



A GUIDE TO ISSUING SUSTAINABLE CARDS

A best practice paper from the Greener Payments Partnership

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INTRODUCTION

The use of plastic by the payments card's industry cannot ignore the current global conversation about the effects of plastic on the environment.

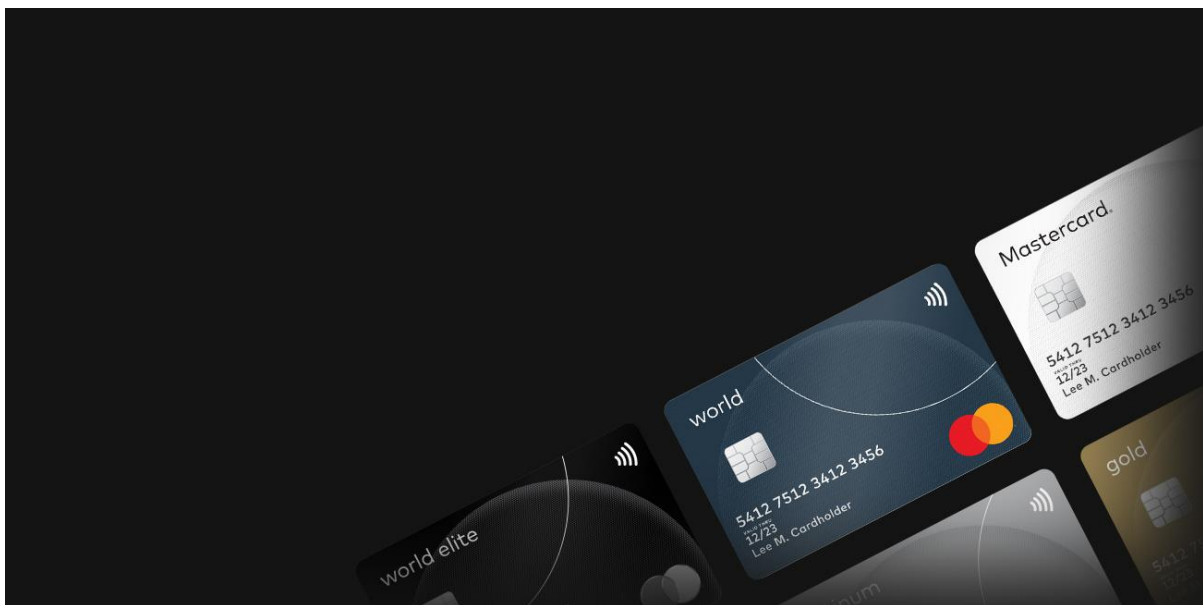
Over 3 billion plastic payment cards are shipped worldwide, annually. These cards are quickly replacing cash on a global scale as a more convenient, secure, and sustainable way of paying.

Industry and regulatory bodies are setting objectives and plans which aim to reduce the use of plastic, increase its re-use or improve its recyclability at the end of life.

In light of this, the payment cards' industry must take decisive steps to introduce a new generation of more environmentally friendly solutions for card bodies.

Since 2018 Mastercard and its partners have been working jointly, via the Greener Payments Partnership (GPP), to develop better, more sustainable card options. Current product offerings and underlying research demonstrates that it is possible to create cards that meet objectives such as improved recyclability or renewable sourcing, at a quality and price point comparable with existing materials.

The life span of one card is typically three years. With each containing approximately 5 grams of plastic, that equates to 15,000 tonnes each year, with most ending in landfill at end of life. This provides a significant opportunity for the payment card industry to affect change.



CURRENT 'SUSTAINABLE' CARD MATERIAL OPTIONS

rPVC

Recycled PVC (rPVC) is a good alternative to first use PVC from cost, properties, and process perspectives. While rPVC has the same end of life challenges as first use PVC, rPVC is a simple change for a measurable improvement, as 100% of the card body can be made out of recycled PVC.

The principle of rPVC plastic is to use post-industrial waste rather than scrapping it, thus leading to key advantages in the context of environmental protection: Reducing waste, limiting use of fossil resource, and reducing the carbon footprint and water use, rPVC has very similar characteristics and properties to PVC, which makes it easier for manufacturers to introduce into their production flows.



The use of recycled materials makes it possible to actively participate in the reduction of plastic waste and therefore plastic pollution. PVC recycling reduces the need for more oil extraction that supports the creation of new PVC.

PLA

Polylactic Acid (PLA) is a Bio sourced plastic which can be used as an alternative to traditional fossil fuel-based plastics. PLA is produced from either corn or sugar starch, with the plant protein used as animal feed. This makes PLA arguably the most natural alternative to PVC currently available for use in payment cards.

As the plant crops used in the manufacture of PLA grow, they actively remove carbon dioxide (CO₂) from the environment. At end of life if a 100% PLA card is incinerated, it releases no toxic gases, just CO₂.



If the cards are collected and processed in the correct conditions, they can also be industrially composted.

PETG

Polyethylene Terephthalate (Glycol) (PETG) is an established alternative to PVC for payment cards. Markets such as Japan have long adopted PETG, meaning it is the longest serving 'sustainable card' in the market.

PETG, contains no chlorine and no styrene meaning it has better end of life pathways, whether incinerated or placed in landfill. It is also a more widely recycled material and can, in some cases, be integrated into widely available PET recycling streams.



PETG may not have the same attention-grabbing qualities of some of the alternative sustainable materials, but nonetheless it is a very attractive proposition.

With its strong potential for recyclability – both mechanically and following Mastercard’s research program chemically, PETG can be a step towards introducing full circularity.

'Ocean Sourced/Bound' (HDPE, rPET)

'Ocean sourced' or 'Ocean Bound' cards are available in either HDPE or rPET forms.

The core benefit of these products is that they actively remove plastic waste from the environment, the majority of which is post consumer waste, and give waste material a second life (as per any recycled plastic/material).



The raw materials, such as plastic bottles, can be directly retrieved from the ocean or from coastal areas where they are likely to enter the Sea/Oceans.

Wooden cards...and more

Wood is a very environmentally smart material and one of very few raw materials when used in card production, if not the only one, creating a carbon sink effect during the production process. Raw veneer is a 100% unaltered plant material and a fully renewable resource when sourced from certified sustainably managed forests.



More materials are being developed and researched all of the time and the list of options continues to grow. The products listed here are all available today but equally there will be new options that are not listed as knowledge and skills continue to expand in the area of sustainable cards.

MATERIALS NOT CURRENTLY CONSIDERED AS SUSTAINABLE

Metal

Production of metal cards requires significantly more energy than is required to produce a PVC card, thus any metal card has a higher energy footprint than a PVC card and cannot be endorsed from a sustainability perspective. There are strong arguments regarding the recyclability of metal, however these could only be considered relevant if a program to collect and recycled expired payment cards was in place.

Degradable PVC

PVC products made with additive-technology and available on the market include film applications such as shopping bags, agricultural mulch films and, most recently, certain plastic bottles. Experts from the plastics industry, waste management, and environment protection voice serious concerns about these products. They claim to be “degradable”, “oxo-degradable”, “oxo-biodegradable”, or “oxo-fragmentable”, and sometimes even “compostable”, without sufficient evidence for the claims made.

These products are made from conventional plastics and supplemented with specific additives in order to mimic biodegradation. In truth, however, these additives only facilitate a fragmentation of the materials, which do not fully degrade but break down into very small fragments that remain in the environment – a process that would be more accurately described by the term “oxo-fragmentation”.

Claims of “oxo-degradability” might sound appealing, yet they can be misleading due to the absence of a standard specification i.e., an explicit set of requirements to be satisfied by the product.

Degradable PVC that is embedded with microorganisms to facilitate degradation processes pose significant unintended consequences. These materials are unlikely to completely degrade in the open environment and ‘standard’ landfill settings. While they may meet standards of degradation in controlled laboratory conditions, they may pose a significant threat to release PVC microplastics into the environment if degradation does occur outside of controlled conditions.

To our knowledge, no oxo-degradable polymers on the market have been shown to degrade fully in any environment of release and reports based on lab conditions only are not compelling, when ‘real world’ end of life pathways are considered.

CARD COMPOSITION CONSIDERATIONS

When considering 'Sustainable cards' they are always viewed through the lens of a PVC 'baseline'. Cards that have a sustainability benefit over this PVC baseline can be considered to be more sustainable.

However, not all cards are created equally. Mastercard and our GPP partners work with a variety of materials and product compositions, there is no 'best material'. This position enables choice and scalability within the market without placing the emphasis on any one solution. Whilst there may not be a 'best' product, there are clearly 'better' products which we would encourage customers to consider.

Some considerations, such as card composition, may only become apparent when the full lifecycle of a card is considered. For example, a card made from a mix of materials, such as PLA or rPET core with PVC overlays, may be beneficial when considering the card creation and personalization phase of a card's life. However, if end of life is also considered this may introduce unintended consequences.

Incinerating this card or placing it in landfill may introduce the possibility of toxins making their way into the environment. Industrially composting the card will likely not be an option due to the protective PVC layer and similarly making a card from two separate plastics will make recycling a more complex process.

There are other similar product construct examples, which are all valid. These factors only come into play when all aspects of the card are considered. Issuers are advised to review and choose the product which best suits their needs, considering all factors.

CARD SOURCING CONSIDERATIONS

Sourcing cards with sustainability at the forefront of your mind need not make it a difficult or complex problem to solve. Traditional questions such as quality, cost, time to market etc are all still vital. Supplementing these with some new, basic qualifying questions will help you make the best decision for you and your customers.

Whenever possible, it is advisable to source cards locally. It may be possible to source cards at a lower unit price from a vendor across the border but when you consider the environmental impacts of transporting cards from one country to another via freight plane or ship on overall sustainability it is likely to impact your view on the best choice.

None of these questions or answers necessarily preclude any product or vendor choice, they just ensure whatever choices that are made are done in a fully informed way.

If card transportation is unavoidable, it can still be mitigated. Place card orders earlier than usual so that they may be transported via sea rather than air freight. Any transportation impacts could also optionally be offset, although reducing carbon impacts is always preferable to offsets.

DESIGNING FOR SUSTAINABILITY



“Brands that deliver on pursuit of purpose, that drive a culture of sustainable innovation are the front runners in consumers' eyes – and they are watching.”

More than ever before, consumers are deeply concerned about the environmental impact in every decision they make. In one survey, 66% of all respondents, and 75% of millennial respondents, said they consider sustainability when making a purchase.

This ‘eco-awakening’ is catching on. If good is the new cool, sustainable card design soon will be table stakes as consumers demand brands to take action to combat the climate crisis.

In fact, a card’s environmental impact can drive brand loyalty and play a key role in informing purchasing decisions, making sustainability not just a nice feature, but rather critical for business to be in line with CSR and/or ESG strategies

Yet, achieving sustainable design can be challenging. Many of the materials and processes that enhance the look and feel of a card, often run counter to sustainable ‘best practices’. Card manufacturers’ abilities to offer sustainable options may vary widely. The right card manufacturer should share your commitment to sustainability and offer the most sustainable products in the market. Insist they share all the relevant data on a product’s environmental effectiveness. Can a product, for example, be re-resourced to a find better, more effective solution?

It takes thoughtful, skilful design to create cards that have equal measure design (brand), environmental and business impact without compromise to each. Keep in mind, a card relegated to the bottom of a wallet, regardless of its sustainable pedigree, is a waste of resources, and does little for your brand or business.

While this document focuses on the environmental impact of the physical card itself, it is important to look across the entire cycle of card issuance. From chips, to production, shipping, fulfilment, usage, and recycling, and look for ways to impact each.

Considerations to make to achieve a more sustainable card:

- Select water-based or vegetable-based inks. Inks made from carbon captured ink are a new option that should be investigated.
- Beware of novelties that require batteries, complex manufacturing processes, toxins, waste, etc.

- Foils, laminates, spot UV and other finishes, often make a card look and feel more premium, but use them sparingly.
- Metal cards, as already discussed is not the best sustainable choice. The good news is that to millennials and younger consumers, modern luxury is now being environmentally responsible. These audiences will forgo 'status' and 'premium' for more sustainable options.
- A card's packaging is one of the biggest use of resources in the card lifecycle. The 'unboxing' experience is an effective way to strengthen the consumer experience, however, carefully evaluate the materials, shipping, and end-of-life waste, etc.
- Think beyond the physical card. Build sustainable value propositions around your card program. Promote with purpose driven marketing to build consumer loyalty, far beyond the transaction.



Doconomy, launched in 2019, combines sustainable card materials – PLA, Carbon captured 'Air ink' and a robust value proposition that helps offset your purchases' carbon footprint.

BEST PRACTICE ON SUSTAINABLE IN MARKETING



63% of consumers feel like sustainability isn't their responsibility but rather the responsibility of businesses and brands.

Kantar

The climate crisis is one of the most defining issues of our age and consumers are expecting governments and brands to play a role in fixing it.

The number of ads that address social and environmental issues has tripled since 2016, but consumers aren't convinced of brands' intentions. In fact, 64% of people globally worry that brands are involved in these issues for profit only. And many don't trust the claims." How can you address sustainability in your campaigns in a way that is authentic for your brand and motivates people to behave sustainably?

According to Kantar Affective research, change is encouraged when we inspire with positive behaviour, "with smiles and humour" as opposed when we invoke guilt. Be positive and hopeful in your messaging.

It's important to recognize that not everyone is on the same journey towards sustainability. Most are committed to sustainability, yet even they don't always act.

Here's a few simple ways to market to your audience to make them adopt sustainable behaviours

- Be authentic to your brand – Don't "greenwash"
- Understand your audience – Are they engaged or dismissive?
- Be constructive – Show them how they can make a difference
- Be hopeful and confident – Make them feel empowered
- Be relatable – Find the right tone

Finding the right balance of emotion and rationale, to make your audience act is always easy. The good news is that aligning your brand with a strong brand purpose like sustainability is good for your business and will increase brand value.

<https://www.weforum.org/agenda/2021/10/overcoming-3-hurdles-to-building-sustainable-products-and-brands/>

MASTERCARD SUSTAINABLE CARD BADGE

Building upon its sustainability initiatives including the Greener Payments Partnership and Priceless Planet Coalition, Mastercard has introduced the Mastercard Sustainable Card Badge. This badge is part of our new certification program to encourage the use of more sustainable materials in card manufacturing.



The Sustainable Card Badge is a new Mastercard card mark that will be made available to qualified card manufacturers and issuers who reduce first use PVC in plastic payment cards. Through this program, issuers have access to an approved list of vendors and alternative sustainable materials found in the Mastercard Sustainable Materials Directory.

The 'Mastercard CEC Approved Sustainable Cards Product List' is available for Mastercard customers to download via Mastercard connect. This document lists all vendor products which qualify to use the sustainable card badge and updated periodically.

The certification program and the Sustainable Card Badge will allow issuers to offer more eco-friendly card options such as ethically, recycled, bio sourced, ocean sourced, or chlorine free materials to signal their commitment to providing more sustainable solutions for their cardholders.

What does it signify?

The badge signifies that the card product that the badge appears on has been independently assessed against established sustainability industry criteria and has been classified as more sustainable than the standard first use PVC card product. The assessment includes a detailed analysis of not only the card material, but also the production process within the specific factory that produced the card.

Why is Mastercard doing this?

Mastercard wants to support both card vendors and card issuers who wish to deploy more sustainable card products through establishing environmental best practices that aid the global adoption of sustainable payment solutions. The addition of a sustainable card badge establishes an industry baseline and process for card vendors to be assessed against and acts as a 'certification mark' they can incorporate into their communications with card issuers. Card issuers can then use the badge on their approved products, along with any required disclaimers explaining the badge meaning. This will drive awareness and help market the sustainability of card issuer's products.

Who can use the badge?

Vendors that produce Mastercard branded products and who have been assessed and qualified by the CEC scheme can use the badge to promote qualified products. Examples of products which may qualify are those made from recycled materials or bio sourced materials. There is no definitive list of materials that may or may not qualify as each product is evaluated based on its individual merits. Card issuers that source one of the qualified card products may optionally use the badge, along with any required disclaimers explaining the badge meaning to cardholders. Only card products that have been qualified through the Mastercard CEC program are eligible to use the badge. Design criteria are included within the Mastercard **Card Design Standards**.

Countries may have local consumer protection or environmental laws, rules, regulations, or guidelines (“Legal Requirements”) that apply to the use and marketing of environmental claims, including the use of a badge. Some jurisdictions require accompanying statements disclosing the meaning of the badge, Card vendors and Issuers are solely responsible for their own compliance with these Legal Requirements, including the manner in which they use and display the badge mark and the use of accompanying disclaimers in close proximity to the badge. Below are sample statements that are recommended to be used with the badge depending on the specific circumstances. Neither use of one of these accompanying statements, nor any badge qualified by Mastercard for a specific card product shall make Mastercard responsible for your use of the badge mark or your compliance with Legal Requirements.

Examples of accompanying disclosures that may help contextualize the badge mark include, as the case may be:

- This card is made with xx% recycled plastic.
- This card is made with xx% bio-sourced plastic.
- This card is made with xx% Ocean recovered plastic.
- This card is Halogen free.

Card issuers are responsible for ensuring that any text or messaging on the card itself or supporting marketing material is accurate, factual, not misleading, and compliant with Legal Requirements. Mastercard is not liable for your use of the badge or any accompanying claims or text that you may present or fail to make adequately or appropriately.

END OF LIFE CONSIDERATIONS

Traditional end of life for payment cards involves cardholders being advised to cut the card into pieces and placing them into a domestic waste bin. Ultimately this waste is then either placed in landfill or incinerated. This does not need to be the case.

As mentioned in previous sections, incineration of cards can create toxic gases, depending on the material they are made from. It is also a good question as to whether incineration, even for energy harvesting, is the best use of these precious raw materials.

Similarly with landfill, there is no positive aspect through this disposal method, yet it is the default outcome. Creating cards from more sustainable materials and in a more sustainable way is a vital first step, but it remains a first step. In order to increase sustainability and limit the environmental impact as fully as possible, alternative end of life solutions should be implemented.

Generally speaking, there are two main alternatives: Composting or recycling. Composting is a complex matter and the very nature of it as a process can lead to confusion and misunderstanding.

No payment cards have been shown to compost in the natural environment. If a card is placed in a garden compost bin and left it will not degrade any quicker or further than if it is thrown on the side of the road as litter.

Certain materials will degrade under very specific and managed conditions, known as industrial composting. Again, as previously mentioned, cards that are made from mixed polymers such as PLA with PVC overlays will not degrade in the same way, so this end-of-life pathway is only an option for very specific products. For industrial composting to be an option the correct card material must be chosen and a program to collect and transport the waste cards to the industrial composter must be enabled. Other factors which must also be considered are what to do with the non-compostable contaminants such as the chip or magnetic tape, what will happen to the compost at the end of the process etc. This is not to say industrial composting cannot be a solution, just to highlight that what may seem an obvious and clean process/message can be surprisingly complex.

Ultimately, if a solution is found, this does not alter the need to create more new plastic. Recycling aims to divert waste away from landfill through reprocessing the material into a new product. This may include reprocessing into the same application (circular economy), higher value products of lower volume (upcycling) or reprocessing into a lower value product (downcycling). During reprocessing, the main difference between recycling and composting – apart from the obvious technical processes is that the aim of recycling is to create new products and reduce the need to create new virgin plastic, whereas composting's aim is to better dispose of waste.

Issues faced by composting programs are also faced by recycling programs. Consumers cannot simply put their expired cards into their domestic recycling bin for collections and recycling, they will be rejected. A dedicated and specific collection and recycling stream must be created and implemented to make this a viable solution.

Not all plastics are readily recycled some such as PETG or HDPE are more commonly recycled than PVC or PLA. Similarly, if a card is made from mixed polymers, it will make recycling more complex. Any issuer planning to implement a recycling program should choose their card material and construct with this in mind.

Plastics recycling is an area of key focus and growth, cross industry. The emergence of new chemical recycling techniques alongside the traditional mechanical processes makes this an emerging option for cards which will likely see further enhancements and improvement over the coming years. Issuers can choose products today, made from suitable materials, even if they do not yet have the program in place to collect and recycle the cards.

Contaminants such as chips or magnetic tape are still problems, as they are with composting, that need to be addressed. Recycling processes do allow for the separation and removal of these elements, or, in some downcycling scenarios, they may be left and ground to a state where they are no longer an issue.

Mastercard has invested in academic research regarding chemical recycling of plastics. This work is ongoing and there is a promising opportunity that chemical recycling of plastic cards could well be the best step forward towards creating a more circular economy.



ABOUT THE GPP

The Greener Payments Partnership (GPP) is an advisory council comprised of members drawn from card manufacturers who supply Mastercard products to issuers, and that have expertise in card production, card recycling, and have researched and developed - new card manufacturing materials that support the reduction in first use PVC. It was formed to have an open dialogue among participants on environmental issues relating to card manufacturing, particularly as it relates to improvements in card production methods and materials that may contribute to sustainability and the environment.

To help support consumers meeting their environmental goals, the overarching goal of the GPP is to work collectively to identify and promote non-mandatory technical and business best practices aimed at reducing the footprint of first-use PVC material within the next five years in card manufacturing. These best practices may lead to opportunities to test a variety of environmentally friendly solutions that have the potential to establish a foundation for migrating the industry to a more sustainable card production ecosystem.

Current members of the GPP are:

Mastercard is a global technology company in the payments industry. Our mission is to connect and power an inclusive, digital economy that benefits everyone, everywhere by making transactions safe, simple, smart, and accessible. Using secure data and networks, partnerships and passion, our innovations and solutions help individuals, financial institutions, governments, and businesses realize their greatest potential. Our decency quotient, or DQ, drives our culture and everything we do inside and outside of our company. With connections across more than 210 countries and territories, we are building a sustainable world that unlocks priceless possibilities for all.

CPI Card Group® is a payment technology company and leading provider of credit, debit and prepaid solutions delivered physically, digitally and on-demand. CPI® helps our customers foster connections and build their brands through innovative and reliable solutions, including financial payment cards, personalization, and Software-as-a-Service (SaaS) instant issuance. CPI has more than 20 years of experience in the payments market and is a trusted partner to financial institutions and payments services providers. Serving customers from locations throughout the United States, CPI has a large network of high security facilities, each of which is registered as PCI compliant by one or more of the payment brands: Visa, Mastercard®, American Express® and Discover®.

Learn more at www.cpicardgroup.com.

Giesecke+Devrient (G+D) is a global security technology group headquartered in Munich. As a trusted partner to customers with the highest demands, G+D secures the essential values of the world with its solutions.

The company develops technology with passion and precision in four major playing fields: payment, connectivity, identities, and digital infrastructures. G+D

was founded in 1852. In the fiscal year 2021, the company generated a turnover of 2.38 billion euros with around 11,800 employees. G+D is represented by 81 subsidiaries and joint ventures in 33 countries.

Further information: www.gi-de.com

IDEMIA, as the leader in identity technologies, IDEMIA is on a mission to unlock the world and make it safer. Backed by cutting-edge R&D, IDEMIA provides unique technologies, underpinned by long-standing expertise in biometrics, cryptography, data analytics, systems and smart devices.

IDEMIA offers its public and private customers payment, connectivity, access control, travel, identity and public security solutions. Every day, around the world, IDEMIA secures billions of interactions in the physical and digital worlds.

With nearly 15,000 employees, IDEMIA is trusted by over 600 governmental organizations and more than 2,300 enterprises spread over 180 countries, with an impactful, ethical and socially responsible approach.

For more information, visit www.idemia.com or follow @IdemiaGroup on Twitter.

LINXENS is the global leader for the design and manufacturing of micro-connectors, modules, and RFID-antennas for smart-cards. LINXENS components are used in the banking, government, transit, access-control, telecom as well as healthcare market. With over 3000 employees and 5 production sites in Europe and Asia LINXENS serves the global smart card industry. LINXENS headquarter is in Paris, France. LINXENS is highly committed to the development of environmentally friendly products as well as production processes.

THALES (Euronext Paris: HO) is a global technology leader shaping the world of tomorrow today. The Group provides solutions, services, and products to customers in the aeronautics, space, transport, digital identity, and security markets. With 83,000 employees in 68 countries.

Toppan Gravity is a global solutions provider primarily focused on the payment and Identity industries, Toppan Gravity aims at developing the next generation of virtual and physical security documents. With the vision of becoming the forerunner in the secure ID and payment industry, the company focuses on driving synergies within the Toppan Group, through strategic acquisitions. Toppan Gravity empowers promising companies having state-of-the-art technology or businesses in emerging markets, including Asia, Africa, and Latin America to enhance their overall performance. Furthermore, the company enables its acquisitions to take advantage of the opportunities presented by its large, diversified group having numerous resources and extensive know-how.

For more information, visit www.toppangravity.com or contact info@toppangravity.com.