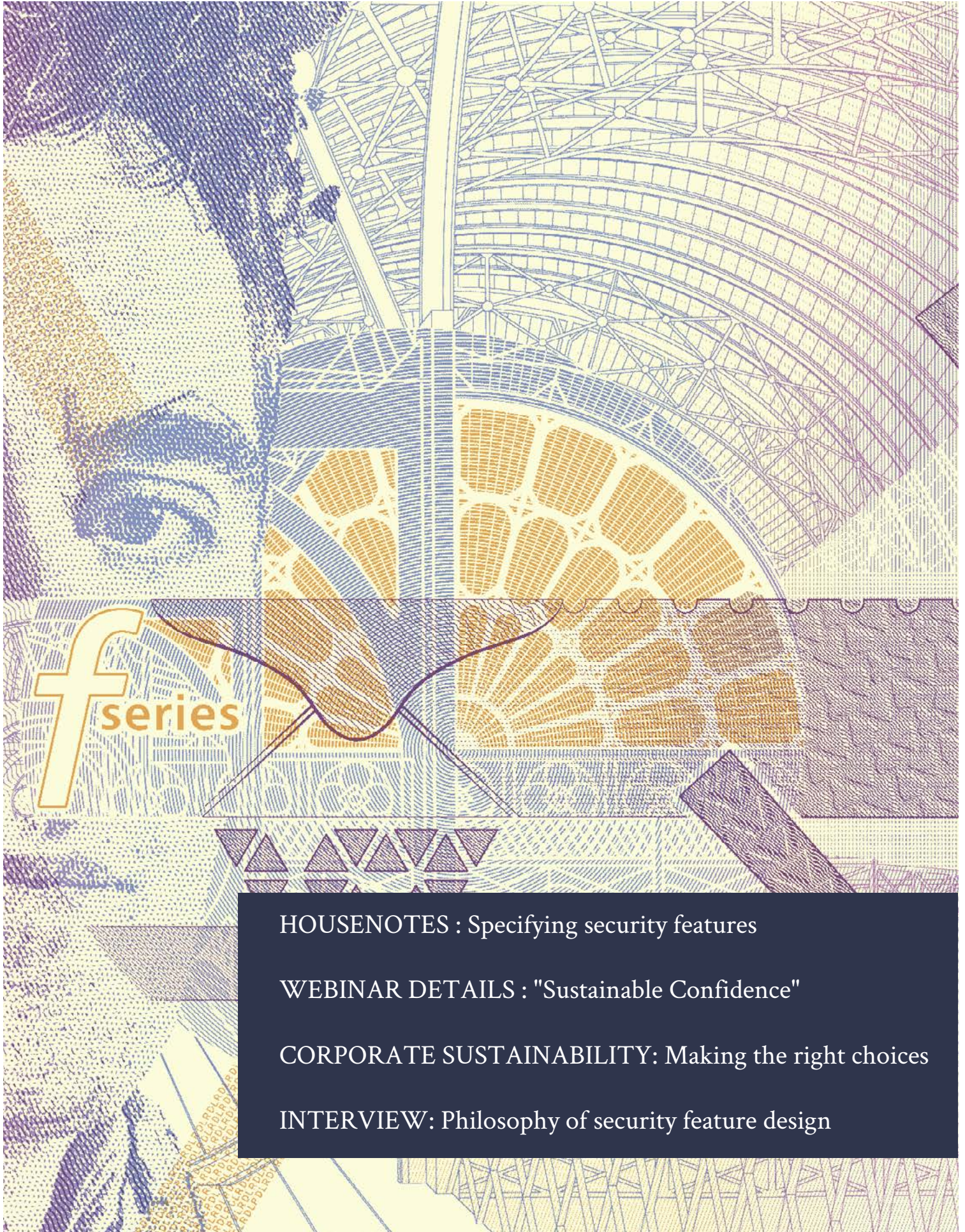




DeLaRue

Going Beyond

October 2020



f series

HOUSENOTES : Specifying security features

WEBINAR DETAILS : "Sustainable Confidence"

CORPORATE SUSTAINABILITY: Making the right choices

INTERVIEW: Philosophy of security feature design

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introduction

The transition to polymer banknotes continues with new banknotes issued in Angola and Uruguay, the new Fiji \$50 commemorative is about to go live and the final Northern Irish polymer £20 from Ulster Bank will be released this month.

We have watched the rate of polymer conversion grow ever since the first SAFEGUARD® polymer banknote was issued in 2013. We are now investing to grow capacity and ensure the future demand can be met. For a while now, banknote issuing authorities have said that they have transitioned to polymer banknotes because it is cleaner, greener, more secure and more durable. We've been exploring that in more depth and have summarized some of the supporting information behind this in this month's edition.

More interestingly, representatives of three central banks have agreed to talk about their reasons for upgrading to polymer during a webinar on the 28th October. Susan Kumar (Chief Manager, Reserve Bank of Fiji), Andrew Baker (Senior Manager, Bank of England) and Timothy Antoine (Governor, Eastern Caribbean Central Bank) have all kindly agreed to be interviewed and to share their perspectives. We are deeply honoured that they will take part in this webinar. The first viewing will be 8am GMT on the 28th October and it will be repeated at 4pm on the same day. We hope all banknote issuing authorities and central banks can join us to learn from the experiences of others.

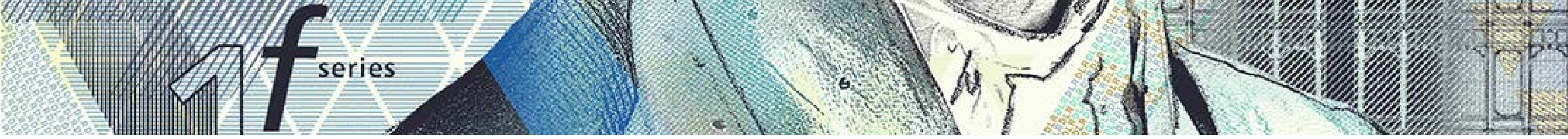
We have also been investing time in our paper security features. In early 2021 we will release six new paper and polymer housenotes that will showcase twenty new variants of security threads, holographic effects, polymer features and our new embedded stripe product type. In this edition of Going Beyond we talk a bit more about creating the new housenotes.

If you'd like any more information about anything in this newsletter or you'd like to register for the webinar please contact us at currency@delarue.com.



A handwritten signature in black ink, appearing to read 'Ruth Euling'.

Ruth Euling, Managing Director



Creating the new Housenote



Mark Spencer, Technical Product Marketing Manager discusses the process behind specifying the features for the new housenote series.

Creating the 1st Edition Feature Series of De La Rue housenotes is a process similar to the creation of any live banknote or series. All projects begin with a clear objective, whether that be to upgrade security; improve durability; reduce cost and environmental impact or implement new features and products, the core skills and deliverables remain constant.

and the aesthetic appeal of the chosen feature. We chose a selection that forms the backbone of our security features, choosing examples from our embedded, applied, print and SAFEGUARD® feature categories.

Our selection of NEXUS™, PUREIMAGE™, KINETIC STARCHROME®, IGNITE®, ARGENTUM, GEMINI™, Holographic stripe on SAFEGUARD® and our SAFEGUARD® polymer substrate can be found on billions of live banknotes today. When choosing effects, the features present in the 1st Edition Feature Series show evolutions of existing features which have not been seen yet. The new housenote was an ideal opportunity for us to showcase the development of these new effects, colours and overall appearance as well as the very wide embedded stripe of NEXUS™.

A critical step when designing any banknote series is selecting the right features. Assessments must be made as to what constitutes the correct integration platform, which technologies complement the requirements of the banknote, the difficulty in counterfeiting chosen features

Many of the new effects, colours and technologies seen in this new series of housenotes are the result of direct feedback from customers, market analysis and technology advancement. New colour schemes and



holographic effects give enhanced brightness to KINETIC STARCHROME®, new effects within PUREIMAGE™ both offer familiar pulsing effects seen in security threads but also a new approach to the traditional view and conventional shape of a security thread. SAFEGUARD® is the substrate for two housenotes. The first sees a novel ink feature, the highly reflective ARGENTUM ink combined with the ILLUMINATE substrate design feature. The second note is a holographic stripe, comprising new vibrant and interactive effects, all modelled within our new holographic security which combines the security benefits of image based classical holography with different and modern effects and animation.

Once the features were selected and the new effects categorised, we moved to set the creative and technical narrative for the series. (The full design story of the new housenote was featured in last month's issue of Going Beyond.) This took place through a series of meetings and workshops with internal stakeholders from Design, Marketing, Sales, R&D and Manufacturing, bringing together the critical expertise needed to identify the approach that would ensure success at the later stages.

This stakeholder engagement is vital for the successful design, manufacture and launch of

any banknote or banknote series. It was only at this point that the designers were able to put pen to paper, creating the functional and technical layouts that would make the framework for the aesthetic design.

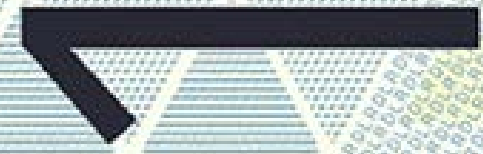
There is no 'off the peg' solution for creating a series of banknotes. Experience, knowledge, creativity and a rigorous attention to detail and the support of the varying technical departments enable every banknote created by De La Rue to be functional, fit for purpose and push boundaries in creativity.

1st Edition Feature Series headlines

- The new housenote series will launch in early 2021.
- The Feature Series will comprise of six notes, two polymer and four paper.
- A brand new feature and category will be launched.
- Twenty new variants of existing features.

PLANNED FEATURES

- NEXUS™
- Enhanced GEMINI™
- PUREIMAGE™ with new effects
- New KINETIC STARCHROME®
- ARGENTUM
- Next generation holographic effects
- Holographic Stripe on SAFEGUARD® with DEPTH, PUREIMAGE™ and KINOFORM



"New & Improved"

The 1st Edition Feature Series housenotes launch in early 2021 and will showcase the latest security features from De La Rue.

The new housenote series will demonstrate De La Rue's latest product range, with six paper and polymer housenotes and over twenty new variants of existing security features. We will showcase new features from our colour shift, holographics and micro-optics technology platforms.

This series will be used to show the choice available to issuing authorities including a new embedded stripe product category and upgrades to existing products. All of the features have been developed to be easy-to-authenticate and difficult to counterfeit or simulate.

PUREIMAGE™ represents De La Rue's next generation of holographic thread. Bespoke ultra-fine grating structures produce effects that are visible when tilted on any angle. The new housenotes contain three new variants of PUREIMAGE™ thread, each with a new effect upon tiling. One effect appears to rotate. Another effect has alternating expanding and contracting shapes. The final effect is designed to appear as

though the actual thread changes shape upon tilting.

PUREIMAGE™ effects have also been incorporated into KINETIC STARCHROME®, upgrading the existing holographic options to be more striking across a wider viewing angle. Furthermore, the red-green colour shift in the existing KINETIC STARCHROME® has been joined with a new blue-green colour shift option. The way that the holographic and colour-shift elements are combined in KINETIC STARCHROME® allows for some of the most bespoke thread designs available. These upgrades provide even more choice whilst retaining the advantage of being doubly hard to counterfeit due to the presence of two highly secure materials.

Other upgrades include the holographic effects in the applied patches and stripes, new IGNITE® effects and the new embedded stripe, NEXUS™. More details will be made available on these over the coming months.

SUSTAINABLE CONFIDENCE

WHY CENTRAL BANKS CONVERT TO POLYMER



DeLaRue



Reconnaissance

WEDNESDAY 28 OCTOBER

08:00 or 16.00 GMT

Guest Speakers



Timothy Antoine
Governor
Eastern Caribbean Central Bank

Timothy J. Antoine is an economist and development practitioner who was born in Grenada. He has served as the third Governor of the Eastern Caribbean Central Bank (ECCB) since 1 February 2016.



Susan Kumar
Chief Manager
Reserve Bank of Fiji

As Chief Manager Susan is a member of the senior management team of the Reserve Bank and directly reports to the Governor and Deputy Governor of the Bank. In this role she is responsible for maintaining an adequate supply of quality banknotes and coins in circulation and ensuring the integrity of the banknotes and coins.



Andrew Baker
Senior Contract Manager
Bank of England

Andrew was appointed as Senior Contract Manager at the Bank of England in 2014. His role covers the commercial and contractual relationship with the Bank's banknote suppliers, Quality Assurance function and the financial aspects of the banknote budget.

WEBINAR
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AFTERNOON SESSION
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Cleaner, greener and cost effective change

By Dr Nikki Strickland, Head of Product Marketing



The transition from paper to polymer banknotes continues to gather pace.

In recent months the Scottish and Northern Irish Banks have issued their polymer £20 banknotes and the Bank of England is working on its new polymer £50. The Central Bank of Egypt has announced its 10 and 20 denominations will move to polymer. The National Bank of Angola is midway through the introduction of its four polymer banknotes and the Central Bank of Trinidad and Tobago have unveiled their updated concept designs. Many other central banks are in discussions or considering upgrading.

Why are so many central banks transitioning to polymer?

Often the reasons cited are that polymer is cleaner, greener, more secure and more durable than their paper counterparts.

The cleanliness comes from the zero porosity of the polymer banknotes, which means that dirt doesn't get trapped in the substrate and the notes look cleaner for longer which increases their time in circulation. During the COVID-19 pandemic this also means that wiping the notes with sanitizer means polymer notes can be treated like every other hard surface (and even though the role of surface transmission is now thought to be much less than airborne particles the wiping-down of surfaces has become commonplace).

The greater cleanliness of polymer notes has the additional advantage of unlocking a broader palette of colours, historically paper banknotes have avoided colours that show the dirt. The result is that banknote issuing authorities can now select brighter, fresher looking colours for their banknotes.

The greenness comes in part from the improved

durability of the polymer banknotes. Banknotes that last longer, need replacing less frequently and consume fewer raw materials. Banknotes that look better in circulation are more likely to be re-issued into circulation more times at the point of local sorting, requiring less transportation overall.

Polymer banknotes are also fully recyclable at the end of their useful life – a benefit of being a pure substrate that is widely recycled. Banknotes return to the central bank for destruction, which means that they have the potential to be recycled. Access to specialised recycling facilities is possible without having to build specialist equipment, with 'clean' recycling options (i.e.. machines that don't release toxic fumes) available.

De La Rue has developed an environmental and carbon footprint assessment tool, working with the leading environmental impact organization ThinkStep to align to an internationally recognised approach. This tool covers global warming potential, non-renewable primary energy demand, abiotic resource depletion potential, acidification potential, eutrophication potential and photochemical ozone creation potential. This tool continually demonstrates the benefits of polymer over paper banknotes, in alignment with other independent studies conducted by central banks such as the Reserve Bank of Australia, Bank of Canada and Bank of England.

De La Rue also offers a carbon neutral banknote service – partnering with Carbon Footprint Ltd to quantify and balance out emissions associated with banknotes across their life cycle, then offsetting that impact. Via this service it supported the Central Bank of Samoa in issuing the world's first ever carbon neutral banknote.

The security benefits can be seen from the reduction in counterfeit rates as banknotes transition to polymer. The Bank of England, Reserve Bank of New Zealand, Mexico and Bank of Canada were some of the central banks

this many central banks experience cost benefits across the lifetime of the banknotes, with the Reserve Bank of Australia recently stating that it has saved over \$1 billion dollars since the transition to polymer.

“Polymer is cleaner, greener, more secure and more durable than paper”

who experienced a drop in counterfeits after transitioning to polymer.

Whilst no banknote is, or ever will be, entirely counterfeit proof, research suggests that techniques to produce a high-quality counterfeit polymer banknote are slow, expensive and require a high level of effort and technical expertise. Digital inkjet and toner print don't adhere to it and the presence of a window is hard to simulate convincingly in paper banknotes. Many aspects of counterfeiting paper banknotes become more complicated for polymer notes or require new techniques and equipment.

That said, De La Rue recognises that the type of local counterfeit threat plays a role in the most appropriate banknote security features and so continues to advance paper-based security features and ensure central banks and banknote issuing authorities have the choice they need.

One of the most obvious benefits of polymer banknotes relate to its durability and the consequent cost saving benefits associated with notes lasting longer. Over ten thousand data points in DLR Analytics™ demonstrate that polymer banknotes last, on average, 2.5 times longer than paper banknotes and that this is a statistically significant difference that stands out despite all the other factors that influence banknote lifetime.

When looking at specific examples of central banks who have transitioned to polymer the actual improvement in note life can be as large as a factor of six times increase. As a result of

There are also more nuanced reasons for making the transition. Between October and February, De La Rue will host three webinars exploring the theme of sustainable confidence when converting to polymer. These webinars cover the 'why' and the 'how' of transitioning to polymer and will share the experiences of central banks, banknote issuing authorities and others involved in the upgrade to polymer banknotes.

The first webinar entitled 'Sustainable Confidence: Why Central Banks Convert to Polymer' will take place on 28th October at 08.00 and repeated at 16.00 GMT. Details on how to register for this event can be found on page 7 of Going Beyond.

Sustainable Commitments

By Maria Atkinson, Government Relations Manager



Making the right choices to reduce our environmental impact and meet customer requirements.

De La Rue is driven by its mission statement: “to enable every citizen to participate securely in the global economy” and in the delivery of this to behave as a responsible business, actively contributing to a safer, more secure and sustainable future. We believe businesses have a responsibility to nurture and build effective partnerships with governments, multilaterals and academia. Through active collaboration, we can build scalable, effective and sustainable development solutions. Therefore, we have made a long-term commitment as a participant of the United Nations Global Compact, a voluntary initiative to align business strategies and operations with the UN’s global principles on human rights, the environment and anti-corruption. We consider these principles as a moral imperative for all: ending poverty, fighting inequality & injustice, ensuring social & financial inclusivity and working towards environmental sustainability to ensure a sustainable future for generations to come.

Sustainable end-to-end manufacturing lies at the heart of De La Rue and we are committed to minimising the impact of our operations on the environment while ensuring the sustainability of the products we offer and the future of our manufacturing sites. For the past decade we have submitted data on our climate change impact to the Carbon Disclosure Project. This project focuses investors, companies and cities on taking urgent action to build a truly sustainable economy by measuring and understanding their environmental impact.

We are constantly working to improve our methods and processes, making both incremental and systemic changes so we can better measure our activities and reduce the environmental impact of our production sites. A significant number of energy measures are being undertaken across our sites. At the site in Malta existing lighting was replaced with more energy efficient lighting solutions. Through this exercise, De La Rue has reduced its annual energy consumption by 630MWh. This is equal to the consumption of around 140 households! The site has also introduced cool roofs which has resulted in lower indoor temperature by as much as 2°C and this has reduced the cooling demand for the building. The chilling system has also been upgraded to be more energy efficient. In December 2019, the site was recognised and awarded the Energy & Water Sustainability Award by the Maltese Energy and Water Agency. All our manufacturing sites have a formal environmental management system and are certified to the international standard ISO 14001.



We work with our customers to reduce environmental impacts from design to delivery; in June 2019, the Central Bank of Samoa unveiled the first carbon neutral polymer banknote to celebrate the XVI Pacific Games, leading the industry, the central banking community and helping to combat global climate change. The 10 Tala note was designed by De La Rue and printed on SAFEGUARD® polymer substrate. We were extremely proud to have been able to work with Carbon Footprint Ltd to make this banknote wholly carbon neutral by offsetting the emissions from its production and delivery. For this banknote, the carbon impact of both the materials and manufacturing process were calculated and offset by supporting a power generation project in Indonesia.

Our SAFEGUARD^{bv} polymer banknotes are also helping many central banks reduce their environmental impact. The lower environmental impact of polymer banknotes is through a combination of factors; greater durability and longer note life, leading to reduced transportation and circulation costs, combined with the benefit of polymer banknotes being fully recyclable at the end of their useful life.

At De La Rue we are committed to reducing the environmental impact of what we do. We accept that whatever we do, all of us can always do more to increase sustainability and reduce our impact on the environment.

LEARN MORE

Links to organisations mentioned in article:

UN Global Compact
www.unglobalcompact.org

Central Bank of Samoa
www.cbs.gov.ws

Carbon Disclosure Project
www.cdp.net

Malta Energy & Water Agency
www.energywateragency.gov.mt/eepi/delarue/

Carbon Footprint Ltd
www.carbonfootprint.com

Building a better mousetrap



We interview Dr Rob Whiteman, Head of Security Features Development at De La Rue Currency and discuss the philosophy behind developing a good security feature.

For the benefit of our readers please could you give us a brief background to yourself and the role Research & Development (R&D) plays within De La Rue Currency?

My technical background is in Physics and advanced materials. I have worked in a range of research and development environments for over 25 years – in academia, in start-ups and FTSE listed companies. I joined De La Rue in 2005, transitioning from the semiconductor and optical communication industry. During my time in De La Rue I have led and overseen a range of security feature developments, both in core and emerging technology areas. I am currently Head of Security Feature Development, and I am fortunate to lead a team of highly capable and committed technologists and scientists.

Research and Development is key to outworking the strategic intent of any company. As market needs evolve, R&D must respond. The very nature of our Currency business dictates that we must keep one step ahead of the counterfeiter, and this naturally provides the impetus and challenge to progress and enhance security feature solutions.

What is the philosophy behind designing a ‘good’ security feature?

A good security feature is an effective security feature. For ‘public’ security features, the selection of sophisticated or hard-to-access technology is only part of the story. The feature must be straightforward to use, and the authentication response must be clear and unambiguous. Public awareness and ease of education is key. If the user doesn’t know clearly what they should be seeing, then the efficacy of the feature is significantly reduced. The authentication ‘trigger’ - be it depth, movement or colour-change - should be clear and engaging. Subtlety opens the door to ambiguity, and hence lowers the barrier to counterfeiters. Indeed, many counterfeits are not perfect copies, they are ‘simulations’, using regular materials that come close in appearance or effect. Hence, when appraising the robustness of any new feature or technology, it’s critical to ask “what is the risk of simulation?”, rather than simply considering the barrier presented to achieving a ‘perfect’ copy. Customisation can assist here; if the technology allows the authentication trigger to be integrated into bespoke visuals, then simulation from commercial decorative films and inks becomes considerably less convincing.

“The feature must be straightforward to use, and the authentication response must be clear and unambiguous.”

Thinking more broadly, there are practical considerations too. Clearly the feature must remain effective throughout the circulating life of the note. A crisp and clear feature on day one is of little use if it quickly wears and degrades such that its visibility is compromised. This again speaks to the need to ensure a clear and consistent authentication response with which the public can readily engage.

How do R&D decide which projects to pursue?

In a commercial environment, R&D activities of any notable size always need to be underpinned by a business case. In De La Rue, the business case is owned by Product Marketing, and built with input from the broader Product function and the wider business. The business case considers the market need, the value to De La Rue, and the alignment to strategic aims. Not surprisingly, there are always more candidate projects than bandwidth allows, so the relative value



“The success of any great technology depends on whether it can be positioned competitively and can be manufactured consistently at the right cost.”

and importance of projects are considered by a Portfolio Review Committee comprising senior stakeholders representing all the Currency functions. It is this committee that ultimately decides.

Central to the business case will be a ‘needs’ or problem statement. The precise technical response that addresses this needs statement may be clear and singular. In other instances, it may be very open and require the team’s experience and expertise in existing and emerging technologies to select and develop the best solution.

To what extent does/should competitor activity influence R&D decisions?

Again, this comes back to the business case. If the competitive activity conflicts with strategic intent, and/or it impacts key revenue streams, then it will gain more focus and priority. However, in a more general sense, awareness of competitor security feature developments provides important context. At some level, regardless of the technology, all suppliers are focused on the same goals – a highly secure, eye-catching technology that is easy to use and authenticate.

As suppliers continue to evolve their technical solutions in response to this challenge, it is vital to know where market expectations sit. The success or otherwise of competitor features informs this benchmark and serves as a marker that we should aspire to exceed. In my view, simply aiming for me-too features with no proprietary advantage is not a sustainable path to success.

What do you think the future holds for polymer security features?

Polymer banknotes provide an unquestionable benefit with regards to their durability. However, whilst they may borrow or inherit established features that are already successfully deployed on paper, polymer banknotes offer new opportunities. As yet, there are no true substrate features – what’s the polymer equivalent of a thread or watermark, for example? The window too is a key aspect of the polymer banknote security, and yet it is relatively under utilised for good and effective transmission features.

The polymer window should be an ideal playground for many of today’s modern optical technologies.

When do you know if a feature is going to be a success?

With experience it becomes easier to read the potential in a technology - its inherent security, its uniqueness, its resistance to simulation, and its ability to deliver an effective authentication trigger that is both customisable and recognisable. This is a strong and critical starting point. The success of any great technology depends on whether it can be positioned competitively and can be manufactured consistently at the right cost.

It is Currency’s robust stage-gate development process that seeks to ensure these metrics are always front and centre as developments progress. In doing so, we are striving to maximise our chance of success. Ultimately though, the key measure of success will be customer satisfaction and strong and sustained market share.



About De La Rue

De La Rue provides governments and commercial organisations with products and services that underpin the integrity of trade, personal identity and the movement of goods. Our market leading Currency Division provides fully finished banknotes, secure polymer substrate and banknote security features to half of central banks and banknote issuing authorities around the world.

De La Rue is the largest commercial printer of banknotes, producing up to 7 billion banknotes per year for half the issuing authorities in the world and designing a third of all banknotes in circulation. Our printing facilities are in Sri Lanka, Kenya, Malta and the UK. In Sri Lanka and Kenya the operations are joint ventures with the governments of those countries, contributing to the local economies and providing the benefits of local banknote supply.

Our global manufacturing footprint provides flexibility, contingency and decades of expertise associated with how to print a diverse range of banknotes globally. This combines with exceptional and seamless product design to ensure central banks have world leading banknotes to be proud of.



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We welcome your suggestions, ideas and comments. Please send these to [Nikki Strickland](#) or [Richard Sokl](#).

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