simultan precision, yield and productivity.

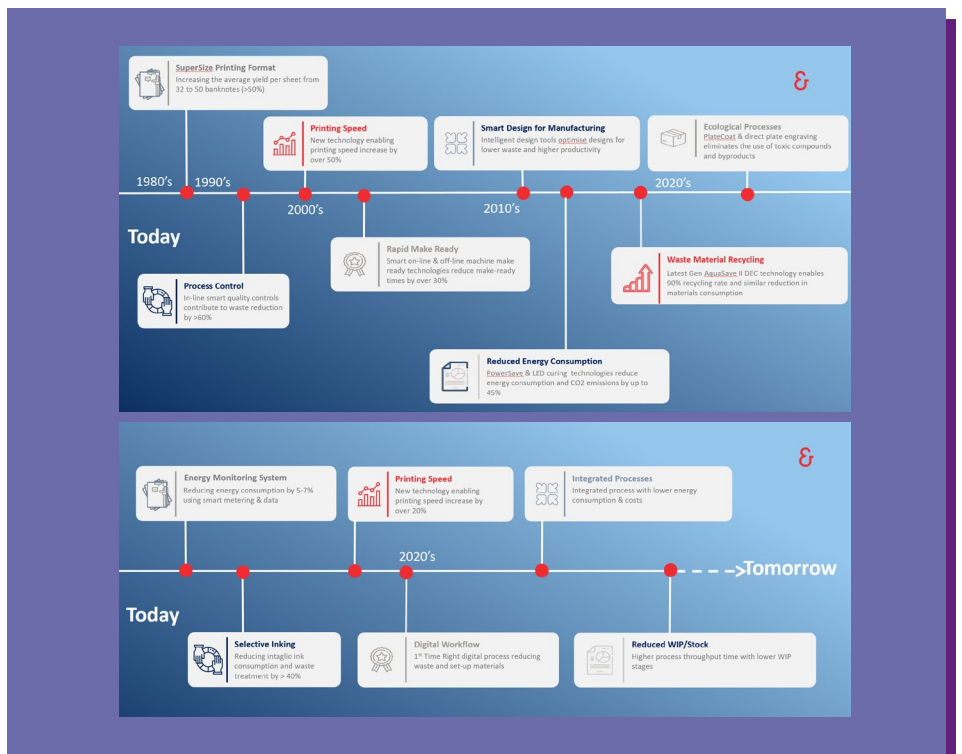
**■ Quality**

An offline check inspection system has been created for non-banknote security documents, but it is suitable for banknote inspection. The technology behind the system is being incorporated into AKTINA. Machine learning is being used to finesse quality checking.

**■ Selective Inking III**

KBA has continued to invest in its selective inking technology. The benefit of the new process is that drying takes less than a day, no colortronics is needed (no more ink keys are required) and less ink is used.

There is engraving reflected plate design, a mirror of the intaglio plate, which inks precisely and allows 3D ink. The process allows simple, consistent, controllable, efficient and green production.



# HSP Latin America Returns to the 'Land of Desert and Glaciers'

The 2024 High Security Printing™ (HSP) Latin America conference took place, for the second time in its 12-year history, in the longest and narrowest country on Earth, filled with starkly contrasting landscapes that stretch from the driest desert in the world to ancient glaciers still waiting to be discovered. That country is Chile.

The exact date of the conference was 3-5 June 2024 and the exact location was Santiago, Chile's capital, an economic powerhouse in the Latin American region.



This year's event turned out to be the biggest yet in terms of delegate numbers, particularly regarding delegates from central banks and government authorities. Central bank attendees hailed from Bolivia, Chile, Nicaragua, Brazil, Argentina, Costa Rica, Guatemala, Honduras, Suriname, Eastern Caribbean, and the European Union, while government delegates included enforcement, customs, revenue, civil registration and immigration authorities from across the region.

Although this year's HSP broke the record in terms of numbers, its aim is not to become so big that it loses its sense of community, which is a key attribute of all three of the HSPs (Asia, EMEA, and Latin America).

## Seminars

The conference opened with three seminars, one of which was led by Antti Heinonen and Guillaume Lepecq of Cash Essentials, on 'The Future of Cash'. Among other topics, the seminar looked at how and why cash is changing, and whether cash is a public good and/or a basic right.

## Main programme

The main conference programme was opened by Sergio Henriquez, President of the Casa de Moneda de Chile (the Chilean

Mint). He was followed by Ricardo Mendez of the Mint, who presented the country's new house note, commemorating the Mint's 281st year of existence (see page 18). Indeed, at the end of the conference, delegates would be treated to a guided tour of the Mint's printing works to see the note being produced.

The programme then split into separate tracks for currency and ID.

The currency track covered regional developments that included Casa da Moeda do Brasil and Blendpaper explaining how they have expanded the lifecycle of cotton banknotes, the Eastern Caribbean Central Bank on its paper-to-polymer experience, PSI Colombia on a holistic approach to designing cash centres and vaults, and the Central Bank of Suriname describing its sustainability initiatives.

Currency developments from outside the region were also covered, with the European Central Bank describing the evolution of the digital counterfeiting landscape and encouraging central banks from the region to take part in the Central Bank Counterfeiting Deterrence Group (CGCDG) anti-counterfeiting systems, and China Banknote Printing and Minting presenting its Year of the Dragon commemorative note.

Sustainability continued to be a theme throughout the conference, with presentations from Giesecke+Devrient, Kurz, CCL Secure and PWPW all describing their work in this area. As did security, with examples of the latest

features for banknotes from IQ Structures, Hueck Folien, SURYS and Louisenthal, along with new design and printing technologies from Orell Füssli, Komori, Jura and Seprinto.



## Fraud and fraud detection

A number of interesting papers focused on different types of fraud and how to detect and protect against it.

They included UnderCurrency (Mexico) on a method to objectively assess optically variable devices, and +LATINA Seguridad Documental (Argentina) on methods to detect security feature emulations on banknotes.

## Exhibition, dinner and football

A specialist exhibition of 40 companies was held alongside the conference sessions, providing delegates with an opportunity to see the latest industry products and solutions up close.

The gala dinner, held at the world-renowned Viña Santa Carolina winery, provided the backdrop for the prestigious HSP awards ceremony for Regional Banknote and Regional ID Document of the Year (see next page).

The conference closed with the annual HSP LatAm football match, sponsored by Hueck Folien. This event has become something of an HSP tradition, adding to that sense of community that defines what this conference is all about.

The next HSP Latin America will take place in June 2025, in Brazil.





# Outstanding Design and Innovation in Latin America and the Caribbean

The prestigious Regional Banknote and ID Document of the Year Awards form part of the industry’s High Security Printing (HSP) Latin America conference. This year’s event was held in Santiago, Chile, with the awards presented at a special ceremony, during the conference dinner on 4 June.

The regional Banknote of the Year Award recognises outstanding achievement in the design, technical sophistication and security of a banknote or banknote series, with emphasis placed on reflecting the cultural heritage of the issuing country in the note, and the relevance of the overall design and symbolism.

Awards were made in three categories for this year’s awards – Best New Banknote, Best New Series and Best New Commemorative Banknote – with Suriname, Peru and the Eastern Caribbean islands all receiving recognition. A special award was also made for the house note that was introduced at the conference by Casa de Moneda de Chile (see page 18).

## ■ Best New Banknote

The Central Bank of Suriname (CBvS) picked up the award for the Best New Banknote for the two new high denomination notes – the 200 and 500 Suriname dollars (SRD) – issued earlier this year.



Exceptional security was a priority for the two notes. In addition, given Suriname’s forestry and agriculture basis, CBvS was attracted to a more environmentally friendly and durable substrate which could at the same time provide state-of-the-art security features.

CBvS had already experienced the durability of composites through the adoption of Hybrid ADDvance® for the SRD 5 and 10 notes. The choice of the Green Banknote from Louisenthal was, therefore, a logical next step. The mix

of organic cotton and certified cellulose are reported to reduce carbon emissions by 63% compared to fibres made from conventionally grown cotton. Additionally, the carrier film for the key security features – RollingStar i+ security thread and varifeye™ ColourChange security patch – comes from a certified recycling circuit with 70% recycled polyester.

The SRD 200 features the Sandbox tree, the fruits of which appear in the Rollingstar® LEAD Pure stripe – visible on both sides of the note through a laser cut transparent window. The back of the note features a Rollingstar i+ thread with Cube design.

The SRD 500 features the Buriti palm, which has a popular fruit with edible seeds. Through the varifeye ColourChange Patch, the fruit changes colour. The back of the note also features a Rollingstar i+ thread with Cube design.

## ■ Best New Series

The winner of the Best New Series was the Banco Central de Reserva del Peru, which recently completed the introduction of a family of new notes with the 200 soles. The first notes in the series – the 10 and 100 soles – were put into circulation in mid-2021, followed a year later by the 20 and 50 soles and concluding with the 200 soles last December.

The new series was designed by De La Rue and is dedicated to Peruvian 20th century figures in the arts, literature, history and science, with indigenous fauna and flora on the reverse. For the first time, the reverse side of the notes have a vertical orientation. The notes also include tactile marks to help the blind identify the denomination.



All notes feature SICPA’s SPARK® Live, De La Rue’s GEMINI™, which splits into two colours under UV light, and rainbow fibres in four colours. The 10, 20 and 100 soles notes feature a 4mm wide RollingStar® security thread from Louisenthal and the 50 and 200 soles notes a RAPID® Detect thread from Crane.

This was the first wholesale redesign of Peru’s currency since 1991 and was a collective effort between suppliers – De la Rue for the design, different printers for the individual denominations, along with the two suppliers of the security threads.

## ■ Best New Commemorative Banknote

This award went to the East Caribbean Central Bank (ECCB) for its commemorative \$2 note, issued to celebrate its 40th anniversary.



Designed and produced by De La Rue in close collaboration on SAFEGUARD® polymer, the front of multi-colour yellow, red, blue, and purple note features legendary cricket star Sir Viv Richards, ‘The Master Blaster’, as well as the 40th anniversary bank logo, turtles, and fish. The back of the vertically designed note combines fish, coral, turtles and a map of the islands in contrasting bright blue.

The banknote’s visual impact is enhanced by features including the first appearance of an aqua-blue tinted holographic foil, turtle imagery, along with the silver of the Argumentum and vibrant colours of the ILLUMINATE™ feature within the note’s window.

The note is legal tender and can be used for transactions throughout the eight member countries of the East Caribbean Currency Union.

With this award, the ECCB has scored a hat trick – having already won the International Bank Note Society (IBNS) Banknote of the Year 2023 award by an overwhelming majority in mid-May and, just two days later, at the Banknote Conference in Fort Worth, Texas, the commemorative banknote category in the IACA Excellence in Currency Awards.



# More House Notes Demonstrate Innovation and Artistry



In last month's Currency News™, we featured Bundesdruckerei's remarkable new Ignis house note as the Banknote of the Month. In this issue, we continue the theme with the presentation of four new house notes – one from Casa de Moneda de Chile (CdM) and three from Polish Security Printing Works (PWPW) – all of which combine innovative design with the latest security features from the respective companies and their partners.

## Innovation Aided by AI

Casa de Moneda de Chile's new 281 house note is the age of the organisation, which was founded in 1743. It is CdM's second house note on polymer and was a joint collaboration with CCL Secure, to demonstrate some of the latest security features possible on GUARDIAN™ substrate.

The theme of the vertically-oriented front is the marine ecosystem and features the seabed, waves and a black dolphin (native to Chile). The horizontally-orientated reverse features the majestic Osorno volcano in southern Chile reflected in the tranquil waters of Lake Llanquihue. Artificial intelligence was used to support the design process, enabling ultra realistic images and dynamic effects.

As well as demonstrating the design capabilities of the CdM, which worked in partnership with CCL Secure, the note also showcases several features specific to GUARDIAN – for the first time – a Vignette -Cameo™ in the window incorporating VIVID Reveal™ which appears as a grey rock and seaweed in normal light, but displays brilliant colours under UV light. Also incorporated in the window are waves, fish and a starfish in colour-shifting G-Switch™.

Other security features include IRLswitch™ (for more fish), gold-to-green SPARK Live™ printed over a secondary window, along with the machine readable features NEOMAG™ and SICPATALK™, and UV fluorescence in the numeral 281 and the bird that soars over the volcano on the reverse.

## Owls, Jaguars and the Deep Blue Sea

PWPW is not just a banknote printer and papermaker. It also develops and produces a number of security inks, coatings and varnishes, some of the newest of which were demonstrated on three house notes presented at the recent Banknote Conference.

First was the Owl Note, also called the Hygienic Note, which was produced to demonstrate PWPW's antiseptic coatings.

One of these is Microb3®, which has anti-bacterial, anti-viral and anti-fungal properties and is applied to the substrate during the manufacturing process. The other is Coat4Note AB®, a post-print varnish with anti-soiling and anti-bacterial properties.

The front of the note is vertically oriented, with the image of an owl against a fairytale forest. The reverse has the same theme, but in a horizontal format, and demonstrates a number of special effects under UV light.

Second was the UNIVERSAL 5 note, developed jointly with KURZ and featuring a captivating image of a jaguar on the front against a backdrop of a forest.

Features include a registered KURZ THREAD with KINEGRAM COLORS® and a diffractive KINEGRAM COLORS® stripe.

The focus of the presentation was on those novel features created by its inks. They include Iris4Note®, a family of iridescent water-based and UV curable screen printing inks, which was used to print an iridescent patch in the shape of a flower. Fluorescent properties can also be added.

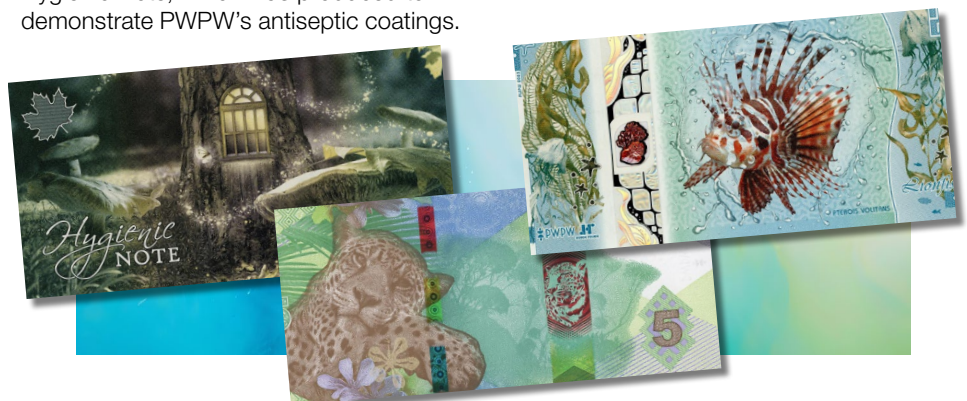
Another is Opal4Note®, a family of colour shifting water-based screen printing inks. Two different variants were combined in one stripe on the reverse for added dynamism.

Both Iris4Note and Opal4Note can also be combined, as they were in the third of the house notes – the Coral note – with an underwater theme of marine life featuring a lionfish surrounded by jellyfish and starfish, moving seaweed, and corals.

The note was developed with Hueck Folien and displays its Safe2® 15mm wide security stripe, applied over a transparent window.

Among the ink features on the Coral note is Mir4Note® – an iridescent ink with an IR element for machine authentication. The note also features MultiUV4Secure – a combination of fluorescent inks and a UV-absorbing layer, enabling the creation of multi-coloured graphic elements.

PWPW stated that its objective is to produce banknotes that are secure, durable and safe. And this trio of house notes all demonstrate two or more of these attributes.



# Note and Coin News

## Milestone on Pathway to New Caribbean Guilder

According to the Centrale Bank van Curaçao en Sint Maarten (CBCS), a significant milestone concerning the new Caribbean guilder has been reached, namely the printing of the first new banknotes.

At the invitation of banknote supplier Crane Currency, executive directors of the CBCS, along with members of the Caribbean guilder project team, visited Crane's facility in Malta where they saw the Cg10 and Cg20 roll off the presses.

During the visit, the CBCS executives also signed off on the approval of the Cg200 proof note, completing the approval of all designs and initiating the production of all notes.

In August, the designs of the banknotes and coins will be presented to the public,



Leila Matroos-Lasten and José Jardim, executive directors of CBCS, examining the details of a printed sheet of new banknotes at Crane Currency's factory in Malta.

and shortly thereafter, the notes and coins will be made available to relevant stakeholders, such as commercial banks.

In the coming months, the focus will be on preparing ATMs, systems and vending machines to ensure the new currency can be introduced seamlessly on 31 March next year.

## In Other News...

■ Banco de Moçambique has launched a new series of banknotes and coins to coincide with the 50th anniversary of the central bank and the 45th anniversary of Mozambique's currency, the metical.



The three lower denominations – the 20, 50 and 100 metical notes – have been produced on GUARDIAN polymer from CCL Secure and the three higher denominations – the 200, 500 and 1,000 meticais – on paper. All incorporate a high-relief portrait of the country's first president, Samora Moises Machel; patterns particular to the Tonga people, which are widely used when weaving artisan baskets; and various flora and fauna characteristic of Mozambique.

The lower denominations include a large transparent window inset with security features including Metalix™ ink and Effect Cameo™. The high denominations feature RAPID® HD Detect threads and SPARK® Flow.

They are the first redesign since 2011 and all were printed by Crane Currency.

The new coins are in seven denominations, down from nine, the 50 and 20 centavos having been dropped. The coins are available in denominations from 1 centavo to 10 meticais.

A more detailed description of the new series of notes and coins will appear in the July issue of Currency News™.

■ The Bank of Thailand will issue 10 million commemorative 100 baht banknotes on 23 July to mark the 72nd birthday of HM King Maha Vajiralongkorn (styled as King Rama X).

The new 100 baht, which will be legal tender, has been printed in a vertical (portrait) rather than horizontal format to distinguish it from Thailand's circulating notes, in common with other commemorative notes issued to celebrate royal milestones. It is produced on polymer, the second Thai note to use the substrate following the issue of a new 200 baht, the most widely used note, on De La Rue's SAFEGUARD® polymer substrate and CCL's GUARDIAN substrate polymers in 2022.



2 million pamphlets for the banknotes have also been printed, which will be available at 10 baht each, with all the proceeds to be presented to the King.

■ The National Bank of Kazakhstan has issued a new 10,000 tenge banknote, the second in its Saka series which began with the introduction of the new 5,000

tenge earlier this year (see CN February 2024). The series pays tribute to the Saka tribes that inhabited Kazakhstan in the first millennium BCE, and which embodies the nation's heritage.



The main motif on the 10,000 tenge, which is predominantly blue in colour with a vertical front and horizontal reverse, is the snow leopard – which lives in the mountains of Kazakhstan and was hunted to near extinction but has now been successfully reintroduced.

Key security features include a varifeye® CC patch, RAPID® Vision micro-optics windowed thread and SPARK Flow Dimension.

■ The Nepalese government has approved a depiction of the country's new map – which includes three border territories disputed by India – on its 100 rupee banknotes. Production of the new notes with the disputed map will start once the Cabinet has approved the new design.



## ... In Other News

■ In commemoration of its 50th anniversary, the Central Bank of the Bahamas has issued a coloured version of its 25 cent circulation coin. The new coin, which maintains the specifications of the existing coin, is not only the first coloured circulation coin to be issued by the Bank, but the first circulating coin ever produced to feature colour on both sides.

On the front of the 24.26mm round nickel-plated steel coin is the Bahamian coat of arms surrounded by the words 'Commonwealth of The Bahamas'. Elements of the coat of arms are printed in blue, white, pink, and green, highlighting

the blue marlin, flamingo, and conch shell. On the reverse is an artist's rendering of a native sloop, coloured in red, white, and brown, in a sea painted blue.



The coins were produced by the Royal Canadian Mint using its pad printing technique.

■ A new set of Guernsey banknotes will be developed for the first time in 30 years. The existing paper notes, first released in the 1990s, still feature the portrait of the late Queen. In a nod to the island's heritage, Guernsey States is employing De La Rue – founded by Guernsey printer Thomas De La Rue in the 1800s – to carry out the work.

The States has said islanders would also get the chance to help in the creation of the new designs, with details set to be released in the coming months. The new notes, once approved, are scheduled to enter circulation by 2027.

### Events

**9–11 SEPTEMBER 2024**  
**SECURITY DESIGNERS FORUM**  
 Warsaw, Poland  
[securitydesignersforum.com](http://securitydesignersforum.com)

**30 SEPTEMBER–3 OCTOBER 2024**  
**GLOBAL CURRENCY FORUM**  
 Muscat, Oman  
[globalcurrencyforum.com](http://globalcurrencyforum.com)

**28–30 OCTOBER 2024**  
**THE COIN CONFERENCE**  
 Lisbon, Portugal  
[thecoinconference.com](http://thecoinconference.com)

**4–5 NOVEMBER 2024**  
**THE AMERICAS CASH CYCLE & PAYMENTS SEMINAR**  
 Louisiana, USA  
[currencyresearch.com](http://currencyresearch.com)

**25–27 NOVEMBER 2024**  
**THE EMEA CASH CYCLE SEMINAR**  
 Cape Town, South Africa  
[currencyresearch.com](http://currencyresearch.com)

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### Contact Us

**Currency Publications Ltd**  
 2.4 The Beacon, Beaufront Park, Anick Road, Hexham, Northumberland, NE46 4TU, UK  
 Tel +44 (0)1932 785 680 Email: [info@currency-news.com](mailto:info@currency-news.com)

