Australian Payments Network

REDUCING THE ENVIRONMENTAL COST OF PAYMENTS

July 2024

"The pace and scale of what has been done so far, and current plans, are insufficient to tackle climate change... In this decade, accelerated action to adapt to climate change is essential... The choices made in the next few years will play a critical role in deciding our future and that of generations to come."

– Intergovernmental Panel on Climate Change March 2023 [1]

1 IPCC (2023), Urgent climate action can secure a liveable future for all, 20 March

BACKGROUND

On the world's current trajectory, greenhouse gas emissions will peak in the next few years and, by 2030, fall to around 2% below 2019 levels.[2] Unfortunately, this is nowhere near enough. To limit temperature rises to the critical threshold of 1.5°C and avoid the worst impacts of climate change, a 43% reduction in global emissions is required by 2030.

Every country, industry, business and individual has a role to play in addressing the growing climate crisis. This includes the payments industry. While the environmental impact of a single payment might be considered negligible, with billions of transactions around the world each day, the overall impact of the global payments ecosystem would be far from zero.

It has been encouraging to see an increasing number of payment service providers (PSPs) globally taking steps towards greater environmental sustainability. However, more work needs to be done to better understand the environmental impact of payments and how we can make meaningful changes to improve this. Given its role in the global economy, the payments industry also has a unique opportunity to drive more sustainable behaviour across society more broadly, particularly among consumers and small businesses.

This paper provides some initial insights into the environmental impact of payments, and the role that PSPs can play in driving greater sustainability both within and outside the payments ecosystem.

2 United Nations Framework Convention on Climate Change (2023), New Analysis of National Climate Plans: Insufficient Progress Made, COP28 Must Set Stage for Immediate Action, 14 November.

WITH BILLIONS OF PAYMENTS MADE AROUND THE WORLD EACH DAY, THE GLOBAL PAYMENTS ECOSYSTEM IS LIKELY TO HAVE A SUBSTANTIAL ENVIRONMENTAL IMPACT

THE ENVIRONMENTAL IMPACT OF PAYMENTS

All payment methods have an environmental cost associated with them. And while the impact of each individual transaction may be small, the vast number of payments made globally each day would see this impact add up to a far more significant level.

Unfortunately, the complexity of payments makes it difficult to accurately measure the overall environmental impact of the industry or any given payment method. Differences in local payment preferences and environmental factors (such as the carbon footprint of a country's energy and transport sectors) also need to be considered when extrapolating any findings across countries. With this in mind, this section highlights some of the key insights gained from the available research on this topic to date.

CASH PAYMENTS

Cash is one of the least sustainable payment methods. Studies conducted by the Central Bank of Netherlands (DNB) indicated that the environmental impact of cash payments was about 36% higher than that of card payments in 2015.[3] A more recent study by Worldline in Belgium found that the carbon emissions from an in-store cash transaction could be up to 15 times higher than those from a digital payment, once a customer's travel to and from an ATM is taken into account.[4]

The banknote lifecycle includes the production of raw materials, printing, storage, distribution, use, and end-of-life treatment. Excluding customer travel, the studies cited above show that most of the environmental impact of cash is generated by the energy use of ATMs and cash-in-transit services.

The significant decline in demand for cash – and therefore ATMs – over the past few years suggests that the overall environmental footprint of cash should be declining. However, ensuring ongoing access to cash for all Australians means there may be limited scope to further reduce the number of ATMs or cash transportation requirements. Given the vast geographical expanse of Australia, the environmental impact of the national ATM fleet and cash-in-transit services could therefore remain significant (subject to the decarbonisation efforts of those technology and service providers).

It should also be noted that the change in the environmental impact on a per-transaction basis is less certain. Along with the decline in the number of ATMs over the past decade, the average number of withdrawals per ATM has also fallen – so while there are fewer ATMs using energy and material resources, the environmental cost of each remaining ATM is being spread over a smaller number of withdrawals.[5]

3 Hanegraaf, Jonker, Mandley and Miedema (2018), Life cycle assessment of cash payments, DNB Working Paper No.610, October.
4 Geoffron (2023), Accelerating the decarbonisation of payments, Worldline Report.
5 AusPayNet Device Statistics, RBA Statistical Table C4.1 (accessed 19 June 2024).

CARD PAYMENTS

For card payments, a study by Worldline found that the physical card accounted for around 60% of the total environmental impact of an in-person card payment in Belgium in 2022; point-of-sale (POS) terminals accounted for around 35%, and data processing activities for just 6%.[6] This contrasts with a study conducted by the DNB in 2015, in which POS terminals generated almost 75% of the environmental impact of a card transaction, while the physical card accounted for a little under 15%, and data centres for around 11%.[7]

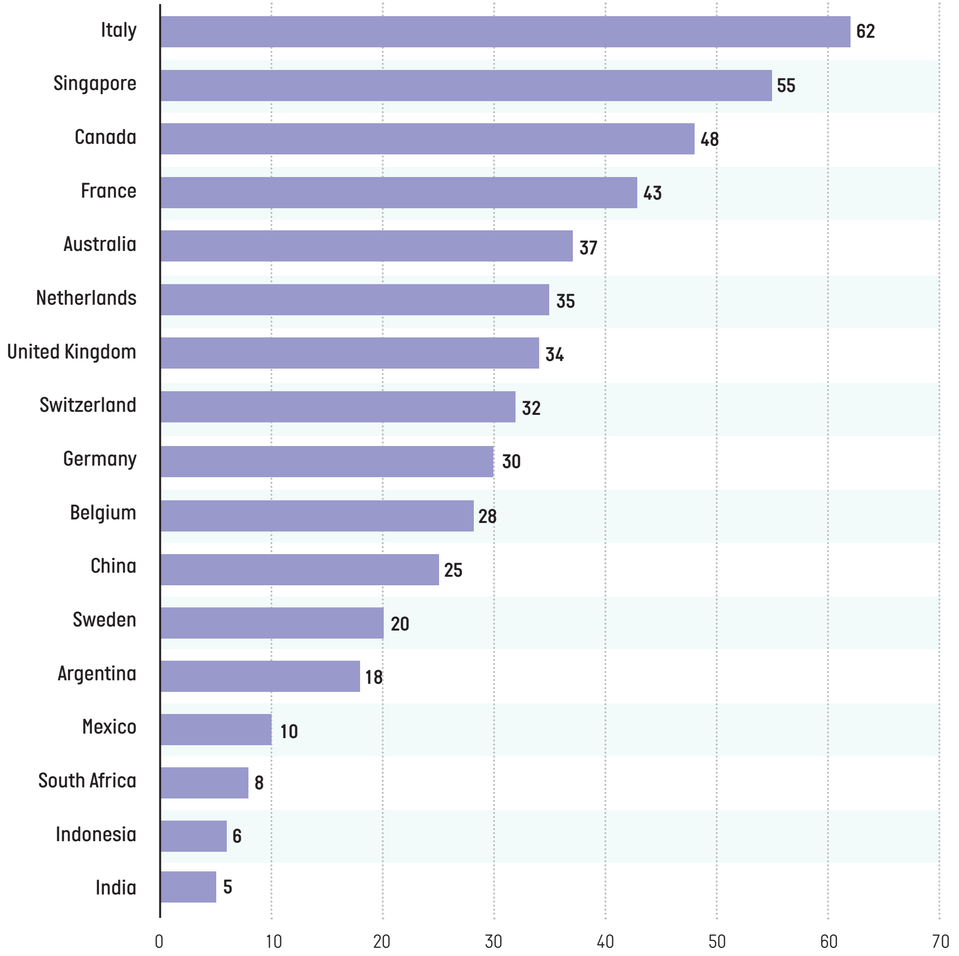
The differences could be partly due to country-specific factors. For example, Bank for International Settlements (BIS) data show that each Belgian had 5.8 payment cards on average in 2022, compared to less than 2 cards on average for each Dutch resident at the time of the DNB study in 2015.[8] The differences could also partly reflect the shifts in consumer payment preferences over the past decade – as the share of payments made using card increased, the largely fixed environmental impact of POS terminals and data centres would have been spread across a greater number of transactions. The BIS data show that the average number of cards per person also increased in many countries during that time. Regardless, both studies highlight that the vast majority of the environmental impact of card payments is generated by the physical components.

As with cash, the ecological footprint of a **POS device** stems not only from the use of raw materials and the manufacturing process, but also its transportation, energy consumption, maintenance and end-of-life processing. POS devices can be made from around 50 different types of metal, alongside plastic and other components.[9] While some of these components can be recycled, this must be done through specialist e-waste facilities; there is no information available on how often this happens in practice in Australia at this point in time. Australia also has among the

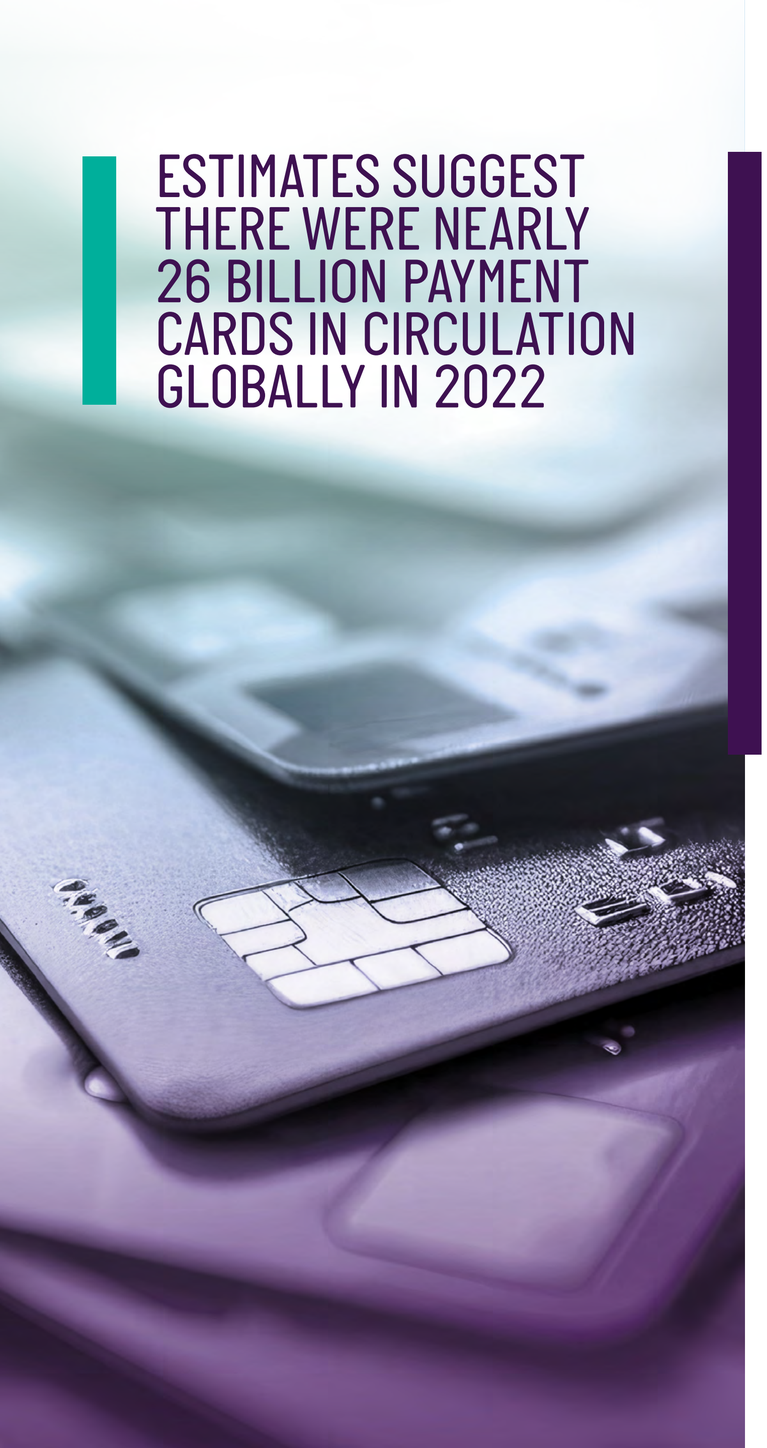
6 Geoffron (2023), Accelerating the decarbonisation of payments, Worldline Report.
7 Lindgreen, van Schendel, Jonker, Kloek, de Graff and Davidson (2017), Evaluating the environmental impact of debit card payments, DNB Working Paper No.574, October
8 BIS Statistics: Retail payments, currency and related indicators: Table CT13B – Number of cards per inhabitant (accessed 19 June 2024).
9 European Payments Council (2023), Green payments: sustainability by design for a more viable future, 28 February.

POS TERMINALS: CROSS-COUNTRY COMPARISON

POS terminals per 1,000 residents



Source: BIS Statistics - Retail payments, currency and related indicators



ESTIMATES SUGGEST THERE WERE NEARLY 26 BILLION PAYMENT CARDS IN CIRCULATION GLOBALLY IN 2022

highest penetrations of POS devices globally, with over 1 million active terminals in March 2024.[10]

While **payment cards** are much smaller and simpler than POS terminals, similar problems arise. Most cards are primarily made from first-use synthetic plastic (PVC), which is neither biodegradable, nor easily recyclable. As the use of cash has declined globally, the demand for payment cards has increased significantly over the past decade. Estimates suggest there were nearly 26 billion payment cards in circulation globally in 2022, with over 3 billion new cards produced each year.[11] With each card containing about 5 grams of plastic, this equates to over 15,000 tonnes of new plastic each year – the weight of around 90 Boeing 747s. One analysis indicated that the carbon footprint of this annual production is equivalent to almost 300,000 passengers flying from New York to Sydney.[12] Furthermore, the manufacture of PVC releases toxic pollutants into the environment, and most cards end up in landfill at the end of their three-year average lifespan.

Payments-related data processing has been assessed to be the smallest contributor to the environmental impact of card transactions. Despite the rapid growth of digital payments over the past few years – and the quantity of information transmitted alongside them – data centres and processing activities are more likely to benefit from significant economies of scale in terms of material resource use, energy requirements and carbon emissions. At the same time, the increasing number of participants in the payments value chain – with each PSP requiring their own technology stacks – could have an additive impact on the overall environmental footprint of the industry over time. This applies to all forms of digital payments, including real-time payments (for which there has been particularly little information on sustainability available to date).

Finally, the **receipts** printed alongside most in-person payment transactions should also be considered. According to one analysis in 2019, paper receipts printed in the US consume more than 3 million trees, 34 billion litres of water, and generate carbon emissions equivalent to those of 450,000 cars.[13] Furthermore, the Bisphenol A (BPA) and Bisphenol S (BPS) used in receipt paper poses significant health risks for both customers and business employees, while also making receipts non-recyclable.

10 AusPayNet Device Statistics (accessed 19 June 2024).
11 Nilson Report (2023), Payment Cards Projected Worldwide, Issue 1234, January; Mastercard (2023), A Guide to Issuing Sustainable Cards, Greener Payments Partnership Whitepaper, January.
12 Thales (2023), The life cycle of an eco-friendly bank card: supporting your sustainable practices.
13 Climate Action (2019), Skip the Slip – Environmental Costs & Human Health Risks of Paper Receipts, 5 August.

DRIVING SUSTAINABILITY IN PAYMENTS

The discussion above indicates that there are significant opportunities for the payments industry to embrace more environmentally sustainable practices. Indeed, a growing number of PSPs have already begun undertaking various initiatives in response to the climate challenge.

At the most basic level, each PSP can take actions to reduce its own environmental footprint. This includes increasing the energy efficiency of its operations, reducing waste and transitioning to renewable energy sources. Visa, for example, has announced that it has already achieved carbon neutrality across its global operations since 2020 through energy efficiency initiatives, a transition to renewable electricity and use of carbon offsets to cover any residual emissions. Many banks and fintechs in Australia are pursuing similar goals of achieving carbon neutrality of their operations, in line with the Australian Government's commitment to transitioning to net zero by 2050.

Suppliers of physical payments technology can play an important role in reducing the broader industry's environmental footprint through the design and development of more eco-friendly devices. The DNB research indicated that the environmental impact of the entire debit card payment system could be almost halved by using renewable energy in payment terminals and data centres, reducing the standby time of payment terminals and increasing the lifetimes of payment cards. One of the PSPs taking action in this space is Ingenico, which has been working on increasing the sustainability of POS terminals at every stage of the product's lifecycle.

THERE ARE SIGNIFICANT OPPORTUNITIES FOR THE PAYMENTS INDUSTRY TO EMBRACE MORE ENVIRONMENTALLY SUSTAINABLE PRACTICES

This has included reducing raw material use, eliminating toxic substances, reducing the carbon footprint of its logistics processes, increasing the terminals' energy efficiency, and implementing refurbishment and recycling programs.[14] Similar initiatives could also be considered for ATM fleets.

The use of recycled, recyclable or bio-sourced materials by card issuers can also make a significant difference. One estimate suggests that switching from PVC to a recycled-plastic equivalent material can reduce a card's carbon emissions by up to 75%.[15] Encouragingly, the development and issuance of more sustainable payment cards has been increasing over the past few years. Some of the available options now include cards made from renewable bio-sourced resources such as corn, recycled ocean plastic and recycled PVC. Mastercard – which has been running a sustainable card program for a number of years – recently announced that all newly issued Mastercard cards globally will need to be made from sustainable materials by the end of 2028. Giesecke + Devrient, which manufactures over 500 million cards annually, has also committed to remove all first-use plastic from its payment cards by 2030.[16]

In Australia, the rapid uptake of mobile payments should also prompt issuers to consider whether physical cards should be made available by default, or whether a 'digital first' approach could be adopted instead. Customers of the Australian digital bank Up, for example, need to manually opt-in and pay a small fee to receive a physical card, encouraging greater consideration of whether a physical card is required.

Similarly, acquirers that provide mobile-based payment acceptance solutions for businesses could help significantly reduce the number of traditional POS devices required. While mobile phones can also generate a significant environmental footprint and are likely to have a shorter lifespan than POS terminals, it is unlikely that a merchant would purchase a phone for the sole purpose of payments acceptance; the *marginal* environmental impact of a card transaction made at a store where the business owner uses their existing mobile device to accept payments is therefore likely to be significantly lower than at a store using dedicated POS terminals.

Digital receipt solutions are also evolving, with entities like Woolworths and Slyp allowing POS data to be captured directly within a customer's shopping or banking app, or sent to their mobile phone. Recently conducted research showed that replacing the 10.6 billion paper receipts printed in Australia each year with digital receipts could reduce the associated carbon emissions from around 96,000 tonnes to just 3,000 tonnes.[17]

14 Ingenico (2021), Eco-designing payment terminals: a fundamental pillar of your CSR strategy, 30 June.
15 Fitzgerald (2022), *6 ways payment cards are getting greener*, American Banker, 24 October.
16 Giesecke + Devrient (2022), G+D pledges to end the use of virgin plastic in payment cards by 2030, 20 July.
17 Slyp (2023), Australian industry unites to reimagine the future of receipts in Australia, 23 November.

PAYMENTS DRIVING SUSTAINABILITY

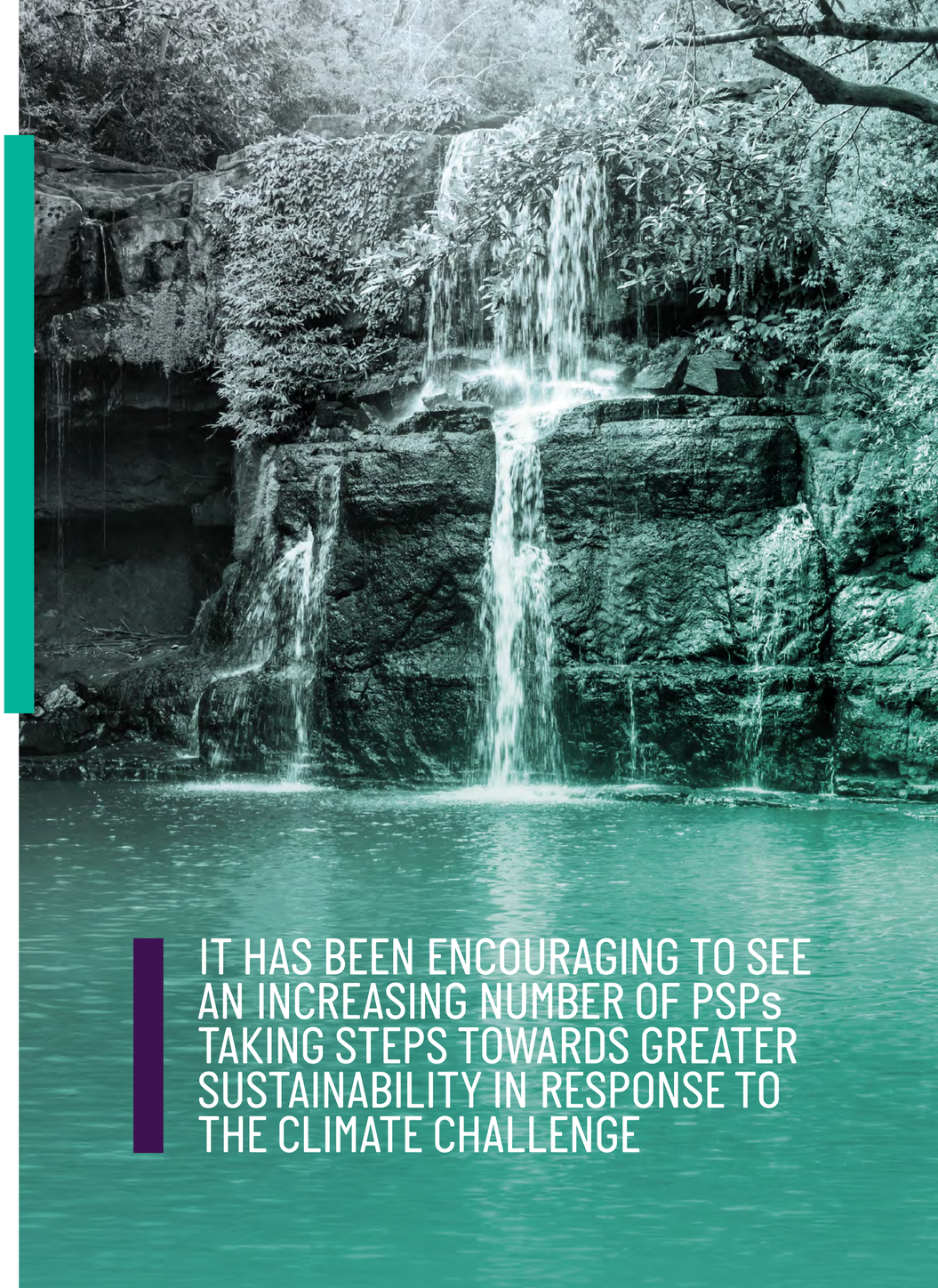
The critical role of payments in the global economy gives PSPs a unique opportunity to drive sustainability not just throughout the payments value chain, but also across the economy and society more broadly.

Reaching global sustainability targets will require a collaborative effort across all governments, businesses and individuals. Consumers are becoming increasingly willing to take personal action to address environmental challenges, including through more eco-conscious consumption. However, most consumers and businesses do not currently have the knowledge or resources to understand and address their environmental footprints.

This is where the payments industry could play an important role, since much of the economic activity of consumers and businesses can be captured through digital transaction data. By integrating a measure of the environmental impact generated by the activity underlying a payment, it would be possible to provide consumers and businesses with a near-real-time view of the environmental impact of their consumption habits and operations. This, in turn, could help them make more informed decisions and adopt more sustainable practices.

Examples of such tools are already available. For example, Mastercard recently collaborated with Swedish fintech Doconomy to develop a carbon calculator that can show consumers the carbon footprint of each transaction. The tool can also be used to provide consumers with relevant and timely advice on reducing their personal environmental impact, and options to offset the carbon footprint of a transactions at the point of sale.

The potential impact of such information is significant. Across the OECD countries, for example, SMEs account for at least 50% of the business sector's greenhouse gas emissions. However, only around 10% of these SMEs measure their carbon footprint.[18]
PSPs can help address this gap by integrating sustainability metrics into their payment platforms, enabling merchants to track their carbon emissions and identify areas for improvement.



IT HAS BEEN ENCOURAGING TO SEE AN INCREASING NUMBER OF PSPs TAKING STEPS TOWARDS GREATER SUSTAINABILITY IN RESPONSE TO THE CLIMATE CHALLENGE

18 OECD (2023), Sustainable SMEs, 15 February.

Integrating sustainability metrics into digital transaction data across the economy could also generate macro-level insights that enable better policy interventions. Such data could help governments and other policy makers identify the most effective initiatives across different sectors and activities, and track the impact of policies over time.

INDUSTRY COLLABORATION

The growing complexity and interconnectedness of the payments ecosystem means that a collaborative industry approach may be required to make payments truly greener.

The progress already being made by PSPs on making payments more sustainable is to be commended. However, most entities remain focused on their own carbon footprint, with little insight into the environmental impact of the overall payments value chain. Issuing payment cards made from eco-friendly materials, for example, could give customers a false sense of the sustainability of their payment choices, if the benefits of the physical card are more than offset by the negative environmental impact of the POS terminals and data centres facilitating each of their card transactions.

With each payment relying on multiple service providers, a more systematic and collaborative approach to understanding and addressing the environmental footprint of different payments processes and technologies may therefore be required to drive meaningful change. As a starting point, members should seek to share their insights and assist other participants in the value chain to adopt more sustainable practices. One example of this is Mastercard's sustainable card program, which shares information on sustainable card materials and where to source them.

AusPayNet will continue to seek opportunities to facilitate the exchange of information and share insights with its members on environmental sustainability matters. AusPayNet will also stand ready to assist the industry in coordinating the development of any joint initiatives that seek to improve the sustainability of the payments systems and technologies in Australia, for the benefit of all Australians and the future of our planet.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