

CURRENCY NEWS™

THE CONFIDENTIAL NEWSLETTER FOR CURRENCY | VOLUME 23 – NO 9 / SEPTEMBER 2025

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Losses Soar in Challenging Year for UK Mint

In her Chief Executive's Report for 2024-25, the Royal Mint's Anne Jessopp reported an after-tax loss of £36.3 million, compared with a loss of £4.3 million in 2023-24, on sales of £1.3 billion (2023-24 – £1.4 billion). In something of an understatement, she noted it had been a challenging year and the result disappointing.

In the last five years, the Royal Mint (TRM) has been diversifying and transforming its business, its objective being to 'forge a new, more sustainable future, ensuring that our 1,100-year-old organisation thrives for generations to come'.



The driver has been the decline in cash usage, while digital payments have increased. The extent of the substitution has varied by continent and country, but the UK has been one of the countries leading this transformation. In 2024-25 payments made in cash in the UK fell below 10% for the first time (from 12% in 2023/24 to 9% in 2024/25).

Last year, TRM announced the withdrawal from the loss-making overseas coin business, stating at the time that UK coinage still remained at its core (see CN April 2024). Ironically, since then, sufficient stocks of UK

circulating coins across the banks and post offices meant that, in a historic first, TRM received no UK coin orders from the UK Treasury. For context, just five years ago, the quantities were 590 million.

As a result, revenues in the Currency segment more than halved to £30 million and it delivered an overall loss before IFRS 9 and exceptional items and allocation of central costs of £9.3 million.

A significant proportion of TRM's overall losses (£31.7 million) related to exceptional costs, including the withdrawal from producing coins and blanks for export (£25.4 million) and the implementation of a right-sizing initiative (£6.1 million).

The result also reflects the tough trading conditions and ever-changing market landscape that TRM continues to operate in, impacted by ever-increasing gold prices, volatile metal leasing rates, and shifts in consumer behaviour.

In the meantime, TRM has continued to pursue an ambitious transformation plan. It launched its Precious Metals Recovery (PMR) plant, which extracts gold from electronic waste and processed more than 1,500 tonnes of e-waste, in August. The focus is now on optimisation of equipment and processes for long term profitability and a more sustainable source of precious metals. Notably it took an 8% equity stake in its PMR partner,

A Celebration of 30 Years of Superior Foils for Banknotes

At the end of July, KURZ Banknote Security celebrated 30 years of security production at the Sulzbach-Rosenberg site in Germany with a two day customer event.

Under the motto 'Tree of Life – Innovation Rooted in 30 Years of Experience', the company welcomed guests with a look back at three decades of high-security manufacturing.

In keynote speeches such as 'A Bird's Eye View – Market Overview and Trends', 'Design Integration in Action', and 'Sustainable Foil Development', internal and external experts demonstrated how market understanding, design, and sustainability go hand in hand at KURZ Banknote Security.

Another highlight was the presentation of the exclusive sample folder 'Tree of Life', containing three special sample notes, which are only available in a small edition (see page 14).

All participants were also treated to a rare tour of selected areas of high-security foil production in Sulzbach-Rosenberg, under the title 'A Walk through the Forest'.

KURZ – or Leonhard Kurz Stiftung and Co KG to give it its full name – is a fifth generation family-owned company established over 120 years ago. From its beginnings as a gold foil producer, it has developed into one of the world's leading manufacturers of hot stamping foils for banknotes. KURZ and its subsidiary OVD Kinegram have successfully created security features for over 300 different banknotes in more than 80 countries, in cooperation with the world's major banknote paper suppliers and printers.

Banque de France and BCEAO Drive Cooperation in the Fight Against Counterfeiting

The Banque de France (BdF), in partnership with the Central Bank of West African States (BCEAO), organised an international seminar on 23–26 September 2025 in Paris dedicated to fighting currency counterfeiting.

Bringing together more than 40 participants from 25 countries and institutions – central banks, judicial authorities, police services, international organisations, and technical experts – the event is part of the 'Banknotes & Cash Cycle Seminars' series, an international program led by BdF to share technical expertise and promote best practices among central banks, particularly their fiduciary departments in charge of currency issuance and banknote production.

The goal, says BdF, is to strengthen inter-institutional cooperation and encourage the sharing of experiences in order to safeguard the integrity of banknotes, at a time when it is crucial to strengthen the position of cash among all means of payment.

Among the highlights were interactive workshops fostering exchanges between central banks on key challenges and best practices across legal, law enforcement, and regulatory areas, supported by the insights of judicial experts and law enforcement agencies who shared their perspectives.

In addition, a new game on the prevention and interception of counterfeit banknotes in circulation was introduced which, enriched by participants' feedback, will be further developed.

According to Érick Lacourrège, BdF's Director General Currency and Retail Payments, 'the fight against counterfeiting cannot be won alone. It requires close

cooperation between banknote printers, judicial authorities, and central banks. This seminar demonstrates Banque de France's ability to put its expertise at the service of an international network of experts.'

Adding to his comments, Mohamed Alfidja, Director of Fiduciary Studies – BCEAO, said: 'monetary counterfeiting is a scourge that knows no borders. By bringing together central banks and key actors in the fight against counterfeiting, and by strengthening technical partnerships with Banque de France, we increase the effectiveness of this fight. Through such exchanges, our member states – and the central banking community at large – gain access to high-level expertise and practical tools to safeguard public confidence in their currencies.'

Building momentum for the future

Further stages of cooperation are already planned, with the shared ambition of establishing common best practices in the fight against counterfeiting.



Keep Calm and Carry Cash, Says ECB

Households should keep some cash at home so they can pay for essentials during crises, according to an analysis of four major disruptive events in Europe, including the pandemic and Russia's invasion of Ukraine in 2022.

Consumer demand for banknotes surged in Europe during each of a string of crises, the research, published by the European Central Bank, showed. Physical currency offers 'distinct psychological and practical utility,' says the study, whose title urges the public to 'keep calm and carry cash.'

The findings support the growing recognition among authorities that cash is 'a critical component of national crisis preparedness.'

For example, authorities in the Netherlands, Austria and Finland recommend that households keep between about €70 and €100 per person at home, or enough to

cover essential needs for around 72 hours. In Sweden, the recommendation is to hold enough cash to pay for things like food, medicines and fuel for at least a week.

The COVID-19 pandemic saw sustained cash hoarding by Europeans driven by prolonged uncertainty. This was followed by Russia's invasion of Ukraine, triggering a spike in demand for cash that was concentrated in countries bordering either Ukraine or Russia.

The two other studied events were the 2014–15 sovereign debt crisis in Greece and the Iberian power blackout this April.

US Currency in Circulation Continues to Grow

The US Federal Reserve has published the print order to the Bureau of Engraving and Printing (BEP) for calendar year (CY) 2026, which is in the range of 3.8-5.1 billion notes, valued at \$108.9-\$139.6 billion. During the year, the Feder Reserve Board and BEP staff may adjust production of each denomination to best match demand throughout the year.

The order is likely to include production of the new \$10, the first in the new Catalyst series of banknotes, which will be introduced one denomination at a time in two yearly intervals and which will include upgraded security features as well as aids for the visually impaired.

The order compares with the projected requirement for 2025 of 6.8 billion notes, which ended up at 4.6 billion notes. The reduction in the 2025 order was attributed to the retooling equipment's offline time requirements for the preparation and testing needed for the new series. In 2024, the BEP produced 5.8 billion notes.

The volume of higher denomination notes (\$10, \$20, \$50, and \$100) is expected to increase by approximately 90% at the midpoint compared to 2025, offset by a decrease in the volume of lower denominations (including the \$2, none of which will be produced).

According to the Fed, the print order reflects the estimate of net demand for currency from domestic and

international customers for CY 2026 and was determined by several factors, including forecasted currency inventory volumes, destruction rates of unfit notes, and trends in net payments.

Additionally, says the Federal Reserve, the print order demonstrates a shared commitment with the BEP to allocate production capacity to essential projects that support the US Currency Program's strategic priorities. These include development testing, completion of banknote series changes (ie. the Catalyst series), installation of new equipment, and work on projects to improve manufacturing efficiency.

Currency in circulation (CIC), a direct measure of demand for Federal Reserve notes, increased by 0.8 billion notes, or \$43.1 billion dollars, between June 2024 and June 2025. The same period the previous year, it increased increased by 0.2 billion notes, or \$7.1 billion dollars. Year over year, CIC continues to increase, says the Fed, though the rate of increase has fallen below pre-pandemic levels.

... Losses Soar in Challenging Year for UK Mint

Excir. Capital expenditure of £12.9 million included investment in this business, which delivered a loss of £5.3 million on sales of £900,000.

The Mint's luxury jewellery line 886, supplied in part by gold recovered from e-waste, continued to gain recognition, albeit the financial results so far have been 'immaterial'.

All ministerial targets for the delivery of UK circulating and commemorative coins were achieved, as was the target for TRM to contribute an average of £4.2 million EVA (Economic Value Added) over the past three years.

The year ahead will be important as the group builds on its new foundations and continues to evolve into new business areas, the TRM said.

In doing so, it will have its work cut out. With cash in the UK in continuous decline and foreign coins out of the frame, and a subdued consumer business (due in part, it says, to collector fatigue), much depends on the yet-to-be-seen success of its PMR business.

It is also hoping for a turnaround in the collectors market (where sales fell by nearly 30% to £97.5 million and profits by two thirds to £8.7 million), and growth in its Precious Metals Investment segment, the only part of the business to grow turnover last year (from £1.15 billion to £1.18 billion), albeit that profit fell back by 22% to £15.7 million.

People in the News

■ **Dr Eyob Tekalign Tolina**, State Minister at Ethiopia's Ministry of Finance, has been named the new Governor of the National Bank of Ethiopia. He replaces **Mamo Mihretu**.

■ The Bank of Mauritius has appointed **Priscilla Muthoora Thakoor** as its first-ever female Governor. She joins from the International Monetary Fund, where she worked as a senior economist in the Middle East and Central Asia department and replaces **Rama Sithanen**, who stepped down following pressure from the country's Prime Minister.

■ Similarly, the Reserve Bank of New Zealand has appointed its first ever female Governor, **Anna Breman**, formerly Deputy Governor of Sveriges Riksbank. She replaces **Christian Hawkesby**, who has carried out the role in a caretaker capacity since **Adrian Orr's** surprise resignation in March.

■ **Álvaro Santos Pereira** – an economist, professor and former member of the Portuguese government – has been appointed to replace **Mário Centeno** as Governor of Bank of Portugal.

■ The International Association of Currency Affairs (IACA) has elected two new Board members – **Kathleen Young** (Chief of Fed Cash Services, Federal Reserve Financial Services) and **Koen Thuis** (Head of Cash Policies & Oversight, Dutch National Bank). They replace Maureen Carroll (Managing Director of the Currency Department, Bank of Canada) and Octavia Gibson (formerly Director, Currency & Payments Oversight at the Central Bank of Barbados).

■ **Dr Cosima von Salis-Soglio** has joined the Management Board of Leonhard Kurz as Executive Senior Vice President, Greater China. She will maintain her current role as current role as Managing Director KURZ China while also contributing to the strategic development of the entire KURZ Group – with a particular focus on Asia.

■ Optical coatings specialist Hueck Folien has appointed **Dr Christoph Steger** as Chief Executive Officer. He has over two decades of leadership experience in global business development and strategic growth initiatives and succeeds **Dr Martin Bergsmann**, who successfully led the Upper Austrian technology company for more than 14 year.

■ Secure Innovation Group (formerly Spinnaker), providers of intelligent cash protection products and remote asset management services, has appointed **Ken Lewins** as Chief Commercial Officer and member of the Board.

Central Banks and Cash Round-Up

The focus for this month's summary of news from central bank annual reports and other sources is Central and South America, specifically Belize, Brazil and Honduras.

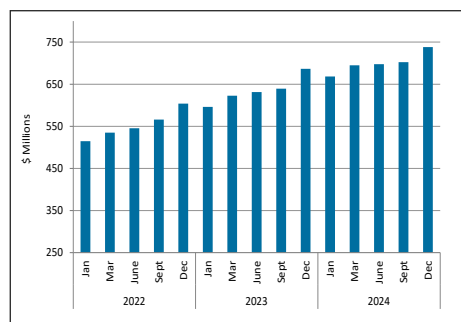
■ Central Bank of Belize (CBB)

Cash in circulation: in 2024 a new series was unveiled, produced by De La Rue, with banknotes of BZD (Belize dollar) in denominations of \$2, 5, 10, 20, 50 and 100. The new notes went into circulation in August.



Currency in circulation rose by 7.5% to BZD 738.1 million in FY 24, driven by similar increases in both banknotes (BZD 691.6 million) and coins (BZD 46.5 million). The most common banknotes were the \$50 (23%) and \$2 (19.8%). Banknotes made up 93.7% of currency, with coins at 6.3%, both unchanged from 2023.

Domestic banks' vault holdings fell to BZD 92.5 million, while currency held by the public grew by BZD 57.9 million to BZD 645.6 million, or 87.5%.



Currency in circulation 2022-2024 (source: Central Bank of Belize).

■ Banco Central do Brasil (BCB)

Cash in circulation: looking back, cash in circulation in 2020 increased by 20.4% due to the COVID pandemic. Surprisingly, since then numbers have kept climbing, albeit not as rapidly. By the end of 2024, cash in circulation amounted to BRL 347.5 billion (approximately US\$64 billion), a significant increase from the BRL \$277 billion at the end of 2020.

Despite the growth in circulation, it would appear that the Brazilian population has decided to hold cash not only as a means of payment, but also, especially with higher denomination notes like the R\$200 banknote, as a store of value. BCB sources say that the R\$200 banknote, introduced in 2020, currently accounts for 2% of the total number of banknotes in circulation and represents 8.8% of the total value in circulation, with the R\$100 and R\$50 notes respectively aligning usage with expectations.

The current banknotes come in denominations of R\$2, 5, 10, 20, 50, 100 and 200, and coins in R\$1 and 1, 5, 20, 25 and 50 centavos.

Production, distribution, destruction: in 2024, 1.5 billion banknotes and almost 1 billion coins were ordered from the Casa da Moeda do Brasil.

The currency is delivered to Banco do Brasil, a state-owned commercial bank, which is responsible for its custody and distribution to the public. Banco do Brasil is also responsible for collecting worn and counterfeit banknotes for destruction and their delivery to the BCB.

Unfit shredded banknotes are sent for cement production. In 2024, around 1,500 tonnes of waste thus avoided landfill disposal and the emission of 1,970 tonnes of CO₂.

Payments: Pix, the popular BCB-approved mobile payment platform, surpassed cash as Brazil's most used payment method with 76.4 % of the population using it. Credit card usage stands at 69.1% and cash at 68.9%.

But the inherent risks associated with digital payment methods are still an incentive for many and fraud in digital transactions has increased. As a result, in November 2024, the BCB implemented a series of plans to continue to combat risks of cyber fraud. (It will be redoubling its efforts following the theft by hackers of funds worth BRL 800 million (\$148 million), held in its accounts. See the September issue of Cash & Payment News™ for the full story).

With respect to digital currencies, the BCB reviewed the pilot of its CBDC Drex, which it is continuing to monitor and test as part of a commitment to continued financial inclusion.

■ Banco Central de Honduras (BCH)

Cash in circulation: the value of cash in circulation at the end of FY 24 was HNL 567.82 billion, an increase compared to the previous year's end-value of HNL 546.28 billion.

Historically, cash in circulation in Honduras had been slightly lower, but at least since 2022, amounts over HNL 500 billion have been the norm and, despite stricter anti-immigration policies in the United States, remittances to Honduras are expected to remain stable.

In 2000, remittances from abroad to Honduras were almost HNL 16 billion. In 2023, this figure had grown to HNL 192.8 billion, almost one-third of total cash in circulation. It is important to note that of those households that receive remittances from abroad, 59% do not have bank accounts and more importantly, 40% of them do not have the capacity to save any of the cash received.

Despite the BCH's push to provide financial access to the public, 93.6% of the number and value of ATM transactions were cash withdrawals (97% of the number of transactions in 2023).

Production: Honduran banknotes have eight denominations – 1, 2, 5, 10, 20, 50, 100 and 500 lempiras, with an 200 lempira commemorative note also in circulation. New 100 and 500 lempira banknotes were issued in March 2024, with improved security elements.

As of December 2024, total of HNL 75.4 billion in banknotes was issued, HNL 4.7 billion higher than in 2023.

Honduras has not minted coins in many years, as they are rarely used, despite being honoured at face value. The coins are nominally in denominations of 1, 2, 5, 10, 20 and 50 centavos, and 1 lempira, and BCH will allow them to be exchanged at their office, but most – due to their metal value – rarely return, being reportedly melted down instead and used for other purposes.

Payments: in common with other central banks around the world, CBH – in accordance with International Monetary Fund (IMF) mandates and technical assistance – created the Central Bank Digital Currency Project in 2023 and submitted its findings to public consultation. As a result, a new document was issued in 2024, entitled 'Digital Payments for All – Pathways to Interoperability and Financial Inclusion'. The conclusion of this document was that CBH should evaluate alternatives for modernising the national payment arena, focusing on improvements to the infrastructure of current payment systems, the implementation of an instant payment system, and CBDCs.

PerceptNote® – Predicting Banknote and Feature Perception

■ By Prof Jane Raymond and Dr Ernesto González Candela

PerceptNote® is the brainchild of two experts working in the area of banknote analysis, Jane Raymond from Secure Perception Research Ltd and Ernesto González Candela from UnderCurrency SA de CV. Each recognised the value of perception analysis for banknote design but also saw the problems and challenges of conducting perception testing with physical samples. In their presentation at the recent Optical & Digital Document Security conference and in this article, they explain their solution.

The public's perception of banknotes is central to banknote security. Indeed, banknotes are only secure when public users can easily authenticate them. Bearing this in mind, central banks and security feature suppliers continuously develop newer, better designs to support public perception.

But how can the industry know if innovations in public-level security features aid public perception?

Traditionally, central banks and some technical development groups have turned to 'perception testing' to gain objective data on the perceptual functionality of new designs and security features. Perception testing involves presenting multiple physical copies of each candidate design (and their counterfeits) to a sample of public users. Their capacity for quick accurate authentication is measured.

Such testing is expensive, time consuming, and presents a significant security risk. Moreover, traditional perception testing requires physical banknotes and counterfeits to be 'manufactured' or, at least, physically mocked-up.

These requirements create a dilemma for those responsible for next generation banknote design. Should decision-makers engage in costly and time-consuming perception testing to gain certainty about public perception of the final product, or should they by-pass perceptual assessment and thereby risk issuing a product that is difficult for the public to perceive?

PerceptNote® Technology solves the problem by applying predictive perception. An alternative method for assessing perceptual functionality is to engage with image analysis, artificial intelligence (AI) and cognitive science to create software that can accurately predict how people will look at and authenticate novel banknotes. This predictive perception approach is the basis of PerceptNote Technology and has already proven useful to central bank decision-makers as they progress design of next generation banknotes.

Using digital images from physical samples, PerceptNote analyses visual

information within a banknote by using sophisticated software tools, and then applies knowledge from known human behaviour to predict perception. No people are involved in testing, making this predictive perception solution fast, flexible, confidential, and cost-effective.

With the idea of creating an inexpensive, faster, yet reliable alternative, experts from Secure Perception Research and UnderCurrency worked together to leverage the latest advances in digital image analysis and artificial intelligence (AI). This, combined with UnderCurrency's engineering wizardry in image capture, led to PerceptNote.

To develop this high-quality technology, the team had numerous obstacles to overcome:

1. To develop a robust method to fully and precisely capture the visual information in new and existing optically variable devices (OVDs) or security features with dynamic effects.
2. To select and apply the best computer vision analysis and artificial intelligence (AI) techniques that would enable predictive perception without jeopardising design confidentiality.
3. To validate the software by directly comparing predictions made by PerceptNote with real human data obtained from actual banknote perception testing.

After years of development, these challenges have been met and now PerceptNote is an accurate, reliable, and well-validated predictive perception tool.

How does PerceptNote work?

Broadly speaking, PerceptNote involves two main steps. The first involves acquiring precise digital image information; the second focuses on analysing that information.

This technology delivers quantification of two key banknote attributes: (1) how dynamic effects perform for each OVD present on the banknote, and (2) how likely users are to engage with each region or security feature within the banknote. This information is delivered in

three forms: (1) visualisation 'maps' of the banknote, (2) summarising indices, and (3) textual interpretations.

The starting point for PerceptNote is a full digital representation of the banknotes, or in some applications, the security features, undergoing analysis. Ideally, these are obtained using UnderCurrency's proprietary Multi-Angle Dynamic Image Scanner (MADIS). MADIS captures images from multiple angles so that a complete, accurate, and high-quality digital representation of all dynamic information on the banknote or sample, including OVD, is obtained. This image capture hardware provides all the data necessary to fully quantify the banknote's dynamic information available to users when they tilt or manipulate a banknote or sample in any axis.

The rich digital representations obtained using MADIS allow PerceptNote to calculate the mathematical entity representing the entire dynamics within the document. This entity is visualised in a 2D 'Dynamic Map' showing the precise location and structure of dynamic image change within each security feature (See Figure 1).

The entity is used, among other purposes, to determine the security feature's 'Dynamic Strength', an objectively-calculated index of the intensity of dynamic image change.

All this information feeds into predictive perception calculations, including quantifying the impact on function and perception of wear and soil on security features. Given that MADIS is operated under standardised lighting conditions, these dynamic measures are suitable for benchmarking banknote or security feature designs and their variants.

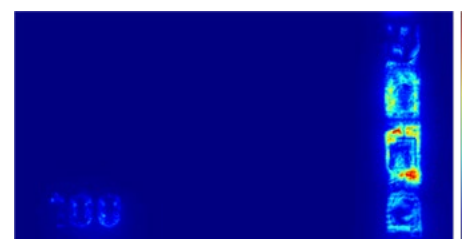


Figure 1: Shows the 2D 'Dynamic Map' depicting the precise location of dynamic image change within banknote when tilted left to right. Colour refers to the magnitude of change each pixel displays. Dark blue indicates no change, while dark red indicates a significant change.

The critical point here is that PerceptNote operates on digital images. Taking full advantage of the flexibility this brings to predictive perception in the banknote context, this tool offers the very exciting capacity to analyse novel 'collaged' banknote designs.

A Snapshot of Three Topics – Data, Quality and Louisenthal

At Giesecke+Devrient's July Currency Technology Symposium it ran nine different workshops and a half day at Papierfabrik Louisenthal (see CN July 2025). Three are covered here. On the following pages, we look more indepth at two other topics covered during the CTS – namely rethinking cash centre operations as a means of building resilience, and cash initiatives around the world.

■ Data Driven Decision Making

Modern manufacturing is data driven. The tools for this are changing as the availability of data changes, bringing with it significant increases in data quantity and complexity, as options for data storage and management change, particularly with the adoption of cloud storage, and with the development and adoption of AI in data management.

Despite that, to manage a cash centre well it is still necessary to understand cash demand and then to be able to manage it. Three main factors that you need to understand and manage are:

- Volumes, by denomination
- Machines availability (their up time)
- People, staffing availability.

Modern cash centres are optimised around maximum automation, standardised processes and transport units, and the intelligent use of software. This session at G+D's Currency Technology Symposium focused on data and the intelligent use of software.

Data and programming

A typical BPS machine has about 5,000 data points generating up to 4 gigabytes of data per day. Today the simplest, most secure and cheapest way to handle and store that amount of data is by using the Cloud. 'Compass Cloud' is now used by many customers across the industry and in a diverse range of countries. G+D uses Microsoft Azure technology, which means customers benefit from high security and availability standards.

Traditional programming is based on human-created rules for problem solving. Simplistically, there is a problem, the human thinks about it and creates some rules which then are programmed creating appropriate algorithms. The programme is tested with training data. This approach struggled when there were too many variables.

Machine learning uses automated rule generation to solve problems.

Analytical tools

A number of tools are available to enable the management of demand, combining all of these trends. These include:

- Compass Banknote Intelligence, which generates easy and fast data insights
- G+D Xpert, with a new AI-driven chatbot enriching a precise and easy knowledge transfer
- Smart Maintenance, a machine monitoring with AI-driven predictive maintenance. Tailored thresholds and alert e-mails prevent machine issues and secure service SLAs
- G+D SerVision, a near real time monitoring customer cloud dashboard of key performance indicators to enable live performance and operation management.

Visualisations such as overviews of service workload, staff planning, the throughput rate per machine and/or site, reject rates and machine 'health' etc. are available and customized alarms can be set, to notify service or operator teams.

■ Understanding Banknote Quality

One workshop was dedicated to considering banknote quality. It looked at how to achieve cleaner notes in circulation, which is important to increase trust in those notes and to increase the efficiency of machine handling.

The first part of this exercise considered the performance of three different substrates that were put through a laboratory based simulation of circulation conditions involving soiling, crumpling and scratching. The trial notes were the same denomination and design. These were:

- A traditional cotton banknote
- A cotton banknote but optimised for durability. In this case a Green Longlife™ note with 100% certified organic cotton, a soil repellent coating based on sugar cane, a renewable raw material, and post-print TOPnote UV varnish
- A Hybrid™ Green banknote with a paper core of 50% certified organic cotton mixed with 50% Forest Stewardship Council certified wood pulp, thin polyester layers top and bottom which are then printed and have a post-print TOPnote UV varnish applied.

Delegates could test their own notes and the results showed just how effective

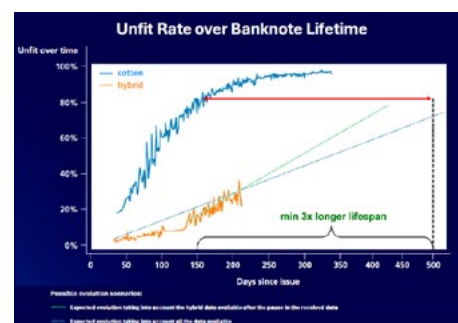
the Green Longlife and Hybrid Green Banknotes were.

The next part of the workshop looked at analysing the performance of the cotton and Hybrid substrates using BPS data and G+D's Compass Banknote Intelligence dashboard. The data came from a real life customer circulation trial. This also demonstrated how machine data can be turned first of all into information and then into insights.

The data sources came from three places:

- A record of the serial numbers per package from the print works
- The issue dates per package from the central bank
- Banknote sorting data from a BPS M7.

The analytics tool with the Compass Banknote Intelligence then generated various reports. 15 million notes were involved in the trial. Of the notes returned to the cash centre during the trial period, 2.78 million were cotton and 0.33 million, 11%, were printed on Hybrid substrate. The trial notes were the same denomination, design and security features. Serial Number Reading (SNR) was used on the BPS machines as part of this assessment so that the true note life could be measured.



A touchscreen simulation tool was used to show the influence and importance of sorting frequency and quality thresholds. Again, data for the three substrates was used.

The model allowed cash cycle conditions to be varied:

- Speed of soiling
- Sorting frequency
- Unfit threshold.

A banknote quality screen showed the distribution of banknote quality, banknote lifetime distribution and the percentage of fit, unfit and unprocessable notes. As you changed the variables, the percentages of fit, unfit and unprocessable notes changed.

It was clear that changing the sorting frequency changed the average unfit level. How often notes are inspected is the key factor. One response could be to change the unfit threshold, but this, of course, has significant cost implications if you raise the standard.

Cash Initiatives Around the World

In the session on cash initiatives around the world, a number of speakers described their cash cycles and access to cash. While the Dutch National Bank (DNB) is insourcing cash processing as cash volumes fall, cash volumes in Canada are now stable and the private sector is investing and innovating. In contrast South Africa is focused on working with stakeholders to manage note quality in circulation. It too, is looking at how to protect cash.

■ South Africa

Pearl Kgalegi from the South African Reserve Bank (SARB) explained how there are 284 high speed sorters in South Africa. All of these need to be aligned with SARB's quality standards.

SARB also has to manage banknote quality across the Common Monetary Area which includes Namibia, Lesotho and Eswatini. Other neighbours also use the Rand extensively. This allows the SARB to plan and forecast for broader reach.

Quality standards are shared with neighbouring countries. Within South Africa, SARB conducts random audits and uses penalties against those not meeting the standards.

South Africa has three big CITs and 11 small ones. SARB meets with Cash Industry participants quarterly to review cash operations.

For SARB, affordability sits alongside the other A's which apply to cash. Affordability also includes the time and effort required to acquire cash, and possible fees charged for cash withdrawals and deposits. For SARB, while cash is King, it also needs protection.

■ The Netherlands

Bas Vink, from the Dutch National Bank (DNB) explained changes in the Dutch cash cycle.

DNB cash operations. DNB has opened a new cash centre and closed its cash sorting operations in Amsterdam. The new cash centre was designed to accommodate future changes in the cash cycle, which was a wise move given that it is now processing safe bags from the commercial sector.

As part of DNB's work to maintain the continuity of the cash cycle, and in the context of planning the new Dutch Cash Payments Act, see below, it decided to offer to process cash returned from safes, including Smartsafes, teller cash receivers, ATMs etc. Adjustments in the new cash centre and its sorting machines (four multi denomination sorting machines) were needed for this. Geldmaat, the Netherlands' utility ATM provider, decided to make use of this service and will now close its own cash centres.

The result is that the DNB's banknote processing volume have already increased and are expected to grow over time to be three times what they were before. One could argue that this is an example of

moving from outsourced operations to a return to insourced operations.

Access to cash. The Cash Payments Act is being drafted and is expected to become law by 1 July 2026. In this Act, infrastructure, deposit and withdrawal and fee are formulated including some continuity obligations for CIT's who have a significant market share. This Cash Payments Acts has been initiated by DNB.

Cash acceptance is not part of the Cash Payments Act, however, but EU regulation is being proposed to ensure cash is universally accepted. At the same time, an amendment to Dutch civil law passed in parliament requiring mandatory acceptance. DNB did not initiate this; politicians introduced this amendment. Exemptions to mandatory acceptance will be put out for public consultation in the third quarter of 2025.

Concerning resilience against unexpected disruptions, the Dutch government recommends that citizens hold cash at home against emergencies, a minimum of €70 for adults and €30 for children, and that these should be held as small denomination notes. This should be sufficient for minimal needs for 3 days.

Resilience needs to be seen in broader perspective and so the DNB is also concerned about the continuity of payments overall. The new geopolitical situation makes resilience in payments a very high priority. Cash, a digital euro, offline payments and more resilient electronic payments all need to be addressed.

Maintaining access to cash

A number of 'conversations' touched on maintaining access to cash. While Nigeria highlighted the impact and importance of policy, Switzerland offered an example of collecting data to inform policy. Finally, Prof Dr Brandl highlighted the need for access to government money, whether cash and/or digital, to mitigate against the inequalities that come with digital only payments.

■ Switzerland

Access to cash is important and good data is key to ensuring access is maintained.

Dr Tobias Truetsch, University of St. Gallen, spoke about his work looking at Swiss travel distances and times to the nearest ATM, bank branch and post branch whether travelling by car or public transport. Working with the Swiss Nationalbank to collect data, he has created a map, www.moneymap.ch, that monitors cash access points

providing a spatial analysis of ATMs, bank branches and post branches along with an interactive dashboard.

By public transport, the average time to reach an ATM and/or post office branch in Switzerland in 2024 was nine minutes and a bank branch 11 minutes. On the other hand, 45% of Swiss municipalities do not have an ATM, 58% a bank branch and 32% a post office branch.

■ Cash and Society

Prof Barbara Brandl, Prof. of Sociology with a Focus on Organization and Economics, Goethe University Frankfurt am Main, spoke about the impact of the cashless revolution on different segments of society.

A move to the digitalisation of money affects lower income groups in a negative way compared with high income groups.

While cash is a public infrastructure with the majority of the costs for its production and distribution being borne by nation states, all digital payments are processed via the infrastructure of private companies, such as banks, credit card companies and Big Tech firms.

High income groups enjoy the convenience of cashless payment methods and the access to easy credit, while lower income groups do not. These companies need to generate revenue and profit from this. They do this by:

- The coupling of payment and consumer credit for which high interest rates are charged and rigid repayment options required
- Extraction of data in the payment process. The basic level is using financial history, and the second is the extraction of payment behaviour, for commercial ends
- The impact of the redistribution of money through loyalty programmes and other benefits of issue the 'right' cash. The Federal Reserve estimates \$15 billion transferred from poor to rich.

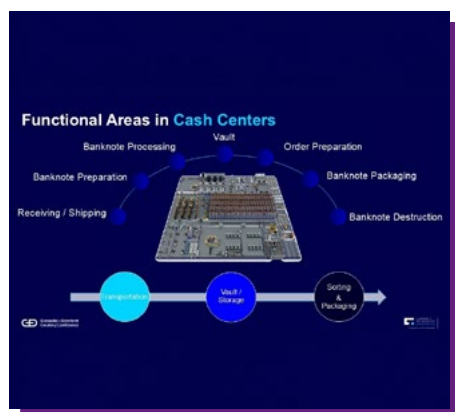
Data from the German 2025 Weizenbaum Report shows that paying behaviour varies significantly between those earning less than €2k per month and those earning more than €5k per month. For example those earning less than €2k use Apple Pay, and equivalents, for 13% of payments and Debit cards for 72%. Those earning over €5k use Apple Pay 34% and debit cards 92% of the time.

Prof Dr Brandl conclusion was that maintaining a public infrastructure for transferring value such as cash or a functional equivalent in the digital realm is important for an equitable society, and that a digital state solution is needed to give access to all in the face of increasing digital payments.

Building Resilience Through Efficiency: Rethinking Cash Centre Operations

A CTS discussion centered on how efficiency can be leveraged to build resilience across a wide range of scenarios through rethinking cash centre operations.

Managing the steady state is relatively straight forward with its predictable workflow, regular cash processing volumes within expected parameters, reliable supply chains, sufficient staff etc. Crisis are rather different.



G+D suggest building a resilient, flexible system on three pillars – standardisation, scalable automation and software orchestration.

Standardisation

Without standardisation, automation is extremely hard.

■ Unified transport boxes

Within a cash centre unified transport boxes have standardised dimensions for all cash movements, regardless of denomination or volume for banknotes as well as coins. It brings scale and cost reductions.

■ Automation

In cash centres, manual steps were replaced by automated ones. This reduced the steps between machine processing and the pick and pack of notes for onward distribution, the steps can be reduced from six steps to three (tray filling, storage and 'pick and pack').

■ Barcode labelling

Barcode labelling allows easy tracking of all of those standardised transport boxes at every step of the process.

Automated handling of loose notes allows up to eight times fewer operator interactions for the removal of rejected notes, 30% less effort in cassette filling and 145km less banderol paper per machine per year. Uniform processes will reduce wait times and errors and lead to more consistent performance.

If the transport boxes could be standardised across all cash centres, including commercial bank and cash in transit (CIT) companies, major efficiency savings would be possible.

Scalable automation

G+D defined three stages of automation. The basic model is that automation 'thinks' but humans do. The advanced model is where humans support while automation thinks and executed. What is described as full automation is where no human interaction is required.

Cash centres comprise three elements:

- Transportation – goods inwards/ outwards, banknote preparation and processing
- Vault storage
- Sorting and packaging – order preparation, banknote packaging, banknote destruction.

The benefits of automation should be less dependence on labour (and no overtime), increased throughput, capacity and transparency on what is where and in what state in real time and with key performance indicators visible, and lower error rates in sorting and packaging.

The basic infrastructure of conveyors and automated guided vehicles (AGVs) are now well known. When everything is synchronised perfectly, then the system should be scalable, stable, predictable and resilient.

The vault configuration depends on an assessment of how much short term storage is needed to provide fast access for daily demands – what is the required size of the buffer stock to handle volatile fluctuations – and how much long term storage is needed.

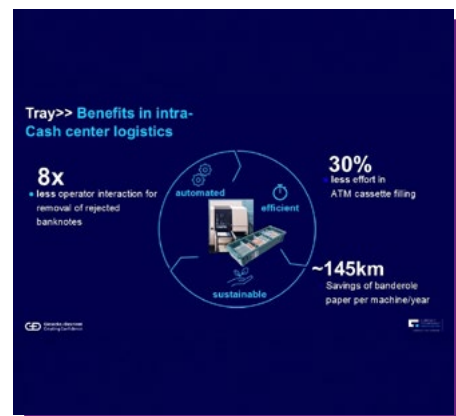
The final part, the sorting and packaging, needs to be fast, accurate and secure.

Software orchestration

What brings it all together is the software that coordinates and optimises the various systems. In addition to a core banking system, the business process layer, there will be three other layers within the cash centre:

- A system layer which manages AGVs, conveyors, robots, stacker cranes, gentry robots, shuttle storage etc.

- An intra logistics control layer for material handling control
- An operations layer for cash centre management.
- All of these form one synchronised system.



Implementation

While changing processes, reconfiguring flows and investing in new equipment and transport boxes can seem daunting, this is a well-trodden path of process analysis, process, material flow and area optimisation. There is no point institutionalising what you do now, the best results come from rethinking and optimising the processes for a better future state.

The three elements of changing are:

The implementation of modular process with standardised interfaces, plug and play stations and easy configuration

Defined transfer points between processes, still with consistent formats and error proof exchanges, so that handovers are synchronised

A layout logic designed for scalability. This is achieved by expansion ready design, flexible configurations and allow space for future expansion.

Benefits in a crisis

A well designed system will have anticipated what may happen in a crisis such as very high levels of demand at short notice, unexpected denominational demand, power and access issues etc. The transparency and process control offered by well-designed software architectures will be vital in responding to the unexpected.

In terms of a crisis, interoperable systems and fewer process steps should offer flexibility and scalability to respond, all with fewer inputs needed, but only if a redesigned cash centre has thought through possible scenarios even through to the impossible scenarios. Luckily, there is a great deal of experience and expertise available to help.

Clearly it is possible today to create highly efficient and flexible operational centres.

... A Snapshot of Three Topics

The three key takeaways from this session were:

- Analysis of machine data allows data-driven decisions
- How often you sort a banknote is critical to being able to manage note quality
- Durable cotton banknote substrates offer secure and cost efficient substrate solutions.

G+D has published a white paper, 'Banknote Substrate Data Analysis', which contains more information on this.

■ Louisenthal

Louisenthal produces around 20,000 tonnes of banknote paper annually using state-of-the-art machinery. The company's expertise is evident in every detail: it implements detailed, complex watermarks and integrates security threads with precise accuracy so that each window matches the correct image.

The substrates are enriched with fluorescent security fibers and can incorporate the 'M-Feature', a sophisticated Level 3 security element. Most of the paper is highly refined with state-of-the-art security foils and iridescent screen printing elements. Patches can also been applied with precision to increase the security of the papers. And Louisenthal applies special dirt-repellent coatings or laminates as thin barrier films (for instance Longlife and Hybrid Green Banknote).

Louisenthal manufactures in a high-security environment that meets the highest security requirements: from the dual control principle to separation locks and traceability of each individual sheet of paper by means of single-sheet marking when required.

However, Louisenthal's expertise goes far beyond paper manufacturing. The company manufactures security threads, foil strips and patches itself, which it either

uses in its own production or supplies to other paper mills. Its innovations include state-of-the-art nanotechnology, such as RollingStar® Venus and co-development of the banknote fiber extraction process. This process enables used banknotes and paper waste to be recycled and returned to the cycle to manufacture new, high-quality paper products.



... New Technology to Predict Banknotes and Security Features Perception

By using sophisticated image manipulation algorithms, PerceptNote can piece together different digitised design elements, including security features with all their dynamic information, to create a novel design. Designs elements can be digitally extracted from different banknotes and then seamlessly pieced together to create new variants. These digitally 'collaged' representations can then proceed to the next step of the analyses just like that of any other banknote or sample.

Armed with a digital representation of a novel banknote, PerceptNote's second step is to analyse all the visual information in the banknote that is used by people during a transaction. As many readers know, the eye and brain do not work like a camera. Whereas the camera uniformly records everything in a scene, our visual system is highly selective. Information that is currently useful gets supercharged attention from the brain and information that is confusing or unnecessary is typically completely ignored. When predicting banknote perception, it is critical to accurately predict which aspects of the banknote are likely to be selected for engagement.

PerceptNote does this by mimicking the working of the human brain and, as a result, it accurately predicts the specific design elements that attract and repel attention.

Having analysed a banknote or security feature from this human perspective,

PerceptNote delivers an easily interpreted 'Attention Map' that highlights the areas on a banknote that public users are most likely to engage with during a transaction. (See Figure 2).

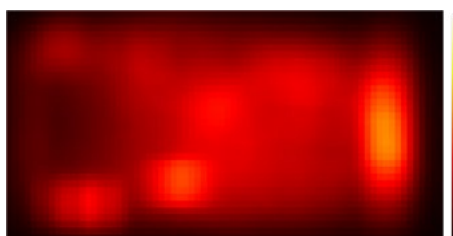


Figure 2: Displays the attention map of the same banknote as in Figure 1, indicating the areas that public users are most likely to engage with during a transaction. Colour refers to the probability of each pixel to attract the attention. Black indicates zero probability, while white indicates a high probability.

High contrast, colour change, movement, depth, or image change are some of the factors that determine these areas of high engagement. However, other 'cognitive' factors also determine attentional attraction; these include meaning-related information such as faces, emotional text, and information useful for denomination. PerceptNote weighs up all these factors when determining the Attention Map.

PerceptNote uses the information contained within the Attention Map to calculate sets of sensitive metrics that index perceptual functionality. An especially useful index is the Perceptual Effectiveness Index (PEI). This measure has proven valuable for comparing and ranking multiple design variants and security

features effectiveness, and for accurately predicting degradation of banknote perception when banknotes are worn.

Importantly, PEI has been found to be highly correlated with accuracy on authentication tasks in perception testing studies involving public users and real banknotes.

In summary, PerceptNote is a sophisticated technological advance that provides a new way to assess public perception of banknotes. Developed by a collaboration of two leading banknote experts, PerceptNote® is an innovative tool that is easy to apply, focused on the needs of designers and central banks, and offers the big advantage of providing objective results when comparing and benchmarking security features and designs variants.

Prof Jane Raymond is founder and CEO of Secure Perception Research and Professor (Emeritus) of Visual Cognition at the School of Psychology, University of Birmingham, UK. She has pioneered many new perceptual analysis techniques for understanding user perception of banknotes and other high value products.

Dr Ernesto González Candela is founder of UnderCurrency, a Mexico-based technical consultancy service comprising a multi-disciplinary team of scientists and other experts and specialising in methodologies and systems for evaluating the security, functionality and durability of banknotes and secure documents.

IOTA Honours Legacy and Leaders

The International Optical Technologies Association (IOTA) revealed the winners of its inaugural Excellence in Optical Technologies Awards – 2025 during a special ceremony held on 16 September at the Optical & Digital Document Security™ (ODDS) conference in Warsaw (see page 11).



Sponsored by IOTA, the awards, which this year evolved from the longstanding Excellence in Holography Awards, now recognise achievements across a broader spectrum of optical security technologies.

Awards were made in seven categories, among them Best Disruptive Technology and Best Integrated Technology / Best Document Security Application. In addition, the Lifetime Achievement Award honoured individuals for their lifelong contributions to the advancement of holography, optical security, and the global fight against counterfeiting.

Best disruptive technology

The winner was China Banknote Printing Technology Research Institute (CBPRTI) for wireless-driven, ultra-thin, flexible OLED anti-counterfeiting components.

The component combines flexible display technology with the wireless communication capabilities of smartphones. It can be integrated into banknotes, passports, or product packaging to create a visible light-emitting security feature. Powered by a smartphone's wireless reverse-charging module, the OLED display lights up when the phone's transmitter antenna aligns with the component's receiving antenna.

According to CBPRTI, what distinguishes this innovation is its unique structural design. The anode and bridging layers are fabricated in a single process using the

same material, which allows for on-screen antennas while reducing resistance and enhancing efficiency. At less than 70 microns thick, the component is both fully flexible and durable, making it compatible with smartphones and wireless chargers, and suitable for integration into, for example, banknotes.



© CBPRTI

Best document security application

There were two winners for the best document security application category.

One was Crane Currency for its Beauty of Life house note, the centrepiece of which is a super-wide MOTION SURFACE® stripe (see page 14).

The other was IN Groupe/SURYS for the Plasmogram™ Reverso stripe that features on the Philippines 500 piso. This advanced security element, developed by SURYS (an IN Groupe company), features a unique triptych of visual effects, offering distinct optical appearances from the front, reverse, and in transmitted light. They include kinetic animations, depth, and colour-shifting features, which are seamlessly embedded into the clear window of the polymer substrate. (include image of note)

Lifetime achievement awards

The Lifetime Achievement Award made its return after four years, and for the first time honoured three recipients – Michael Boehm of Louisenthal, Dr Brian Holmes of

De La Rue, and Elisabeth Schulz, Principal Counterfeit Expert at the Counterfeit Analysis Centre (CAC), European Central Bank.

From 1996 to 2011, Michael Boehm led Louisenthal through a wave of innovation, creating features like Animat®, ColourShift™, RollingStar®, and varifeye® that continue to secure banknotes worldwide. He filed over 100 international patents, pioneered micromirror and holographic technologies, and introduced windows in banknotes to rival polymer. His leadership shaped today's cost-efficient optical elements and inspired a new generation of technologists.

Brian Holmes' career of over three decades has shaped the foundations of security holography, from early credit card and passport holograms to today's advanced optically variable technologies. With more than 80 patent families and 2,000+ holographic originations, he pioneered iconic features such as Spotlight™, PureImage™, Active™, and Kinetic StarChrome™. Renowned for bridging science, design, and engineering, he remains one of the world's foremost leaders in optical security at De La Rue.

Elisabeth Schulz began as a forensic document expert with the German police before joining the ECB in 2000, where she led efforts against holographic counterfeits. She organised the first CAC Symposium in 2003, co-developed a hologram scanner in 2004, and built a comprehensive euro counterfeit hologram database. Her research, has advanced forensic science and left a lasting legacy in hologram analysis.

Recognising innovation and impact

There was a record number of entries for the awards – over 70. Concluding the awards presentation, Dr Mark Deakes, Chairman, IOTA, said: 'I would like to congratulate all the winners and also everyone who applied for these categories. The 2025 awards drew a highly competitive field of global entries, making it especially difficult for the judges to decide. The strength and number of submissions reaffirm the role of optical technologies at the forefront of innovation in authentication, brand protection, and packaging'.



Michael Boehm.



Brian Holmes.



Elisabeth Schulz.

Green Banknote Printing Revolution in China

Reportedly, China's overarching goal for ecological civilization and green development is to build itself into a 'Beautiful China'. Against this backdrop, a green transformation is quietly taking place at Nanchang Banknote Printing Co Ltd (NBPC). A subsidiary of China Banknote Printing and Minting Corporation (CBPM), it is located in the middle reaches of the Yangtze River and is progressively shifting from a traditionally polluting banknote printing facility into a 'national-level green factory'.

Cockpit-style intelligence management

Digital and intelligent management represents the prevailing trend in energy and environmental governance. In NBPC's central control room, real-time energy consumption data across the entire facility is displayed on a massive digital screen.



NBPC's Kinetic Smart Hub.

This operational nerve center, dubbed the 'Kinetic Smart Hub', deploys sensors for real-time collection of foundational energy data on water, electricity, steam, etc. Integrated with remote monitoring functions for air conditioning, centralised gas supply, and substations, it forms an intelligent closed-loop system encompassing data collection, analytical decision-making, and precise regulation in energy management. Leveraging 5G network slicing, machine vision monitoring, online intelligent pollutant sensors, and big data deep mining and analytics, NBPC is able to implement AI anomaly detection algorithms to strengthen system learning and shift pollution control from 'passive response' to 'proactive prediction'. This 'intelligence+eco-friendliness' approach has established an intelligent detection system to achieve precise pollutant management.

Circular wastewater treatment

The intaglio printing process generates nearly 100 tonnes daily of plate-cleaning solution containing high-concentration ink, producing industrial wastewater with high COD (chemical oxygen demand) levels. To counter this, NBPC has implemented advanced ultrafiltration systems serving as industrial water purifiers, thereby achieving over 93% reuse of cleaning solution and annual wastewater reduction equivalent to dozens of Olympic-sized swimming pools. For residual high-concentration ink wastewater, NBPC employs flocculation centrifugation technology to separate

ink sludge and optimise parameters to maintain moisture content below 20%. This transforms waste into low-moisture alternative fuel for downstream cement kilns through co-processing, effectively converting ink residues into green fuel. Post-separation wastewater undergoes biochemical treatment in on-site treatment plants. After meeting the water quality standards, it flows into the reclaimed water system and is stored in the reuse pool before entering the company's water circulation system.

Capitalising on terrain elevation, NBPC constructed 3,600-tonne rainwater collection pools as supplemental water sources for the reuse pool. Combined reuse of reclaimed and rainwater saves approximately 40,000 tonnes of freshwater annually, completing the water recycling loop for NBPC.



NBPC's rainwater reservoir.

Ultra-low emission waste gas treatment system

Printing-related emissions primarily involve two categories: volatile organic compounds (VOC) from ink volatilisation and combustion exhaust from industrial boilers.

VOC treatment posed historical industry challenges. NBPC's zeolite rotor concentration + catalytic oxidation system compresses large-volume low-concentration VOC into compact high-concentration streams, and subsequently decomposes them into water and CO₂ through 300°C catalytic combustion, achieving over 90% VOC removal with low energy consumption.

At the same time, NBPC has implemented low-nitrogen boiler retrofitting. By employing staged combustion technology and flue gas external recirculation technology, the generation of nitrogen oxides is suppressed.



NBPC's VOC treatment facility

Simultaneously, part of the cooled flue gas is extracted from the chimney, mixed with air, and then delivered into the furnace through the burner for combustion. This process lowers both the combustion temperature and oxygen concentration, further reducing the production of nitrogen oxides. Post-retrofitting achieved over 60% reduction in nitrogen oxide emissions at NBPC.

High-efficiency resource recycling

In terms of resource recycling, NBPC analysed the generation and sources of air conditioning condensation heat, compressor waste heat, and solar thermal energy. Using the central air conditioning hot water system as a platform, it designed a waste heat (energy) recovery device to achieve the recycling of these three types of waste heat (energy).

The recovered thermal energy is then applied to the air conditioning and solution preparation processes in banknote printing. This innovation annually saves 378,300 kWh of electricity, conserves 46.49 tonnes of standard coal, and reduces CO₂ emissions by 114.37 tonnes.

To address the massive waste ink barrels generated after the use of banknote printing ink, NBPC introduced plate-cleaning solution into the waste ink barrel cleaning process. It developed and established an ink barrel cleaning streamline, enabling the recycling and reuse of cleaned barrels. This initiative has significantly reduced the volume of solid waste emissions.

This replicable technology now processes 150,000 containers annually across CBPM facilities, creating scaled emission reduction through the 'rebirth' of massive waste ink barrels with automated cleaning streamline.

Outlook

According to CBPM, this green revolution pioneered in Nanchang is providing unique monetised solutions for the for the implementation of the 'Beautiful China' Initiative through multiple replicable technological blueprints.

Moreover, in the global carbon neutrality race, the organisation is demonstrating through practice: even the most traditional industries can script cutting-edge green legacies.

Money Matters: Banknotes Around the World

■ Vertical v Horizontal Banknote Designs

Of the c. 1,000 circulating banknotes in the world from 166 issuing authorities, 35 denominations from eight issuers have a vertical (portrait) orientation on both the front and the reverse, 14 denominations from two issuers on the front only, and 54 denominations from 10 issuers on the reverse only.

Five of the eight currencies with a portrait orientation on both the front and back are polymer, and one is on a composite substrate. Six of the eight are from the Americas (North and South).

Of the two issuers with a vertical orientation on the front only, both are printed on paper.

And of the 10 issuers with a vertical orientation on the back, four are from the Americas, five from Asia (skewed by the inclusion of the three different note issuing

banks in Hong Kong) and one from Europe. All bar one are paper.

So, in total that's 103 denominations from 20 issuers with a portrait orientation on the front, back or both. Half are polymer or composite, and the other half are paper. If one considers that non-paper banknotes make up around 25% of all circulating notes in terms of the number of denominations, then this suggests a much strong bias towards vertical orientation among the non-paper substrates.

In terms of geography, the split is half in North and South America, with the other half split between Asia and Europe. None are from the Middle East or Africa.

With four exceptions, all of the notes have been issued from 2016 onwards, and at an accelerating trend. So, assuming that this is a trend, and it clearly is, then what are the reasons behind it?

Aesthetics and the desire to be different is one reason. Perceived modernity is perhaps another (in other words, it's fashionable).

Another is that it's a way to differentiate between notes of different series. Whilst many issuers opt for an element of continuity between series, utilising the same overall colours and themes but switching the orientation 90 degrees is a surefire way of combining familiarity with novelty. Alternatively, if issuers want to go for something completely different, then new colours and images and new orientations will achieve that too.

Money Matters is a new periodic series from Currency News™, with the information drawn from DataVault, the new industry search engine that can filter and sort banknote (and coin) specifications by multiple fields in a matter of minutes, if not seconds.

There are so many fields to choose from. What would you like to see covered next? Feel free to contact us with your suggestions and/or to try DataVault out for yourself.

www.datavault.reconnaissance.net

Speaker Line-Ups for November Events in Miami and Ghana

The speaker lineups for two upcoming currency events — the Americas Cash Cycle Seminar and the Cedi@60 Anniversary Currency Conference — are taking shape. Currency Research's (CR) annual Americas Cash Cycle Seminar will be in Miami, Florida, 3-6 November, while the Cedi@60 Anniversary Currency Conference, hosted by the Bank of Ghana (BOG) in partnership with CR, will be in Accra, Ghana, 17-20 November.

■ Americas Seminar

More than 30 expert speakers from across the cash ecosystem are slated to join the program of the Americas Cash Cycle Seminar.

An opening address from Beverly Ferrell, Federal Reserve Bank of Atlanta Vice President, will formally kick off the seminar, and she'll be joined throughout the week by speakers from JPMorgan Chase, Deutsche Bank, Federal Reserve Financial Services and the Federal Reserve Board of Governors, Bank of Ghana, Wells Fargo, and many more.

Opening and closing keynote addresses by author Amanda Wick (author of 'The Catalysts: The Accelerating Forces Forging the New World Financial Order') and Citi's Driss Tamsamani will offer perspectives on innovation and resilience, exploring how industry is at a critical inflection point.

■ Cedi@60

Anticipated to welcome more than 600 domestic and international delegates, the Cedi@60 Anniversary Currency Conference is rolling out an equally distinguished lineup of speakers during the event's two days of presentations and panel discussions.

Governor Dr Johnson P Asiamah will formally open the proceedings, First Deputy Governor Dr Zakari Mumuni will deliver a keynote presentation on the e-cedi, and Second Deputy Governor Matilda Asante-Asiedu will draw the curtain on the conference with a closing address.

With many more still to be announced, other confirmed speakers include:

- Dominic Owusu — Head of Currency (BOG)
- Kwame Oppong — Head of FinTech & Innovation (BOG)

- Dr Settor Amediku — Chairman, Cedi@60 Committee (BOG)
- Bernard Otobil — Head of Communication (BOG)
- Dr Philip Abradu-Otoo — Head of Research (BOG)
- Pearl Kgalegi — Head of Currency (South African Reserve Bank)
- Sencia Kaizemi-Rukata — Director of Banking Services (Bank of Namibia)
- Abena Osei-Poku — Managing Director (Ecobank Ghana Limited)
- Clara Arthur — CEO (Ghana Interbank Payment and Settlement Systems Limited (GhIPSS))
- John Awuah — CEO (Ghana Association of Bankers)

With a theme of 'Legacy, Sovereignty & Economic Resilience', the first day of the conference will explore the cedi as a symbol of national identity, the enduring role of physical currency in an evolving economic landscape, macroeconomic and financial stability considerations, and examine the enhanced security features of the modern cedi banknote.

Day two will examine Ghana's 'Digital Transition and the Future of Money', with discussions centering around financial inclusion, the risks and opportunities of stablecoins and other crypto-assets, cross-border payments, and a reflection on the cedi 60 years from now.

www.currencyresearch.com

ODDS and the Genius of Secure Documents

The 2025 edition of the Optical & Digital Document Security™ (ODDS) Conference opened in Warsaw, Poland, from 15–17 September with the headline ‘Welcome to the Genius of Secure Documents’.

The conference, organised by Reconnaissance International (co-publisher of Currency News™) was formally opened by Francis Tuffy, the newly appointed Chairman of ODDS, setting the tone for three days of technical exchange and innovation of experts, innovators and leaders in the optical security landscape.



This year's gathering brought over 160 delegates from 92 companies across 27 countries, reaffirming ODDS as the world's foremost (some would argue only) technical forum for physical, digital, and virtual document security and serving as a meeting place for sharing research, cross-industry knowledge, and best practice.

The agenda featured eight themed sessions, curated by an international technical committee of renowned experts, with topics ranging from cutting-edge optical security features, advances in holography and OVDs, material innovations in anticounterfeiting to evaluation and standards in optical security, digital innovation, and hybrid solutions, reflecting the sector's shifting priorities as threats evolve with artificial intelligence and quantum computing.

As is typical for ODDS conferences, the Warsaw programme opened with in-depth seminars that framed the debates to come. The first session, led by Europol, examined the new threats from counterfeiting, tracing how organised criminal groups exploit weaknesses in document design and distribution. It highlighted the growing links between traditional counterfeiting and cyber-enabled fraud, and the increasingly internationalised enforcement response.

From enforcement to technology, IOTA Chairman Dr Mark Deakes led a seminar on what next for optically variable features, looking at the previous and next generations of holograms, micro-optics, and colour-shifting technologies. He emphasised that while optical effects remain powerful tools for first-line authentication, their survival depends on integration with digital verification.

The ODDS 2025 conference began with a reminder of why secure documents

matter. The keynote address described banknotes, passports and identity cards as ‘genius’ — because they combine science, design, and digital architecture into a single artefact that protects identity, enables commerce and safeguards trust.

And despite living in a digital age, Warsaw confirmed that optical and material science remain the bedrock of document security, with diffractive structures, nanophotonic devices, colour-shifting materials, and deep-subwavelength optically variable devices (OVDs) presented as core elements of secure documents of the future.

One of the most striking presentations came from Mengli Liu (Zhongchao Special Security Technology), who unveiled 3D light-field imaging based on microlens arrays. These features create photorealistic floating visuals with true parallax, visible to the naked eye.

SURYS / IN Groupe continued the optical theme with their work on zero-order diffractive structures. Already deployed in French passports, these structural colour features promise a stable, replication-resistant foundation that retains the kinetic appeal of diffractive effects.

Materials innovation was also a highlight. China Banknote Printing Technology Research Institute (CBPM) presented two breakthroughs: a paper-plastic composite substrate that enables translucent, fluorescent windows and flexible OLED-based elements, ultra-thin devices powered wirelessly by smartphones (which won the award for Best Disruptive Technology in the Excellence in Optical Technologies Awards (see page 8).

These developments suggest a future where security windows are not just inert but active — glowing, shifting, and intuitively verifiable.

Other contributions reminded delegates of the diversity of the optical toolkit and integration of optical and digital. They included:

- RollingStar® effects: new family members from Louisenthal – combining micromirror technology and interference layers with colour manipulation inspired by nature.
- Infrared absorbing elements by SICPA – enhancing machine readability.
- Stable colour 3D OVDs by Toppan.
- Design integration from OVD Kinegram.

- Particle-in-a-particle colour change materials from Diametrix, which create novel responses under tilt, shake or external field application.
- JAGUAR – a digital security feature based on copy detection patterns that can be verified by a simple smartphone scan; jointly developed by Orell Füssli and Scantrust.

Another prominent strand of the conference was artificial intelligence. For the currency field, Ernesto González Candela and Jane Raymond presented PerceptNote®, a predictive tool that models how human users perceive and authenticate banknotes. By combining neuroscience with advanced image capture, PerceptNote allows designers to evaluate security features digitally — without the cost and delay of human trials (see page 5).

A panel discussion – ‘Should Optical Security Devices be More Digital Friendly?’ – discussed whether the pursuit of digital compatibility risks diluting what makes optical security effective in the first place. Chaired by Francis Tuffy, the panel debated whether optical features should prioritise compatibility with digital tools or focus on their unique strengths of visual impact, durability, and resistance to simulation.

The conclusion, such as it was, came down in favour of optical features focusing on their own strengths, as should digital features, rather than trying to be something they are not.

What next

ODDS carries a distinguished history. From its roots in the van Renesse Optical Security & Counterfeit Deterrence Techniques meetings of the 1990s, through the Optical Document Security conferences of the 2000s, the event evolved into ODDS in 2022 to reflect the interplay of optical and digital.

ODDS 2025 marked the fourth ODDS under this format — and the first fully under the leadership of Francis Tuffy, who took over as Programme Director. It proved once again that this is the birthplace of innovations that become global standards.

As the security industry adapts to rapid digital transformation, ODDS 2025 sent a bold signal: optical technologies and material science are neither retreating nor are relics of the past, but essential foundations for trust, visibility, and verification in today's ‘phygital’ era.

The next ODDS will be held in Berlin in early 2027, reverting to the more traditional time in the calendar of Optical Document Security, its predecessor that took place biennially in January in San Francisco. (Some of the presentations at ODDS will be covered in greater detail in subsequent issues of Currency News™).

Jura Looks to the Future of Secure Printing

Set against the backdrop of the Thermal Spa Island in the heart of Budapest, Jura's third industry gathering brought together innovators, designers, and technologists from across the globe for two days of knowledge-sharing, collaboration and celebration.

The event – which has become a highlight in banknote and passport design, printing, and document security – was marked by a mix of creative energy, technical innovation, and reflection on the future of the industry.

Guests were greeted with samples of the second edition of the Puskás commemorative banknote, developed in collaboration with Hungarian Banknote Printing Company.



Adding to the spirit of creativity and fun, attendees also enjoyed complimentary tabletop football games, sparking friendly competition between sessions.

Setting the stage

The opening session set a lively tone. A witty, newscast-style video featuring members of the Jura team drew laughter and applause before Barna Barabás officially welcomed participants.

Encouraging a workshop-style format over static presentations, Barna emphasised Jura's commitment to open dialogue and feedback, making it clear that the event was designed as much for attendees as it was by them.

Highlights of the first day included:

■ **The Puskás Banknote v2** – David Lopez (Jura) and László Balikó (Hungarian Banknote Company) revealed how artificial intelligence was used to reconstruct

vintage portraits of football legend Ferenc Puskás, ensuring design fidelity. On the reverse side, imagery celebrates both male and female footballers, reflecting the growing visibility of women's football worldwide.

■ **Design Philosophy and Functionality** – Beatrix Andrasko from Jura explored the Japanese concepts of Ikigai of Enso, presenting a new collaborative passport project with Komori. She highlighted how security features can be both inspiring in design and functional in protecting documents.

■ **Unlocking Creativity** – Chief Creative Officer Matt Sugdon from Toppan Security spoke on the importance of communication in collaborative projects and praised the evolution of Jura's Corvina software in streamlining workflows and enabling reinvention.

■ **Travel Document Innovation** – Will Byrne from AG2 Ireland presented a compelling case for starting projects with a clear destination in mind, showcasing how Corvina supports iteration and precision at every stage of design.

AI, security, and the future of personalisation

Several presentations looked into the evolving role of artificial intelligence. While AI is increasingly vital in document design, automating repetitive tasks and enhancing workflows, speakers including Zoltán Sándor and László Kollár stressed that AI must be seen as an enabler, not a replacement, for human creativity and intuition.

Discussions also explored personalisation in secure documents, moving beyond user data to embedding unique identifiers directly into design spaces – potentially revolutionising how governments and institutions approach document authenticity.

An evening with a Jura twist

The first day concluded with a scenic ride on the Children's Railway, a unique train line operated primarily by young people. Guests arrived at the dinner to find Jura whisky – imported from Scotland's Isle of Jura – flowing alongside inventive print-themed cocktails like Blur and Face Distortion.

During the gala dinner Jura showed appreciation for those who have worked and collaborated with them for the longest period of time by giving out the Jura Ambassador Award. This year it went to:

- Hungarian Banknote Printing Works – as company
- Stefan Bader, Bundesdruckerei – as an individual
- Keith Gow, former Canadian Banknote Company – as an individual

Day two: precision, digital, and harmony

The second day shifted focus to production, measurability, and digital transformation:

■ **Banknote Authentication** – Jura's Barna Barabás presented three different Jura-developed features for authenticating banknotes.

■ **Security Features You Can Measure** – Dr Leonardo Nikolosi (Parvis) addressed the importance of measurable features and how new technologies, from on-press inspection to downstream cash machine verification, are reshaping industry standards.

■ **Digital Integration** – Jura presented its vision for layered digital technologies in banknotes and passports, framing digital as a reinforcement, not a replacement, of physical documents. Furthermore, Tadej Turk and Kamilla Smid presented Jura digital security features and the respective workflow, invented by Jura digital security department.

■ **Harmony in Technology** – Komori representative Takeo Uehara spoke on the Japanese principle of 'Wa' (harmony), presenting innovations such as modular numbering and varnishing machines that integrate tactile and digital security in seamless workflows.

Looking ahead

From AI-driven design to the fusion of digital and physical security, the Budapest event underscored one thing above all: the future of secure printing will be shaped not only by technology, but also by collaboration, creativity and human insight.

As the event closed, Jura announced plans to transition the gathering to a biennial format, giving the industry time to reflect and return with even greater advancements.



Turning Cash into Community Support

The International Day of Charity, which occurs annually on 5 September, recognises the role of charity in helping others.

Cash has been inextricably linked to giving for centuries, and today digital donations are rising in prominence, but there are less obvious ways in which banknotes and coins have benefitted charities.

Here, we provide some recent examples of the role of banknotes and coins in philanthropy through auctions, donations and other forms of fundraising.

■ Coins

■ **Australia:** to mark the 2020 International Day of Charity, the Royal Australian Mint launched the Donation Dollar – the world's first legal tender currency designed to be donated, not spent. According to the Royal Australian Mint, if every Australian donates just one Donation Dollar each month, an additional \$300 million will be raised for charity each year, and \$9 billion over the coin's lifetime. To date, it has already influenced an incremental \$58 million in additional donations.

■ **United Kingdom:** the Royal Mint produced a commemorative 50p coin to mark the National Health Service (NHS)'s 75th anniversary in 2023, with 100% of net proceeds from sales donated to NHS Charities Together. It also produced a 50p coin in 2024 to mark the 200th anniversary of the Royal National Lifeboat Institution (RNLI), donating a percentage of the price of each coin sold to support the RNLI's work.

■ **South Africa:** the Nelson Mandela Centenary range of 2018 included a bronze coin, with a R27 donation per coin made to the Nelson Mandela Foundation.

■ **Canada:** all net proceeds from Pysanka (Ukrainian Easter egg) coins produced by the Royal Canadian Mint and released in 2022 and 2023 – in addition to those from 2022 Summit Series collectibles – were donated to the Red Cross Ukraine Humanitarian Crisis Appeal and the Ukrainian Humanitarian Appeal. These programmes raised over C\$1 million for humanitarian efforts.

■ **Netherlands:** the Royal Dutch Mint has released several coincards to commemorate Dutch charities. These include the Opkikker Foundation (2020), ALS Foundation (2021), Mentality Foundation (2022), EpilepsieNL (2023), and Hartstichting Foundation (2024). It also designed an exclusive coin in collaboration with the Smiley Movement in 2021, donating a food box to the

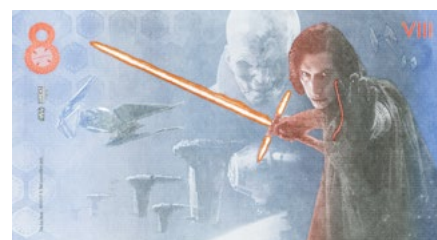
Foodbank Amsterdam at Christmas for every coin sold.

■ **Hong Kong:** the Hong Kong Monetary Authority's mobile Coin Collection Carts allows the public to deposit spare coins into a Community Chest donation box for charity, exchange them for banknotes, or load them onto stored-value facilities like Octopus cards. Since the inception of the programme in 2014, coins worth HK\$1.7 billion have been deposited.

■ Banknotes

In 2015, the Bank of Scotland auctioned a polymer banknote to raise money for the annual charity telethon Children in Need. The £5 note was designed by a 13-year old schoolgirl, and featured Pudsey Bear, the charity mascot. Circulation was limited to just 50 notes and the auction raised just over £55,000.

In 2017, De La Rue took part in a project along with Disney and GREAT Britain to mark the release of the movie 'Star Wars: the Last Jedi', and celebrate 40 years of Star Wars movies being filmed in the UK by producing a special banknote that was sold to raise money for charity.



A limited run of 1,000 commemorative notes was auctioned on eBay and sold out in 15 minutes, having received 2,500 bids. The campaign raised over more than £186,000 for the children's charity Together for Short Lives, which supports children with life-threatening and life-limiting conditions.

And in 2024, when the Bank of England issued the new King Charles III banknotes, it auctioned off the earliest issue numbers, raising over £900,000 that was equally shared between 10 charities chosen by Bank staff.

GCF 2026 – Managing Cash in the 21st Century

The International Currency Association (ICA) has announced the next Global Currency Forum (GCF), taking place 27–30 April 2026 at the Rixos Sungate resort in Antalya, Türkiye.

The GCF is a premier global gathering for the cash industry, bringing together industry leaders, central banks, state print works representatives and academics to exchange ideas, share expertise, and shape the future of cash in a rapidly changing world.

The 2026 theme – 'Managing Cash in the 21st Century – Building Resilience in an Uncertain World' – addresses the critical challenges and opportunities facing the sector today. Across a variety of plenary sessions, panel discussions, and hands-on workshops, participants will explore key topics including:

- National security
- Crisis management and resilience
- Cost control and financial discipline
- Competition and independence
- The future of cash
- Societal significance of cash
- Inclusion and access
- Sustainability
- Freedom and privacy.

As with previous editions in Tarragona, Spain (2022) and Muscat, Oman (2024), the GCF says it prioritises expertise, leadership, and collaboration over promotion. And to expect, as a result, thought-provoking keynotes from global industry leaders, engaging debates that challenge conventional thinking, and workshops unveiling the latest breakthroughs in currency security, design and production – many being revealed for the first time since GCF 2024.

Antalya has been selected not only for its accessibility, including Türkiye's open visa policy and proximity to Istanbul International Airport, but also for its inspiring location. The Rixos Sungate resort offers panoramic views of the Mediterranean Sea and the Taurus Mountains, creating the perfect backdrop for innovation, collaboration, and networking.

Registration and agenda details will be available soon at www.globalcurrencyforum.org.

(House) Banknotes of the Month – Part 2

In the August issue of Currency News we celebrated a number of houses notes – from Bundesdruckerei, PWPW, China Banknote Printing and Minting, and Casa da Moeda do Brasil – showcasing some of the best design and technology in today's banknote features and print.

This month we turn our attention to two further groundbreaking house notes, each with 'life' as the theme. One is the 'Beauty of Life' house notes from Crane Currency, which were joint winners in the recent IOTA award's security category (see page 8). The other is KURZ's series of 'Tree of Life' notes.

■ Beauty of Life

A cross-functional Crane Currency team of banknote and micro-optic feature designers closely collaborated in the creation of the Beauty of Life house note, supported by industry partners CCL Secure, GSI Security Inks, JURA and SICPA. The purpose was to demonstrate Crane's micro-optics feature MOTION SURFACE® on both paper and polymer.



One of the versions is printed on Crane's ENDURANCE® high-durability cotton paper and the other on CCL Secure's GUARDIAN™ polymer. This ensures that central banks can evaluate Crane's latest security and design solutions in a relevant context depending on which substrate they use.

At the heart of the Beauty of Life note is a narrative that unfolds visually, showcasing a rich biotope of a wetland, and its flora and fauna. Layers of movement mimic the activity common to vernal pools and the arrival of spring.

The centrepiece of the note's security, and the rationale for its creation, is the most daring use of Crane micro-optics to date. MOTION SURFACE® is presented in a super-wide format to deliver vibrant, synchronised, multi-directional animation. This feature doesn't merely shimmer, says Crane – it performs.

Custom-built software powers the animation designs, the modelling of lens arrays, ultra-microprinted icons, and motion parallax. Each movement, whether a slow drift or a sharp switch, is calculated, simulated and tested.

In addition to the Level 1 MOTION SURFACE feature, the notes include CCL Secure's UV-fluorescent feature VIVID™ (for the polymer version only), GSI's mouve^{INK} (which combines traditional UV colours/inks with a phosphorescent afterglow), and JURA's ICS® (Information Carrier Screen), a high resolution covert feature hidden within the screen print. The inks and varnish were supplied by GSI and SICPA.

For more information, visit <https://www.cranecurrency.com/news-insights/the-beauty-of-life-a-house-note-in-motion/>.

■ Tree of Life

KURZ Banknote Security's production site in Sulzbach-Rosenberg in Germany celebrates its 30th anniversary this year (see page 2), in honour of which the company has produced a series of celebration 'Tree of Life' notes themed around the beauty and strength of nature and the passage of time.

As the company states, just as it has grown from its roots in hot stamping into a wide range of products and industries, so too has the oak at the heart of these new notes. It is an ecosystem that supports countless lives, from the soil it anchors underground to every branch and leaf reaching toward the sky.

First is Celebration Note 'Day', providing a perfect backdrop for a wide KINEGRAM ZERO.ZERO® stripe with impressive effects, golden metallisation, and seamless design integration. The daytime scene shows the old oak drawing water up from the earth to nourish each bough and leaf. On the reverse, a bird swoops in to perch amidst the foliage where, when spring comes again, it will nest, and the tree will cradle a new generation of life.

Then there is the Celebration Note 'Dusk', which features a wide KINEGRAM® HDM stripe (with effects including Golden Mirror, Achromatic Effect, or Deep Spot) and, again, seamless design integration. The tree at dusk is lit by the waning daylight, with shadows lengthening as evening approaches. Among the leaf litter, deer move carefully – alert, yet reassured by the steady, towering presence of the oak, a place they will return to time and again throughout their lives.

Finally, Celebration Note 'Night' showcases a wide KINEGRAM® COSMIC stripe with impressive effects including Colorful Movement, Flux Effect, and Surface Relief. By night, the tree is bathed in moonlight that silvers its knurls and contours, shaped across the aeons of its long life. A fox races past its trunk, seeking opportunity in unsuspecting small mammals or insects asleep in the darkness.

On the reverse side of all three celebration notes is a KINEGRAM® VIVID patch. VIVID combines kinematic movements in all directions with a powerful depth effect, and the version on the Tree of Life notes features matching colours and the numeral 30.

'Through countless day-and-night cycles, the tree endures, standing as a testament to stability and longevity, holding the memories of the many lives that have passed through its roots and branches. The concept reflects our goal of creating banknotes that are beautiful, enduring, and secure', commented KURZ.

More information about the "Tree of Life" celebration notes, can be found at <https://www.kurz-banknotes.com/tree-of-life/en/>.



Note and Coin News

The Bank of Thailand (BOT) has launched new 50 and 100 baht (THB) banknotes on polymer, which will go into circulation in November. The launch builds on the success of the THB 20 note, which was issued in 2022, and which studies by the BOT have shown is four times more durable than its paper counterpart. The projected savings as a result over the eight years that the notes are expected to last are 350 million banknotes per year, reducing production, transport and resource costs.



The new THB 50 and THB 100 notes retain the familiar designs of the current paper versions while incorporating advanced security features.

The substrate for the THB 100, which accounts for one third of all banknotes in circulation, is CCL Secure's GUARDIAN™. It incorporates a complex window, a GSWITCH™ dynamic colour-shifting feature that makes a flower on the note change from purple to orange when tilted, and a secondary window contains a METALIX™ pentagon with a brilliant metallic sheen and a lustrous gold finish.

The substrate for the THB 500, meanwhile, is De La Rue's SAFEGUARD™. It features colour changing, iridescent and hide and reveal security features.

In addition, both notes will include embossed and transparent diagonal lines to support individuals with visual impairments, which can be easily touched and felt.

The new banknotes will be issued on 21 November through all banks and ATMs. Notes of the existing and previous series remain legal tender.

In Other News...

■ Banco de Guatemala put into circulation a new Q100 (quetzal) banknote in July. It is one of the most widely used denominations in the country and features a new dynamic Galaxy® Saturn thread.



The banknote maintains its traditional colour tone and features the iconic portrait of Bishop Francisco Marroquín, and the high-definition watermark combines Marroquín's face with the number '100', in Arabic and Mayan numerals.

The 4mm Galaxy thread is recognised for faster dynamics, definitive colourshift and a noticeable 3D effect. On the Q100, when tilted, the thread changes colour from green to blue and displays cultural symbols such as the Great Jaguar pyramid (with a surface relief effect), the acronym 'BG' (demetallised) and the number '100'. The Galaxy Saturn also provides inherent 3D design dynamics, with the inner circles appearing above the surface and the outer circles appearing below the surface.

■ Brunei Darussalam Central Bank (BDCB) has announced plans to issue the New Family Banknotes Series in five denominations – BND 1, BND 5, BND 10, BND 100, and BND 500 – marking, it says,

a significant milestone in the evolution of the nation's currency.

The new series is scheduled to enter circulation in the first half of 2026 and will be produced on GUARDIAN polymer substrate with upgraded security features.

Details of these features have not been released, but the new notes will incorporate the DOMINO™ feature to assist the visually impaired. DOMINO consists of raised dots found on the lower right corner of each new banknote, with each denomination displaying a unique arrangement to help users easily identify them.

The new notes will also remain recognisable and familiar to the public. In particular, they will feature portraits of HM Sultan Haji Hassanal Bolkiah on the BND 1, BND 5, BND 10, and BND 100, and his father, the late Sultan Haji Omar Ali Saifuddien, on the BND 500.

In addition, the new series will reaffirm Brunei Darussalam's official unit of currency (according to the Currency Order, 2004), namely the 'dollar', which will replace the term ringgit across all denominations. This change aims to strengthen public familiarity and encourage wider adoption of the term.

Brunei was the one of the first countries to transition to polymer for its banknotes, back in 1996. New versions of the BD 1, BD 5 and BD 10 with an updated portrait of the Sultan were issued in 2011. BDCB also issued BD 1,000 and BD 10,000 banknotes in 2006 but these denominations do not appear to be part of the new series.

All existing banknotes in circulation will remain legal tender and will continue to circulate alongside the new series.

■ The Central Bank of Sri Lanka (CBSL) has marked its 75th anniversary with the issue of a 2,000 rupee (Rs) commemorative banknote under the theme 'Stability for Prosperity'.

Designed by De La Rue and printed locally by De La Rue Lanka, the design features the CBSL head office, Colombo's lighthouse clock tower, and the modern city skyline, while the reverse features a stylised map of Sri Lanka, a water lily, and the CBSL's vision statement.



A total of just 50 million notes have been produced, enhancing its commemorative value. Security features include the micro-optic and colour shifting thread IGNITE®, the UV-reactive print feature Enhanced GEMINI™ and tactile bars to support the visually impaired.

■ The Bank of Papua New Guinea, which has recently issued a commemorative 50 kina banknote and 50 toea coin to celebrate the nation's Independence Day, has also unveiled the design for a new

... Note and Coin News

commemorative 100 kina banknote. It will be issued early next year and will celebrate the late Sir Julius Chan, the nation's first Finance Minister, second Prime Minister and architect of the kina currency.



■ The Bank of Botswana has unveiled a 50 pula banknote commemorating its first Olympic gold medallist, sprinter Letsile Tebogo, who won the 200 metres, and the men's 4 x 400 metre relay team that he anchored to a silver medal, at the Paris Olympic Games last year. For the relay, he ran the second fastest relay split in history.

The 50 pula note was announced on the day of the Bank's 50th anniversary celebrations. The front features the Bank's redeveloped headquarters building and the Motswedi diamond, the second largest diamond ever found in the world, unearthed in Botswana's Karowe Diamond Mine. The reverse depicts Letsile Tebogo along with his teammates.

In terms of security features, the current holographic stripe on the front of the existing 50 pula has been replaced with Oberthur's Anima™ micro-lens thread that displays an animated effect of a man running.



Events

3–5 NOVEMBER 2025

THE FUTURE OF CASH

Warsaw, Poland

thefutureofcash.com

3–6 NOVEMBER 2025

**THE AMERICAS CASH
CYCLE SEMINAR**

Miami, Florida

currencyresearch.com

10–13 NOVEMBER 2025

MINT AND PRINT

Istanbul, Turkey

mintandprint.com

1–3 DECEMBER 2025

HIGH SECURITY PRINTING ASIA

Kuala Lumpur, Malaysia

hsp-asia.com

2–4 MARCH 2026

HIGH SECURITY PRINTING EMEA

Rabat, Morocco

hsp-emea.com

Publisher: Currency Publications Ltd (a Reconnaissance/Currency Research company).

Editor: Astrid Mitchell (right).

Editorial Advisors: Richard Haycock, Martyn White.

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Annual subscription rate: from **£1,595** plus postage (also includes the Currency Index database and Currency Publications bi-weekly updates). Ask about subscriptions for multiple access, including to the Currency News e-publishing platform.

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ISSN 2516-6336

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