



Green
Gift Cards

THE TOTAL COST OF "CHEAP"

*Why short-run digital print - not high-volume
forecasting - is the future of gift, loyalty and
membership card production*

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EXECUTIVE SUMMARY

For nearly two decades, Green Gift Cards has been trying to answer one question the gift card industry would rather not ask out loud: what does a gift card really cost? Since 2006 we have argued that paperboard, not plastic, is the right substrate for gift, loyalty and membership cards - and the industry has largely come round to that view, first in the UK, then increasingly across Europe and, to a smaller degree, in the US. That argument is more or less won. The substrate war is over.

The next fight is about how cards are made, not what they are made from. This paper argues that the long-run, forecast-driven production model the industry has relied on for decades - high-volume manufacturing, ordered months in advance and warehoused until it sells - is not the economical choice it appears to be on a quote. It is a hidden-cost model, propped up by a unit price that looks cheap in isolation and often is not once the whole picture is accounted for.

Working with Ricoh's Pro C9500 digital press and its MediaMax heavy-media-handling technology, we have spent the past four years proving an alternative: cards printed in short runs, on demand, driven by actual sales data rather than forecasts - the same shift book publishing made when it moved from print-and-pulp to print-on-demand. We believe card production is at the same inflection point publishing reached a decade or so ago, and we are publishing this paper to put that argument in front of the brands, procurement teams and card programme owners who decide where the next decade of print spend goes.

"We are not publishing this to be agreed with. We are publishing it to be argued with - by the people who actually carry the cost of getting this wrong."

SECTION 01

THE INDUSTRY WE INHERITED

Gift, loyalty and membership card production has historically followed the economics of commercial litho printing generally: cost per unit falls as volume rises, so the incentive has always been to order in bulk, months ahead of a campaign or programme launch, against a sales forecast. Plastic (PVC) substrate reinforced this further - the tooling, minimum order quantities and long lead times of traditional plastic card manufacturing only make financial sense at scale.

The result is a global card supply chain built around forecasting rather than responding to what actually sells - the print equivalent of building a warehouse before you know how many customers will show up. It is a model that made sense when digital print could not handle premium, heavy-caliper media at commercial speed and quality. That constraint no longer holds, and yet the ordering behaviour it created has largely persisted out of habit.

SECTION 02

THE MYTH OF "CHEAPER AT VOLUME"

On the face of it, high-volume litho or plastic production looks cheaper than short-run digital - the quoted unit price is often lower. It is also, in our view, the wrong number to be comparing. A true cost comparison has to include everything that happens to a card between the moment it is manufactured and the moment it is either sold or written off, because in a forecast-driven model, a significant proportion of what is produced never reaches a customer at all - it goes into storage, to be called off as inventory sells through.

Once that is accounted for, the picture changes:

Cost driver	High-volume litho / plastic model	Short-run digital / paperboard model
Unit price at point of order	Lower per card - the number everyone quotes	Higher per card in isolation, before TCO is applied
Inventory carried	Months of stock, ordered against a forecast	Days of stock, ordered against actual sell-through
Warehousing, insurance, pick & pack	Ongoing cost for as long as stock sits unsold	Minimal - cards are made close to the point of need
Obsolescence risk	Full exposure to Ts&Cs changes, rebrands, discontinued ranges	Near-zero - nothing is made until it's needed
Creative & data flexibility	Fixed design, fixed run - costly to change mid-cycle	Variable design and variable data as standard
Speed to market ¹	Typically ~4 weeks - litho's lead time, on paperboard or PVC alike	10-12 working days, direct to store
Environmental footprint	8.14 gCO ₂ e per card - same Invercote paperboard, litho-printed ¹	4.28 gCO ₂ e per card - ~48% lower, same paperboard, digitally printed ¹

¹ End-to-end production time - ink on paper, punching to card shape, and personalisation - not simply time in a print queue.

Seven factors, in particular, are routinely left out of the "cheaper at volume" calculation:

- **Total cost of ownership** - not all stock produced reaches the retail channel; a high proportion sits in storage waiting to be called off as inventory sells through.
- **The carrying costs that come with that storage** - insurance, building costs, pick-and-pack, and delivery to store.
- **Obsolescence risk** - Ts&Cs changes, rebrands, and outdated stock that has to be written off.
- **Restricted creative flexibility** - long runs discourage multiple designs or demographic variants.
- **Higher environmental impact per card** - even holding the paperboard constant, litho printing very nearly doubles the carbon footprint of the same digitally-printed card.
- **Slower speed to market** - long-run litho production is simply not built for pace, whether the substrate underneath is paperboard or PVC.
- **The knock-on cost of getting the forecast wrong in either direction** - too much stock, or not enough at the moment demand actually appears.

Digital, short-run production does not eliminate cost. It relocates it - away from storage, insurance and write-offs, and into a unit price that reflects the true, lower total cost of getting the right card, in the right design, to the right place, when it is actually needed.

The question we'd ask your CFO

There is a simpler way to make the same point, and it is the one that tends to land hardest once it reaches the boardroom rather than the print buyer. When a brand places a high-volume, forecast-based card order, it typically pays for that stock in full, months before a single card is sold. That stock - real cash, already spent - then sits on a pallet in a warehouse, waiting to be called off as sales trickle through. It earns no interest. It generates no return. For as long as the forecast takes to sell through, it is the brand's own money, parked, doing nothing.

Ask a CFO, in isolation, whether they would sanction paying upfront in full for goods that then sit unused in storage for months, with no way to recover that cash early if the forecast runs long, and few would call it sound treasury management. Framed as "gift cards," it is filed away as a routine cost of doing business. Framed as "cash tied up on a pallet in a warehouse," it looks like exactly what it is: working capital taken out of the business and handed to a warehouse, on the strength of a forecast rather than a customer order.

" Ask your CFO whether they would approve tying up six or seven figures in an asset that earns nothing and cannot be recovered early. Now tell them that is exactly what a forecast-based card order does - every single cycle.

Short-run, on-demand production removes that trade almost entirely. Cash is committed only when stock is actually called off against real demand, which means it stays in the business, working, for longer - and it is precisely the shareholders' money, not an abstraction, that benefits.

A genuine counterpoint: merchandising and replenishment cost

We want to raise a genuine consideration against our own argument here, rather than leave it for someone else to raise as a "gotcha." Little-and-often production only delivers the total-cost-of-ownership benefit this paper describes if little-and-often replenishment is actually cheaper to execute - and for one significant part of the market, that is not automatically true.

Third-party gift card malls - the multi-brand card racks found in supermarkets and other large-format retail - are typically restocked by a merchandiser who visits a store periodically, tops up dozens of pegs across many brands in a single visit, and moves on to the next store. For that operator, the visit itself is the expensive part, not the cards on the peg. If short-run production simply means smaller quantities delivered on the same merchandising cadence, or worse, more frequent merchandiser visits to avoid empty pegs, the cost of replenishment can rise even as the cost of production falls. Anyone arguing for short-run digital production has to be honest that this is a real trade-off for card mall operators, not a rounding error.

Own-store gift card programmes sit on the other side of that line. When a retailer sells its own branded card in its own stores, restocking the till point or gift card display is already folded into business-as-usual store operations - existing staff, existing footfall, existing back-of-store stock handling. There is no separate merchandiser visit to schedule or cost, so smaller, more frequent restocks carry a much smaller marginal cost than they would for a third-party card mall.

There is a second-order point here that we think the industry has not yet properly confronted. Because the Pro C9500 can ship direct to store from the back of the press, the replenishment model itself is now a variable, not a constant. The default assumption has been that a merchandiser tops up multiple pegs across multiple stores in a single visit, on a fixed cycle - typically quarterly. But if cards can arrive at store level in smaller, more frequent batches, direct from

production, restocking can shift from a scheduled merchandising visit to something store staff handle themselves as part of everyday stock management, much as they would any other fast-moving till-point product. We are not certain how far this already happens in practice, or where it doesn't; that is precisely why we think it deserves scrutiny. The debate this paper wants to start is not only about how cards are produced, but about the inventory control workflow built around them - and for card mall operators in particular, that workflow may need to be redesigned before the production-side savings can be fully realised.

SECTION 03

A LESSON FROM PUBLISHING

Book publishing solved a version of this problem roughly a decade ago. For most of its history, the industry printed in bulk, guessed at demand, and pulped what didn't sell - a wasteful, capital-intensive model that print-on-demand technology broke apart. Publishers no longer need to gamble on a print run months before a book reaches a shelf; they can print against real orders, in whatever quantity the market actually calls for, and carry a fraction of the inventory and waste they once did.

Gift, loyalty and membership cards are following the same path, for the same reason: the technology to print short runs economically, at commercial quality, finally exists. The parallel is not cosmetic. Both industries share the same underlying economics - a physical product, a print origination cost, a shelf life, and a forecasting problem - and both had to wait for digital print technology to catch up with heavier, more premium media before the shift became commercially viable. For books, that meant matching the print quality and paper stocks of traditional offset. For cards, it has meant matching the heavy-caliper board and tactile, premium finish that plastic conditioned the market to expect.

SECTION 04

THE TECHNOLOGY UNLOCK

That is the gap Ricoh's Pro C9500 digital sheetfed press, together with its MediaMax heavy-media-handling kit, has closed. The Pro C9500 handles substrate up to 600 micron natively for card applications; with MediaMax fitted, that extends to 800 micron and 600gsm - heavy enough for premium paperboard applications that were, until recently, simply not achievable on a dry-toner digital press.² A newer addition, the Matte Fuser Belt, lets the same platform switch between gloss and an offset-like matte finish, closing one of the last cosmetic gaps between digital paperboard cards and traditional litho-printed plastic.³

There is a second capability that has not had enough attention: the Pro C9500 prints variable data - PAN, PIN, sequential numbering, transaction data - inline, on the same pass as the design itself. Litho, and a number of legacy digital workflows, still require that personalisation step to be run separately, offline, after the base design is printed. Handling it in a single pass removes that second process entirely, which saves both the production time and the energy it costs to run it.²

This is not a case I am making from the outside. I worked hands-on with Ricoh on the Pro C9500's development ahead of its launch at Drupa 2024 - the same show at which a number of card producers' investment in the press was announced - and have stayed close to the engineering and commercial thinking behind MediaMax ever since. The argument in this paper is built on that experience, not just on the industry's public case studies.

The relationship behind this paper played out publicly at Ricoh's first HENKAKU Live webinar in July 2026 - Ricoh's new webinar series for print service providers - where I joined Ricoh's Evelyn Truter to talk through exactly this model:

"Wherever Ricoh has sold a C9500, that PSP now becomes our supply chain - and we've got that across the UK, Europe and the US. It allows my business to grow, and allows us to produce where our customers are, which keeps the CO2 down."

Graham Lycett, Green Gift Cards, speaking at Ricoh's HENKAKU Live webinar, July 2026⁴

That point matters because it is not only Green Gift Cards' case to brands - the same economics apply from the supply side too: wherever Ricoh has sold a C9500, there is a possible new revenue stream for that print service provider, filling capacity with short-run gift card demand it wouldn't otherwise see.⁴

SECTION 05

THE SUSTAINABILITY LEDGER

The environmental case has moved well past the point of debate, but most of the industry still argues it at the wrong level of resolution - paperboard versus plastic, full stop. An independently assured carbon footprint study of the Green Gift Card, commissioned from CarbonQuota, assessed against the GHG Protocol Product Standard, ISO 14044, ISO 14067 and PAS 2050, and reviewed by Dr Matt Fishwick and Dr Matteo Cossuta, lets us separate two variables the industry usually blurs into one: substrate and print method.¹

91%

lower carbon vs plastic: 4.28 vs 46.97 gCO₂e per card, paperboard vs PVC, both digitally printed¹

~48%

lower carbon vs litho: 4.28 vs 8.14 gCO₂e per card - same paperboard, digital vs litho print¹

380T

of plastic gift-card waste sent to UK landfill since 2017⁵

Switching only the substrate - from PVC to Invercote Duo paperboard, with digital print held constant - cuts the footprint from 46.97 gCO₂e to 4.28 gCO₂e per card, a 91% reduction.¹ Switching only the print method - from litho to digital, with paperboard held constant - very nearly halves it again, from 8.14 gCO₂e to 4.28 gCO₂e per card, before any change of material at all.¹ The two effects compound: it is not only what a card is made from that lowers its carbon footprint, but how, and - for the argument this paper is making - increasingly a question of when and in what quantity it is made.

For the purpose of the CarbonQuota study, both effects are amplified by where the cards are produced: Ricoh's Telford, UK facility runs on 100% renewable electricity, 82% wind power drawn from the grid and 18% generated on site by solar PV.¹

One nuance is worth confronting directly rather than leaving for a critic to raise: on a strict, end-of-life-only view, PVC actually scores better than paperboard under the IPCC's GWP100 methodology, because stable, unincinerated plastic does not decompose - and therefore does not release greenhouse gases - for up to 500 years.¹ That is a genuine feature of how GWP100 accounting works, not an error in the study. It is also, in our view, exactly the problem it appears to solve: a material that "scores well" by persisting unchanged in the ground for five centuries is describing a plastic waste and microplastic pollution problem, not a climate solution. We would rather be measured against a standard that penalises persistence than credited for it.

Paperboard cards made from Invercote - the board from Holmen Board and Paper that Green Gift Cards uses - are FSC- and PEFC-certified, fully recyclable, and compostable under industrial conditions (EN 13432). None of that is achievable with PVC, which is not commercially viable to recycle. That is why we consider the substrate argument already settled - the open question is only how fast the rest of the industry catches up.

Digital, on-demand production adds a second sustainability lever on top of the substrate and print-method gains above: it removes the overproduction that a forecast-driven model builds in by design. A card that is never made cannot be pulped, warehoused, or landfilled. That is the same logic that made print-on-demand a genuine sustainability story for book publishing, and it applies with equal force here.

The waste multiplier: what litho actually has to make

Carbon isn't the only place the gap shows up. Two live UK litho production quotations, obtained directly by Green Gift Cards from its own approved litho suppliers in early 2026, show how much litho has to physically over-manufacture just to service short and mid-length runs - independent of, and additional to, the carbon case above.⁶

3.30x

manufactured vs ordered on a
15,000-card, three-version short
run⁶

70%

of everything litho printed on that
run was never sold⁶

1.74x

manufactured vs ordered even on
a 100,000-card single-version
long run⁶

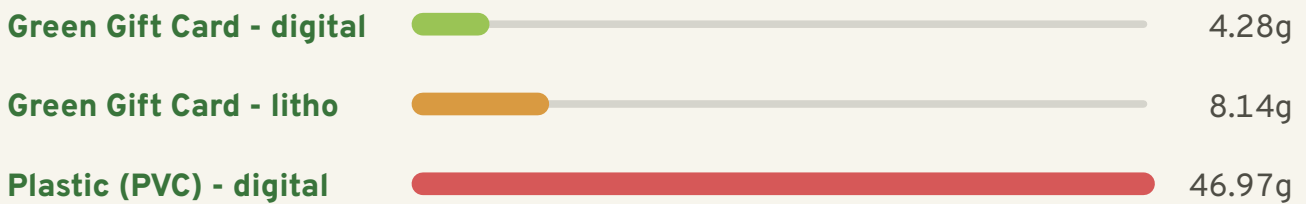
On the 15,000-card order, the quotation specified enough sheet stock to produce 49,500 cards - 3.30 times what was ordered, with 34,500 cards, 70% of everything printed, never sold. On the 100,000-card order, the ratio fell to 1.74x, with 43% of output never sold. Smaller, more varied runs waste more because make-ready is largely fixed per version, not per card - the shorter and more fragmented the run, the worse the multiplier gets.

These figures are indicative, calibrated to two real commercial quotations rather than a theoretical minimum order quantity, and they sit alongside - not on top of - the carbon figures already cited above: CarbonQuota's 8.14g gCO₂e per litho card already amortises this production waste into its substrate and consumables coefficients, so the two data points describe the same underlying effect from different angles rather than double-counting it.¹ Digital, on-demand production sidesteps the multiplier altogether - it manufactures to the order, not to a make-ready-driven minimum.

See the numbers for yourself

We're confident enough in this argument that we built the numbers out ourselves, rather than asking anyone to take our word for it. The two exhibits below use exactly the figures already cited in Section 05 above - nothing new, nothing adjusted - laid out so the gap is easy to see at a glance.

CARBON FOOTPRINT PER CARD DELIVERY (GCO₂E)



LITHO'S MANUFACTURING MULTIPLIER – CARDS MADE VS. CARDS ORDERED



15,000

Cards ordered

49,500

Litho must make

34,500

Never sold (70%)

Both exhibits draw on the same sources cited throughout this paper: the CarbonQuota carbon footprint study (Project LVW01_004) for the emissions figures, and two live UK litho production quotations obtained directly by Green Gift Cards from its own approved suppliers for the manufacturing multiplier.^{1,6} We hold the full calculation behind both on file and are happy to walk any brand, procurement team or journalist through it directly - get in touch.

SECTION 06

PROOF, NOT PROMISES

This is not a theoretical case. Tag Systems UK - part of AUSTRIACARD HOLDINGS and one of Europe's largest gift and loyalty card manufacturers - invested in a Ricoh Pro C9500 at its Leyland facility specifically to co-develop this capability with Green Gift Cards, going live in late 2024.⁷ Multiple print service providers across the UK, Europe and the USA - both new and existing Ricoh customers - are already exploring the same commercial and sustainability upside on the same platform.⁴ That shift is already visible at market level: board-based substrates now account for roughly 95% of the UK gift card market, up from around 75% just two years earlier.⁸

The clearest recent proof point is Clarins. Ahead of the 2025 festive season, Clarins replaced its plastic gift cards with Invercote Duo 660 micron paperboard across UK retail and online, working with Green Gift Cards and Ricoh's digital print technology, including digital foil enhancement on premium designs.⁹ Two production runs delivered over 20,000 cards across 84 unique variants built from four core designs, distributed to more than 20 UK outlets - including versions personalised with specific store details - while eliminating the excess inventory a single high-volume forecast run would have required, and achieving the same order of carbon reduction against PVC that underpins this paper (approximately 90%, per Clarins' own case study).⁹ In Clarins' words, the approach let the brand "align our gift card programme perfectly with Clarins' sustainability goals - without compromising on luxury, personalisation or quality."⁹ Eighty-four variants across twenty-plus stores is not a run a forecast-driven, high-volume order would ever have justified - it is only viable because production is short-run and on demand.

Green Gift Cards' own track record reflects the same shift: two Highly Commended accolades at the 2023 GCVA Hall of Fame Awards, for Best Industry Innovation (anti-fraud foil scratch-off technology) and Manufacturer of the Year, following recognition at the GCVA Hall of Fame in 2022.¹⁰ None of this required brands to compromise on premium look or feel - which was, for a long time, the last credible objection to paperboard.

SECTION 07

WHAT THIS MEANS FOR BRANDS

For the brands, retailers and card programme owners who actually commission this production, the practical implications are straightforward:

- Speed to market - 10–12 working days end-to-end (ink on paper, punching, personalisation) for a digital paperboard run, against roughly 4 weeks for a comparable litho run. Litho's lead time doesn't change whether it's printing on paperboard or PVC - it's the print method, not the substrate, that determines speed - and delivery is direct to store, based on what sold the previous month.
- Creative and data flexibility - multiple designs, regional variants, and demographic-targeted artwork, without the cost penalty a long litho run imposes on design changes.
- Lower working capital tied up in card stock, because production is called off against actual sell-through rather than a forecast made months in advance.
- Materially lower reputational and regulatory risk from stranded stock - no warehouse full of cards carrying last year's Ts&Cs, logo, or promotional offer.
- A sustainability story that is verifiable, certified and increasingly expected by consumers, procurement teams and ESG reporting alike.

None of this is a niche efficiency gain. It is a different operating model for how card programmes are planned, funded and replenished - lean, pulled by real demand, in the same way retail and publishing supply chains have already moved.

A call to the industry

We think the biggest brands in gift, loyalty and membership cards are still pricing this decision on the wrong number. A lower unit price at high volume looks like the responsible, cost-conscious choice - right up until the warehousing, insurance, obsolescence and waste it creates are added back in. We would rather have that argument in the open than continue watching it play out quietly, in written-off inventory, one procurement cycle at a time.

So here is the debate we want to start: if your gift card programme were designed today, from scratch, around what actually sells rather than what you predict will sell - would it look anything like the one you are running now? We do not think it would, and we would like to hear why we are wrong from anyone who disagrees.

"This paper is free to share, quote and challenge. If your experience contradicts it, we want to hear that too - that is the debate this paper exists to start."

ABOUT GREEN GIFT CARDS

Founded in 2006, Green Gift Cards has been at the forefront of the shift from plastic to paperboard in gift, loyalty and membership card production in the UK, influencing similar moves across Europe and, to a smaller degree, in the US. Working with partners including Ricoh and Holmen Board and Paper, Green Gift Cards produces plastic-free, recyclable and compostable cards, and has been recognised twice at the GCVA Hall of Fame Awards for innovation and manufacturing excellence.

About the author

Graham Lycett is Founder and CEO of Green Gift Cards and Enviricard. He writes regularly on sustainable card production and digital print disruption, including as a guest contributor for Ricoh Europe and Print It Reseller, and has spoken on the subject at many events.

REFERENCES

- 1 CarbonQuota (2024) *Product Carbon Footprint: Green Gift Card – Digital* (Project LVW01_004). Commissioned by Green Gift Cards Limited, September 2024.
- 2 Ricoh Europe / Ricoh United Kingdom (2024–2025) *RICOH Pro™ C9500 product pages and MediaMax product announcements*.
- 3 Ricoh Europe (2024–2025) Coverage of RICOH Pro C9500 enhancements, including the Matte Fuser Belt. *Print Monthly*.
- 4 Lycett, G. and Truter, E. (2026) In conversation at Ricoh's HENKAKU Live webinar, July 2026. Transcript held on file by Green Gift Cards.
- 5 Ricoh United Kingdom (2024) *How Digital Print Is Driving Green Gift Card Disruption*.
- 6 Green Gift Cards (2026) *Live UK litho production quotations for CR80 board gift cards*. Obtained directly from approved and existing litho suppliers, March–April 2026. Held on file by Green Gift Cards; indicative figures, supplier and end client identities withheld commercially.
- 7 Ricoh Europe (2024) *Tag Systems UK Spearheads Sustainable Gift and Loyalty Card Innovation with Investment in a Ricoh Pro C9500*, December 2024; and PrintWeek (2024) *Tag Systems Targets Short-Run Gift Cards with Ricoh Install*, December 2024.
- 8 Lycett, G. (2026) Quoted in *PrintWeek* on the UK gift card market's shift from board substrates, ~75% of the market in 2022 to ~95% today.
- 9 Green Gift Cards (2026) *Clarins & Green Gift Cards: A Sustainable Gift Card Partnership*, January 2026.
- 10 Green Gift Cards (2023) *Green Gift Card Triumphs at GCVA Awards*; and GCVA Hall of Fame Awards (2022).