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Plastic Credits

Exploring Plastic Credit Schemes: Scope, risks and uncertainties

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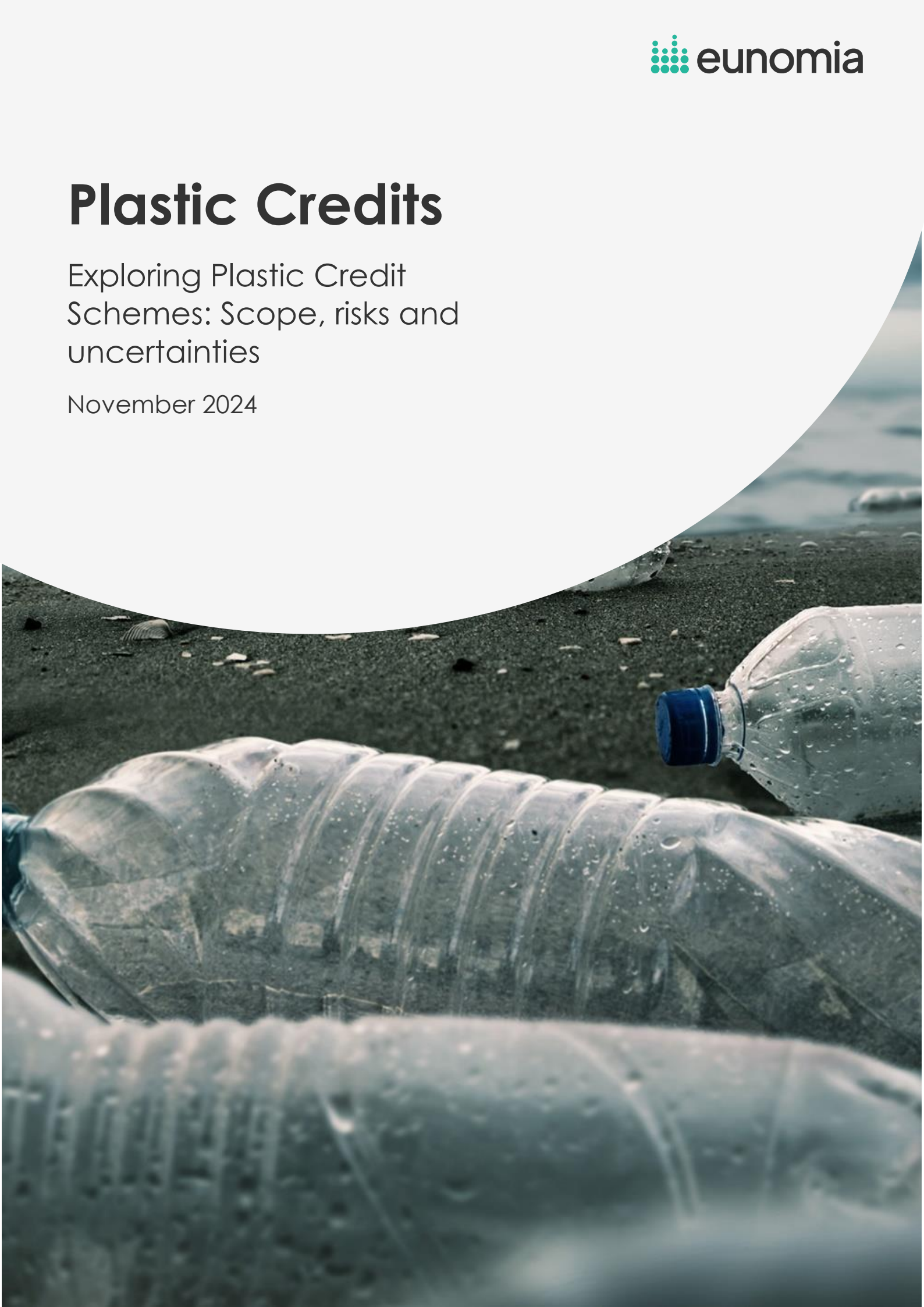

Report For

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Executive Summary

Introduction

Recent years have seen the emergence of 'plastic credit' schemes. A plastic credit is issued to the developer of a plastic waste collection, recycling and/or recovery project, usually in the form of a certificate representing a specific weight of waste plastic collected, recycled or otherwise managed. This credit can then be sold, either to the voluntary market or as a means (in a small number of countries) of demonstrating regulatory compliance.

Plastic credits have been gaining prominence in discussions relating to the United Nations Plastics Treaty as "innovative instruments" to channel funding towards tackling global plastic pollution. Proponents of plastic credits highlight their potential to fund the collection and recovery of plastic waste in countries without sufficient waste management infrastructure, with credits seen as a convenient way to connect suppliers of projects (project developers), who incur costs, with potential buyers who wish, either voluntarily or because they are mandated to in legislation, to contribute financially towards these operations.

Recognising the need to investigate the emerging market of plastic credits further, Fauna & Flora commissioned Eunomia Research & Consulting to undertake analysis of plastic credit schemes, and present findings and recommendations.

Areas of Concern

A number of issues with plastic credits and plastic credit schemes were identified in the study.

In the voluntary market, a challenge faced by a number of schemes relates to the question of additionality, whereby, for example, credits are being presented as only being issued to project developers for activities that go beyond 'business as usual', and that the activity wouldn't have occurred without the incentive offered by the credit.

However, our analysis shows that many projects have been up and running long before they are issued credits, and the lack of a guaranteed purchase means credits issued may never be sold. Furthermore, the sale price of the credit (if sold) does not necessarily relate to the cost of collecting, recycling or otherwise managing the waste plastic. Thus, there is a lack of a direct link between the purchase of a credit and the amount of plastic waste collected and or managed.

Terminology used by some (but not all) credit schemes, such as 'plastic offsets' and plastic neutrality', also creates the potential for consumers to be misled if the purchasing companies then use these labels to promote their products. Even if all costs of the underlying collection and management activities were covered (which is not the case under plastic credits where the price of credits depends on the balance of supply of and demand for those credits) and 100% of plastic waste were collected and appropriately managed, there would still be environmental impacts from production and end of life management. Use of words such as offsetting, or neutrality, however, conveys the impression that impacts are, indeed, fully offset, or 'neutralised', which is not the case.

The study also found a reluctance from many corporations to engage with voluntary credit markets, thereby indicating a potential lack of demand for credits. Nestlé, Coca Cola and Unilever, for example, have all announced they do not believe in using plastic credits, and instead advocate for well-designed EPR systems.

Differences between EPR based on cost recovery and credits

There are key differences between well-designed EPR systems and credits. EPR is a centrally managed system that, if designed and implemented well, can provide a co-ordinating role as waste collection and

management is scaled up. Credits, however, cannot do the same – credit schemes channel funding towards collection and recovery projects on an individual basis, as opposed to providing funding in a systematic way across waste management, which EPR can be designed to do.

Cost recovery is the guiding principle of EPR but not of credits. Well-designed EPR systems cover the costs of waste management and have performance standards in place to improve waste management over time. EPR fees are charged to producers, depending on how much packaging, and of which type, they place on the market, in order to cover these costs. EPR is therefore guided by the polluter pays principle (PPP). Moreover, an EPR scheme where costs are covered and that control the collected material, can make for a reliable counterparty for investors in facilities. By contrast, credits do not provide such assurance for investors.

While EPR may seem a challenging form of regulation for some countries to implement, the key element initially is to establish a form of cost recovery from producers. This might take the form of a levy on producers, or some other simplified means of cost recovery in the first instance, but should always be guided by the key principle that costs should be covered by producers.

Recommendations

The establishment of cost recovery through EPR should be a key focus of the UN Plastics Treaty, not the expansion of credit mechanisms.

However, credit schemes are already in place, in both the voluntary market and for EPR compliance. It is therefore recommended that countries that have already established a plastic credit mechanism as a means of EPR compliance in their legislation, such as the Philippines, Brazil and India, should consider how the transition could be made to full cost recovery through EPR.

Those that have mandatory EPR in place already, and have not yet established a plastic credit mechanism as a means of EPR compliance in their legislation, should not introduce mandatory credits into their EPR legislation. Voluntary plastic credits should only be used to contribute funds towards activities that are beyond the scope of EPR.

Potential buyers who are considering purchasing credits should instead join an EPR scheme if there is a mandatory EPR scheme in the country in question. If this is not an option, buyers should join a voluntary EPR scheme (if it exists) while also advocating for mandatory EPR. If there is no EPR option available, then buyers should seek to either directly fund projects or buy credits from projects and schemes for which they have undertaken appropriate due diligence.

To the extent possible purchasers should seek to ensure the following:

- Credits should be purchased from a geographical location in which collection is not currently taking place, and from projects that tackle the types of plastic producers are responsible for;
- Credit purchases should provide sustained funding throughout the lifetime of a project, rather than be one-off purchases;
- Buyers should monitor closely how the projects being funded are performing on both social and environmental metrics; and
- The terms “plastic offsetting” and achieving “plastic neutrality” should be avoided, as these are terms that are highly likely to mislead consumers.

Table of Contents

List of Tables and Figures

Tables

Figures

Acknowledgements

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Philippine Alliance for Recycling and Materials Sustainability (PARMS)

SourceMaterial

Tearfund

TONTOTON

UC Berkeley

Verra

1.0 Introduction

Recent years have seen the emergence of 'plastic credit' schemes. According to The Circulate Initiative, in 2020 there were as many as 32 of these schemes in operation globally, some of which offer to 'offset' a company's 'plastic footprint' or enable the achievement of 'plastic neutrality'. [1] Other plastic credit schemes expressly state that the purchase of their credits is not intended as an 'offsetting' tool, but rather a way in which companies can channel funding into the informal waste sector, which accounts for approximately 59% of all the plastic material collected for recycling.[2]

While they typically operate in the voluntary market, 'plastic credits' are also being used as a means of complying with, regulatory requirements such as the approaches currently taken to Extended Producer Responsibility (EPR), in countries such as India, Brazil and the Philippines. Meanwhile, a recent report from the UN Plastics Treaty's Expert Group 1 on financial mechanisms mentions 'plastic credits' several times, referring to them as "innovative instruments" that are "adopted by financial institutions" to "incentivise companies to shift towards sustainable practices", and states they are "results-based financial tool(s)". [3] Additionally, plastic crediting organisations such as Verra and PCX Markets have advocated for the use of plastic credits within the treaty[4,5] and have attended INC negotiations and held side-events to discuss the potential role of plastic credits.[6,7]

With the growing prominence that credits are gaining as a proposed solution to the global plastics crisis, this report intends to provide an overview of plastic credit schemes around the world, both those that are used as a form of compliance with national EPR legislation as well as those that are part of the voluntary market, and outline some of their key features as well as risks and concerns to date.

The report is set out as follows:

- Section 2.0 gives a brief overview of plastic credits and what they are being used for, and introduces the key concepts and terminology associated with them.
- Section 3.0 describes and analyses how plastic credits work in practice, including an overview of four prominent plastic credit schemes and the markets selling credits.
- Section 4.0 provides an exploration of the key risks and areas of concern with plastic credits, including greenwashing and reputational risks, poor functioning of the market, and social and environmental impacts.
- Section 5.0 considers the key differences between plastic credit schemes and EPR schemes.

[1] The Circulate Initiative (2021) A Sea of Plastics Claims and Credits: Steering Stakeholders Towards Impact. Available at: Link

[2] UNDP (2023) Unsung heroes: Four things policymakers can do to empower informal waste workers. Available at: Link

[3] UNEP (2024) Ad hoc intersessional open-ended expert group to develop an analysis of potential sources, and means that could be mobilised, for implementation of the objectives of the instrument, including options for the establishment of a financial mechanism, alignment of financial flows, and catalysing finance, for the consideration by the committee at its fifth session. Available at: Link

[4] Verra (2023) The Role of Plastic Credit Finance in the Global Plastic Treaty. Available at: Link

[5] PCX Markets (2023) PCX's Contribution to the Global Treaty on Plastic Pollution. Available at: Link

[6] Verra (2024) Verra at Fourth Session of Global Plastic Treaty Negotiations (INC-4). Available at: Link

[7] Business World (2023) PCX to join global policy meeting. Available at: Link

- Section 6.0 concludes by summarising the findings and outlining the key recommendations for policymakers, potential buyers of plastic credits, and credit schemes themselves.

The findings of this study are based on reviews of grey literature, including websites and publicly available databases of organisations involved in running and participating in plastic credit schemes, company reports and papers published by non-governmental organisations (NGOs). Interviews were also conducted with organisations running plastic credit schemes, organisations developing projects, individuals and organisations with an interest in plastic credits, and waste picker associations. A full list of stakeholders engaged (where disclosure has been permitted) is available in 0. It must be noted that, due to sensitivities and perceived risks, the report does not attribute comments to specific individuals or organisations.

2.0 What are plastic credits?

This section begins with an overview of what plastic credits are, the key concepts and terminology surrounding them, and explains the distinction between voluntary schemes and situations where plastic credits can be used as a means of demonstrating compliance with a regulatory requirement.

2.1 What are plastic credits and how are they meant to work?

Plastic credits have emerged as a new mechanism intended to channel funds towards projects that are collecting and managing plastic waste, particularly in low- and middle-income countries. A plastic credit is issued to the developer of a plastic waste collection, recycling and/or recovery project, usually in the form of a certificate representing a specific weight (normally 1 tonne) of plastic waste collected or recycled, which would have otherwise ended up, variously, uncollected, mismanaged, or in a landfill. This credit can then be sold in the open market, and in some cases credits are marketed in ways that suggest that companies can, through purchasing credits, use them to 'offset' their plastic pollution impact. Together, the issuance of a credit to a project, and then its potential onwards sale to a buyer, forms the basis of a plastic credit scheme. Upstream activities, such as the reduction of plastic production, are not eligible for credits under existing plastic credit standards, nor is the reuse of plastic waste.

The PREVENT Waste Alliance Group states that the emergence of credit schemes in recent years: [8]

> *"highlights the potential of such systems to increase collection and recovery/recycling of plastic waste in countries without sufficient waste management infrastructure, while creating socio-economic co-benefits by improving income opportunities for waste workers."*

Plastic credits have been marketed by some schemes as an effective mechanism for channelling funds into the informal waste sector, which is active in combatting plastic pollution in regions where formal waste collection activities are lacking. For example, BVRio, a plastic credit scheme provider and project developer, states that it aims to "develop, hone and prove mechanisms for the delivery of plastic credits to low income waste pickers" through involving waste picker cooperatives in several of its plastic credit projects[9] (more detail on BVRio and the activities it undertakes is given in section 3.3.4 and in the Appendix A.2.4). However, similar approaches have not been observed across other schemes.

With the emergence of plastic credit schemes, suppliers of plastic collection and recovery projects (project developers) who incur costs, can be connected with potential buyers who wish (voluntarily or because they are mandated to in legislation) to contribute towards these costs through the purchase of credits. Project developers are free to set their own credit prices, but whether they are able to sell or not at that price depends on demand.

Trading of credits

[8] PREVENT Waste Alliance (2023) Discussion Paper: Plastic credit schemes and EPR – risks and opportunities. Available at: Link
[9] BVRio (n.d.) PREVENT Waste Alliance: Plastic Credits for inclusive and transparent circularity. Available at: Link

Once a credit has been issued and then purchased by a buyer, whether it can then be traded again or not depends on the credit scheme. In the BVRio Circular Credits Mechanism (outlined in section 3.3.4), for example, a credit can be purchased by one entity and then sold again (traded) to another entity, as long as it hasn't yet been retired. Once a credit is retired, however, it cannot be traded or sold anymore. In the PCX Solutions scheme (outlined in section 3.3.2), credits cannot be traded.

Plastic neutrality

Some plastic credit schemes, though not all, promote their credits to potential purchasers by stating that through purchasing (sufficient) credits the company can claim to have achieved 'plastic neutrality'. 'Plastic neutrality' is described by such schemes as being when a company has purchased enough plastic credits to 'offset' its entire plastic footprint for a set period of time. For example, the Ocean Bound Plastic Producers & Users Standard[10] allows companies to claim 'plastic neutrality' through the purchase of credits that equate to the total consumption/production of plastic by a company, or its brand, in one year. There is currently, however, no accepted harmonised method for determining the boundary of a company's plastic footprint, nor how it should be measured, and there is little transparency or disclosure from companies on this matter (this issue is outlined further in section 4.1.2). Similarly, there is no standardised measurement for quantifying how much plastic is collected and/or processed, or indeed what 'processed' means, making the process of calculating an offset more complex. Moon et al (2024)[11] recently published a paper which explores the complexities with measuring the impact of plastics on the environment given the huge variability in plastic composition and chemistry (this issue is explored further in section 4.1.2).

The following sections make the distinction between voluntary plastic credit schemes (section 2.2), and credits used as a means of demonstrating regulatory requirements (section 2.3).

2.2 Voluntary plastic credit schemes

Several plastic credit schemes have emerged over the last few years promising a source of funding for underfinanced waste management in parts of the world that need it the most. A number of organisations are now involved in the value chain of plastic credits, from the development of credit projects, auditing and verification of credits, and the purchase of credits (these are outlined in section 3.1).

Voluntary plastic credit schemes are often global in nature, meaning that companies from any country can purchase plastic credits generated in any other country, and for the management of any type of plastic. In voluntary schemes, there is no obligation imposed for the purchase of plastic credits, but companies, such as packaging companies and large consumer brands, may wish to do so. This could be for a number of reasons, which might include being able to claim they have 'offset' the polluting impact of their production activities, to improve their brand image, or simply as part of their corporate social responsibility (CSR).

As the global plastic pollution problem has become increasingly severe, and companies are under increasing pressure to act to reduce this problem, paying for credits that provide additional funding for collection, recycling or some other form of management of waste plastics in those countries most impacted by plastic pollution, provides one means of being able to demonstrate that action is being taken.

[10] Ocean Bound Plastic Certification (2021) OBP Plastic Producers & Users Standard. Available at: Link
[11] Moon, S. et al (2024) 'Unpacking plastic credits: Challenges to effective and just global plastics governance' Unpublished manuscript.

2.3 Credits as a means of demonstrating regulatory compliance

In contrast with voluntary credits, where companies are under no obligation to use them, there are a few countries where the purchase of plastic credits is a means of demonstrating regulatory compliance.

Three countries, namely the Philippines, Brazil and India, have opted to introduce EPR schemes for plastic packaging only, and for plastic credits to be a means of complying with the EPR legislation. In the Philippines and Brazil, plastic credits have been embedded in their EPR legislation as one of a number of possible methods for producers to provide evidence that they are meeting their obligations, whilst in India plastic credits are the *only* means by which producers can meet EPR requirements.[12,13]

The relevant laws in India and the Philippines were only implemented in 2022 and are still in the process of being rolled out, so the effectiveness of these policies is difficult to assess.

The Brazilian, Indian and Philippines compliance credit schemes are outlined in more detail in section 3.2.

[12] Grant Thornton Bharat (2023) Extended Producer Responsibility (EPR) for plastic waste. Available at Link
[13] WWF – Philippines (2024) A Study on the Role of Producer Responsibility Organizations. Available at Link

3.0 How plastic credit schemes work

This section outlines in more detail how plastic credits work, and is laid out as follows:

- Section 3.1 provides an overview of some of the organisations involved in the plastic credit scheme supply chain.
- Section 3.2 presents the examples of the Philippines and Brazil where credits are being used as one means of complying with national EPR legislation, and India, where credits are being used as the *only* means of complying with national EPR legislation.
- Section 3.3 provides an overview of several of the most prominent organisations currently issuing plastic credits and presents an insight into the state of the market today, including the number of credits issued to date by each organisation.
- Section 3.4 provides an overview of two of the market platforms through which buyers can purchase plastic credits.

3.1 Landscape overview

From the perspective of plastic credit scheme providers, plastic credit schemes have emerged in order to scale up infrastructure and technical capacity to tackle the flow of plastic pollution into nature. They have been designed as a mechanism to channel funds from the businesses responsible for producing and distributing plastic to regions where widespread waste collection and management do not exist. Accompanying schemes, plastic credit standards are a set of guidelines and methodologies under which plastic collection and recycling projects can be issued credits.

Plastic credits arguably have some similarities with the practice of plastic claims, through which organisations can make an environmental or social claim with regards to the plastic in their supply chains. For example, a company which has replaced its use of virgin plastic with plastic made from recycled materials may promote their company or product with the claim 'Made from recycled plastic'. Plastic claims are intended to provide an incentive for plastic producing companies to make more sustainable choices, by building trust with the consumer.

Plastic credits differ as schemes state that they are designed to provide a direct financial contribution from plastic packaging companies and consumer brands to projects collecting and/or recycling plastic. However, organisations involved in setting plastic claims standards are increasingly moving into plastic credits work, leading to potential conflicts of interest.[14] Consequently, the distinctions between the two are becoming less clear and the terminology used by organisations involved in setting and using these standards are progressively more contradictory. For example, some plastic credit schemes allow claims, such as 'plastic neutral', within their guidelines, whilst others discourage the use of plastic claims entirely. The claims used in relation to plastic credits have been defined in A.1.0.

Moreover, as there is no standardised approach to issuing and verifying credits, the plastic credits currently on the market may vary in scope, methodology and quality. The following flowchart (Figure 1Figure 1) attempts to simplify the value chain and types of organisations involved in plastic credits, although the terminology used in practice may differ between schemes. Figure 1 provides an overview of the types of organisations and actors involved in

[14] Conflicts of interest may arise where organisations setting plastic claims also set the standards around plastic credits due to issues with combining these two mechanisms (see section 4).

the value chain of plastic credits, whether on the supply-side or demand-side, acting as intermediaries in the market, or other.

Figure 1: Flow chart (value chain) of plastic credits

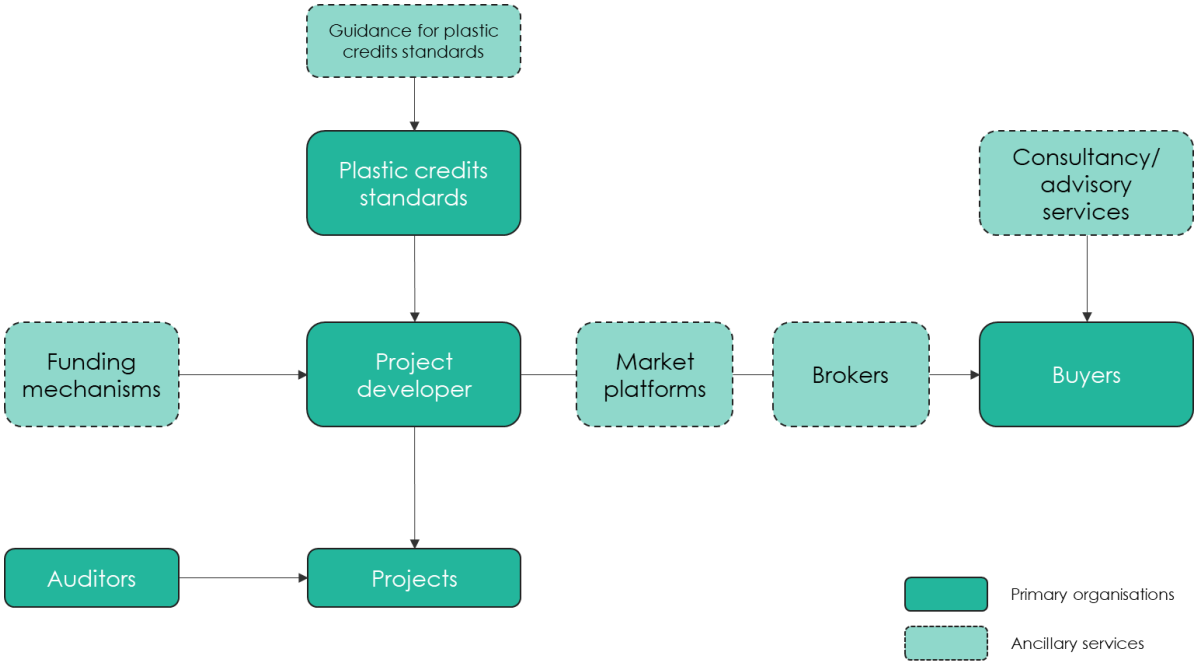


Table 1 below provides a list identified through this research of organisations involved in the supply chain of plastic credits, and what role they fulfil in the supply chain. This list is not intended to be exhaustive, as there are many more organisations involved than those listed below (in particular buyers, those providing funding, and consultancy/advisory services).

Table 1: Organisations involved in the supply chain of plastic credits

Organisation	Plastic credit standard provider	Project developer	Auditor	Buyer	Market platform	Funding mechanism	Consultancy/ advisory services
Verra	✓[a]						
PCX Solutions	✓[b]						
Zero Plastic Oceans	✓[c]						
BVRio	✓[d]	✓			✓[e]		
PARMS	✓				✓[f]		
TONTOTON		✓					
Seven Clean Seas		✓					
Danone		✓		✓			
Second Life		✓					
ASASE Foundation		✓					
South Pole		✓					
rePurpose Global		✓					
Green Worms		✓					
Plastics for Change		✓					
Control Union			✓				
TÜV SÜD			✓				
Carbon Check			✓				
GP-23 / GP-023-IMPACT Collective				✓			
Escape Travel				✓			

Organisation	Plastic credit standard provider	Project developer	Auditor	Buyer	Market platform	Funding mechanism	Consultancy/ advisory services
Vinventions				✓			
Bentley Motors				✓			
Reflexa				✓			
Prevent Waste Alliance	✓	✓		✓			
Alliance to End Plastic Waste				✓			
Ogyre - ENDLESS S.R.L. S.B.				✓			
PCX Markets				✓	✓		
NutriAsia				✓			
Century Pacific Food				✓			
Monde Nissin Corporation				✓			
Nestlé Philippines				✓			
Colgate-Palmolive Philippines				✓			
Alliance to End Plastic Waste				✓			
Coca-Cola Beverages Philippines				✓			
Mondelez Philippines				✓			
Oceanworks Plastic Marketplace					✓		
Clean Hub					✓		
3RI					✓		
World Bank						✓	
Plastic Collective						✓	✓

a: Plastic Waste Reduction Standard

b: Plastic Pollution Reduction Standard
c: Ocean Bound Plastics Neutrality Subprogram
d: Circular Credits Mechanism
e: Circular Action Hub
f: Zero Waste to Nature Program

3.2 Demonstrating compliance through the use of plastic credits

This section explores how plastic credits have been integrated into EPR schemes in the Philippines, India and Brazil.[15]

3.2.1 Philippines

The Philippines' Extended Producer Responsibility Act of 2022, which entered into law in August 2022, mandates large companies (brand owners, producers, importers) that produce plastic packaging and who own more than Php100 million (~£1.4 million) in assets (excluding land assets) to comply with EPR requirements for plastic packaging within six months of the law coming into force. There are currently at least 4,000 such large enterprises operating in the Philippines, but as of February 2024, only 876 had registered.[16] Furthermore, the law mandates that these obliged companies must achieve 'plastic neutrality' by recovering or offsetting 80% of their 'plastic footprint' by 2028[17] and may use plastic credits as a means of doing so.[18]

The Act defines plastic neutrality as referring to "a system or its desired outcome where, for every amount of plastic product footprint created, an equivalent amount thereof is recovered or removed from the environment by the product producers through an efficient waste management system".[19] The Act notes that programmes may achieve plastic neutrality by including offsetting, and notes that standards relating to plastic neutrality will be established. Accordingly, there is some uncertainty as to exactly what is permitted. A concern is thus that credits may be seen as providing equivalent outcomes to the establishment of collective EPR schemes whereby producers cover the costs of comprehensive packaging waste collection and management.

The Philippines' model proposes that plastic producers and manufacturers may purchase plastic credits only from properly accredited collectors and processors (e.g., recyclers, waste-to-energy plant operators, cement co-processors, users utilising plastic in roads) or organisations exporting plastic for processing to ensure that an equivalent amount of packaging waste has been recovered and recycled to meet their waste management obligations.

Example of a credit system used to demonstrate compliance

The Philippine Alliance for Recycling and Materials Sustainability (PARMS) is a non-profit organisation established in 2014 in the Philippines with the mission of driving sustainable waste management, circular economy and recycling in the country. PARMS emphasises the importance of EPR as a key approach to holding producers accountable for the entire life cycle of their products and "facilitate the integration of EPR programs".[20] Their investing

[15] The UK has also used a credit system to comply with EPR, called a Packaging Recovery Note (PRN) system, whereby obligated companies purchase PRNs from reprocessors to show that they have recycled the required amount of packaging. However the UK is now moving away from this system to a new EPR system whereby the costs of managing packaging waste are covered by direct contributions from obligated producers.
[16] Manila Bulletin (2024) DENR: 900 companies now registered with EPR Law. Available at: Link
[17] Congress of the Philippines (2022) Republic Act No. 11898. Available at: Link
[18] Under the law, obliged enterprises (OEs) that generate either rigid (SEC.44-C: b-rigids PET/PE/PP, d-PS) or flexible (Sec. 44-C: a-sachets, c-bags, d-PS) plastic packaging must recover or offset their respective plastic packaging footprint – therefore, for example, if flexible plastic packaging is placed on the market, then by 2028, 80% of that flexible plastic packaging must be recovered (not rigids).
[19] Republic of the Philippines – Environmental Management Bureau (n.d.) Extended Producer Responsibility Law. Available at: Link
[20] PARMS (n.d.) Who We Are. Available at: Link

partners include large corporations such as Unilever, Nestle, Mondelez International, P&G, TetraPak and Coca-Cola, and other partners span industry associations, waste diverters, academia and NGOs.

In line with the developments of the Philippines' Extended Producer Responsibility Act of 2022, in February 2023 PARMS officially submitted to the Department of Environment and Natural Resources (DENR) their Zero Waste to Nature (ZWTN) EPR Program, inviting obliged enterprises to join this program to help meet their own waste diversion and recycling obligations.

As part of the programme, PARMS run a ZWTN EPR Portal[21], which serves as a marketplace for their **Waste Diversion Credit System**. The portal provides a platform for the trading and exchange of **Waste Diversion Credits**, enabling obliged enterprises under the EPR law to meet their obligations by purchasing credits. PARMS states that "proceeds from the sale of credits go directly to waste diversion chains and serve as an important source to make their business model viable and investable." The website also states that:

- "The proceeds will serve as an incentive for waste recovery entities to start collecting and managing flexible plastics with low diversion value that aren't already recycled."
- "The proceeds also inclusively and equitably support waste sector livelihoods, which are usually composed of informal workers."

The PARMS EPR Portal has a total of 236 obligated enterprises (OEs), 302 volunteering entities (who are not obligated by EPR law to comply, but choose to participate voluntarily), 73 registered waste diverters (who collect, recover and/or recycle the waste), and 71 registered external auditors.

According to reporting data shared to the project team by PARMS, in 2023 the OEs operating under the PARMS scheme achieved the following "diversion":

Table 2: Plastic packaging waste diverted in 2023 by OEs under the PARMS scheme

	Rigids	Flexibles	Total
Plastic footprint (tonnes)	102	65	**168**
Plastic waste diverted (tonnes)	26	29	**54**
% diverted	25.3%	43.7%	**32.5%**
Target for % diversion required by end of 2023	20%	20%	**20%**

Of the rigids, 74% was sent to mechanical recycling, 15% to co-processing, 9% to alternative recycling, 1.2 % to "collection" (which is not a treatment route) and the remaining 0.05% to "reuse or repurpose". Of the flexibles, 56% was sent to co-processing, 36% to mechanical recycling, 5% to alternative recycling, 1.3% to "collection" (which is not a treatment route), 1.1% to landfill, and the remaining 0.06% to "reuse or repurpose".

Unlike the other schemes explored in this study, there is a lack of available information on the scheme's website regarding the certification process, the process of issuing credits or

[21] PARMS (n.d.) ZWTN EPR Portal. Available at: Link

issuance process, or the project cycle for projects to be certified. Although some information is available on the waste diverters[22] and the private companies (OEs)[23] wanting to join the scheme, detail is limited. For example, in the waste diverters part of the website, definitions are not given for the "Mode of Recovery" (i.e. diversion type), such as what is meant by "alternative recycling".

3.2.2 India

Whereas in the Philippines plastic credits are one of a number of ways of demonstrating compliance with EPR requirements**, Indian legislation** requires plastic credits as the *only* form of evidence to demonstrate compliance with EPR obligations. The legislation defines qualification to become a plastic waste processor.[24] This ensures the relevant recycling certificates (that act as credits) are generated only by plastic waste processors (PWPs) operating in the country and registered under the law (except in the case of plastic waste in road construction where a self-declaration pro forma must be submitted by producers).[25]

Where urban local bodies (ULBs) are already providing relevant services and facilities for plastic waste management (transportation, Mechanical Recycling Facilities (MRFs), etc.) to support the activities of PWPs, they can be issued certificates by the PWPs in lieu of the facilities provided. The certificates generated by approved waste processors (and those transferred to ULBs) are then sold to the obligated producers, importer, or brand owner (PIBO), through a centralised portal at a market rate to generate revenue for the plastic waste processors.[26] A registered PIBO who has fulfilled their EPR targets can use surplus EPR certificates to offset a shortfall of previous years, carry it forward for use next year, or sell it to other obligated producers, importers, and brand owners.[27]

Globally, it is estimated that the vast majority of plastic credits have been generated in India, likely as a result of the obligations put in place for PIBOs.[28] However, it's notable that competition between providers of plastic credits, coupled with the ability of recycling and treatment companies to generate credits, means that credit prices could fall below the full cost of plastic waste management when recycling targets are low.[29] As targets increase in India from 30-50% in 2024-25 to 60-80% in 2027-28 and onwards, credit prices may increase as demand may exceed supply.[30]

Additionally, the most prominent global players involved in developing plastic credit schemes (see section 3.3) do not account for sorting and transportation of plastic waste. Therefore, to meet obligations in India, producers must purchase credits from organisations across the waste management life cycle, including ULBs. However, there is no formal mechanism in place for informal waste workers (waste pickers) to receive any benefit from the collection or processing of waste[31], as credits can only be allocated to PWPs and ULBs. This approach is in stark contrast to that of Brazil, which is discussed in more detail below.

[22] PARMS (n.d.) ZWTN EPR Portal. Available at: Link
[23] PARMS (n.d.) ZWTN EPR Portal. Available at: Link
[24] Plastic Waste Processor (PWP) refers to recyclers or any entities engaged in converting plastic waste to energy/oil or industrial composting.
[25] The Gazette of India (2022) Plastic Waste Management Amendment Rules 2022. Available at Link
[26] CEFLEXX (2023) EPR in Global South. Part 2 – a deeper dive into countries and regions. Available at Link
[27] The Gazette of India (2022) Plastic Waste Management Amendment Rules 2022. Available at Link
[28] Sustainable Plastics (2023) Opinion: Southeast Asia's dominance in the global plastic credit market. Available at: Link
[29] EcoLogic (2020) India's Draft Uniform EPR Framework Misses The Uniformity It Promised To Bring. Available at: Link
[30] Cerclex (n.d.) Target Fulfilment in EPR for Plastic Waste Management (Extended Producer Responsibility). Available at: Link
[31] WIEGO (2023) Waste Pickers and EPR in India. Available at: Link

3.2.3 Brazil

In 2010, Brazil introduced the Brazilian Solid Waste Legislation (PNRS, from the Portuguese Política Nacional de Resíduos Sólidos), setting out the principles for the obligation of producers, importers, retailers and distributors to share the responsibility of ensuring that packaging waste is subject to reverse logistics with consumers and local authorities.[32] Under the law, producers are able to comply through installing points of voluntary collection and/or supporting cooperatives of collectors.[33] The PNRS also sets out the requirement for waste pickers to be integrated into the process, contributing to a wider drive to formalise the informal waste sector. However, the system has been criticised for excluding waste pickers operating outside of unionised collection cooperatives.[34]

In 2023, the PNRS was strengthened as Brazil introduced into its EPR law a Reverse Logistics Recycling Credit Certificates system. This change sought to operationalise the principles set out in 2010, by allowing producers to buy a credit per tonne of waste recycled on their behalf.[35] Due to the requirement to work directly with waste picker cooperatives, a significant portion of the credits are generated through informal sector collection. These cooperatives are then able to sell the physical material to be recycled, generating further income for waste pickers.

BVRio, a non-profit headquartered in Brazil, has developed a system to monitor EPR compliant transactions by integrating receipts into the Brazilian Tax & Revenue system. This system was designed by BVRio to help producers provide evidence of the purchase of credits directly from cooperatives and project developers. Whilst these receipts are sufficient to meet producer obligations, BVRio recommends that buyers certify their activities according to a voluntary standard in order to add an extra layer of transparency. The Circular Credits Mechanism was established by BVRio as a way for producers in Brazil to do this and is currently the main provider of plastic credits in Brazil. More detail on the integration of plastic credits into Brazilian EPR law is given in section 3.3.4.

[32] Global Rec (2021) Case study: Reverse Logistics for Packaging – Brazil's EPR Model. Available at: Link
[33] Ibá (2014) Draft Overview of Extended Producer Responsibility (EPR). Available at: Link
[34] Global Rec (2021) Case study: Reverse Logistics for Packaging – Brazil's EPR Model. Available at: Link
[35] Circular Action Hub (n.d.) Brazilian Solid Waste Legislation (PNRS). Available at: Link

3.3 Organisations issuing credits

This section of the report outlines the plastic credit schemes (and their associated standards) that list, register and certify projects, and issue them with credits which can then be sold on the open market. These schemes can therefore be said to represent the supply-side of the plastic credit market as they enable the supply of plastic credits through the projects they certify. Not all organisations offer the same range of services – for example, BVRio operates a market platform where buyers can purchase credits, whilst Verra does not.

The first third-party audited plastic credit standard was established by PCX Solutions in 2020, closely followed by Verra in 2021, to regulate and standardise the financing of plastic collection and recycling projects. Since then, the number of plastic credit standards has increased significantly, with several more schemes emerging, such as the Ocean Bound Plastics (OBP) standard run by Zero Plastic Oceans (ZPO). An overview of four of the most prominent plastic credit schemes is given in Table 3 below.

Table 3: Overview of four prominent plastic credit schemes

Scheme	Organisation	Plastic credit equivalent	Number of projects registered (at the time of writing)	Key features
Plastic Waste Reduction Standard (PWRS)	Verra	1 tonne	13	• Offers Waste Collection Credits (WCCs) and Waste Recycling Credits (WRCs). • Responsible for setting the standard and verifying plastic projects.
Plastic Pollution Reduction Standard (PPRS)	PCX Solutions	1 tonne	29	• The first third-party audited standard. • Its sister company PCX Markets provides a platform for the sale of credits.
Ocean Bound Plastics (OBP)	Zero Plastic Oceans	1 kg	8	• Concerned only with ocean bound plastics. • Credits are only issued for non-commercially recyclable plastics.

Scheme	Organisation	Plastic credit equivalent	Number of projects registered (at the time of writing)	Key features
Circular Credits Mechanism (CCM)	BVRio	1 tonne	102	• States that the social welfare of waste collectors is at the core of the scheme. • Concerned only with waste collection, but also provides guidelines for the recovery of collected waste.

The sections that follow describe each of these four schemes in more detail, starting with a high-level overview of each scheme and then presenting a market overview of each scheme showing the publicly available data on each. Where available, the market overview outlines the number of projects certified under each of the four schemes, how many projects have been issued credits, what tonnage of plastic waste has been collected/recycled under each, how many plastic credits have been issued and sold under each, and any data available on credit prices. Annex A.3.0 gives more detail on the published data of these schemes, including project names and credits issued under each project.

It must be noted that though some comparisons in scheme data can be made, it is not possible to make full like-for-like comparisons between the different schemes' data due to a lack of consistency in the data published by each scheme as well as how and where it is published. Furthermore, each scheme differs in the methodology, terminology and metrics they use, and in the type and format of information they choose to make public, making comparisons across different plastic credit programs difficult.

3.3.1 Plastic Waste Reduction Standard by Verra

Overview

Verra, a non-profit organisation that is also active in the carbon credit market, runs a plastic crediting mechanism called the Plastic Waste Reduction Program (Plastic Program). This includes a Plastic Waste Reduction Standard (PWRS) that projects must meet in order to be certified and eligible to generate credits. The PWRS was developed by Verra through the 3R Initiative[36], a partnership between Verra, BVRio, Danone, Nestlé[37], Tetra Pak, Veolia, Lloyd's Register, and several other advisory members. Details of the scheme are shown in Annex A.2.1 but below is a brief summary of the scheme.

Verra does not develop credit-generating projects, set the price, or organise the sale of credits. It owns the standard and verifies projects according to this standard. The projects must pay a fee to Verra for each of the steps in the verification process.

Projects can generate Waste Collection Credits (WCCs) and/or Waste Recycling Credits (WRCs) under the Plastic Program. WCCs are generated when a project is able to demonstrate that it has collected plastic waste from the environment for recycling or management through other routes including landfill. These projects may also perform sorting, shredding, decontamination or melting activities before transferring the plastic to the next stage of the value chain.[38] Waste Recycling Credits are generated when a project is able to demonstrate that it has recycled plastic through one or more of the following:

- Installing a new recycling facility (including mechanical and/or chemical recycling).
- Adding capacity or improving the technology of an existing recycling facility.
- Incentivising or facilitating an increase in the collection and/or sorting of plastic waste to enable an increase in its recycling.

Market overview

The data reported on the PWRS is taken from Verra's online PWRS registry[39].

Projects registered: At the time of writing[40], Verra has registered a total of 13 projects[41] under the PWRS, which together have collected/recycled a combined total of 98,876 tonnes of plastic. These 13 registered projects are located across 11 countries: 2 projects in Ghana, 2 in Indonesia and 1 in each of Thailand, Kenya, Ivory Coast, Senegal, Egypt, the Netherlands, Iceland, USA and Australia. Of these 13 projects, 8 have been issued credits and 5 have not yet.

[36] Verra (2019) New 3R Initiative for Reducing Plastic Waste – Accepting Applications for Standard Development Committee. Available at: Link
[37] It must be noted that despite helping to develop the PWRS, Nestlé have now publicly declared they do not use or buy plastic credits, and do not believe in them as a system – see section 4.2.2.
[38] Verra (2022) Plastic Waste Collection Methodology, v1.1. Available at: Link
[39] Verra (2024) Registry. Available at: Link
[40] 23rd July 2024
[41] ASASE Foundation Community-based Collection and Recycling Project (Ghana), Batam Ocean Impact Project (Indonesia), Conceptos Plásticos - The WaY Cote d'Ivoire (Ivory Coast), Deekali Plastic Recovery West Africa: Recycling, Reuse and Community Action (Senegal), Far North Queensland Farm Plastics Project (Australia), Ghana Plastic Waste Recovery and Recycling Project (IntegriCo - Production of Composite Timbers from Plastic Waste, Sarepta (USA), Plastic Waste Recycling & Improving Waste Picker Livelihoods in Kenya (Kenya), Project STOP (Indonesia), Pure North: Sustainable Plastic Recycling in Iceland (Iceland), Second Life Thailand: Ocean-Bound & Land Plastic Recovery, Recycling and Reuse (Thailand), Upsyde: Producing durable goods from hard-to-recycle plastic waste (Netherlands), VeryNile - Nile River Cleaning Plastic Offsetting Program (Egypt).

The material types named under each project include "Composite material", "PP", "HDPE; LDPE; PET; PP", "Flexible material" and more, showing the wide range of different projects that operate.

Credits issued: The 8 projects that have been issued credits have been issued a combined total of 10,146 credits (equivalent to 10,146 tonnes of plastic collected/ recycled). 4 of these projects are "Plastic Waste Collection" projects, 1 is a "Plastic Waste Recycling" project, and 3 are both "Plastic Waste Collection and Recycling".

The 10,146 credits issued to the 8 projects so far have the following characteristics:

- The average time it took these credits to be issued (between the vintage end date[42] and the credit issuance date) was 1.4 years.
- A total of 76% of these credits were Waste Collection Credits (WCCs) and the other 24% were Waste Recycling Credits (WRCs).
- In terms of material type of the material collected/recycled, a total of 41% of the credits issued were issued for materials listed as "other plastics", 32% for "composite material", 24% for "PP", 3% for "flexible material" and just 0.1% as "HDPE; LDPE; PP".
- 100% of the credits issued for "composite material" and "flexible material", and 93% of the credits issued for "other plastics" were WCCs. The vast majority of these types of materials to date have therefore been issued WCCs rather than WRCs.
- 87% (2,142) of the 2,463 WRCs that have been issued, meanwhile, have been issued for PP, with the remaining 13% to "other plastics" and a mixture of "HDPE/LDPE/PP".

Credits sold: However, of the 10,146 credits issued, only 228 have been retired (sold), which is just 2.2% of the total.

The language used when these purchases are made are often "environmental benefit" as the "retirement reason", and "plastic footprint mitigation" as the "retirement details".

3.3.2 Plastic Pollution Reduction Standard by PCX Solutions

Overview

PCX Solutions, headquartered in the Philippines, established the first third-party audited plastic credits standard, the Plastic Pollution Reduction Standard (PPRS), in 2020. Details of the scheme are shown in Annex A.2.2 but below is a brief summary of the scheme.

The PPRS has been designed to align with EPR laws, in particular in the Philippines where EPR regulations allow for the use of plastic credits. As a result, 57% of PPRS projects were listed in the Philippines in 2023.[43] Projects listed under the PPRS may generate credits through the collection and processing of plastic waste. For a project to generate credits, an end-of-waste destination must be included in the project scope to avoid the return of plastic waste to the environment.

[42] The end of the period for which plastic waste management activities took place.
[43] PCX Markets (2024) 2023 Impact report. Available at: Link

Projects may choose to treat the plastic waste using any of the following methods:

- Material recovery (including mechanical, chemical, biological or organic recycling).
- Energy recovery (including heat, steam or electricity generation).
- Any other Best Available Technology (BAT) that has been reviewed and approved by PCX Solutions.

Projects registered under PPRS are able to generate 1 credit per metric tonne of plastic waste which has been collected, treated at an end-of-life facility and has been audited by a third party.[44]

Market overview

PCX Solutions do not currently have a PPRS registry available online which contains the full list of PPRS certified projects and the full list of PPRS credits issued to these projects, that can be downloaded by users (like Verra, for example). Therefore, at the time of writing, it relies on the user navigating to the PCX Marketplace[45] and then under the Accreditation Standard drop down box, selecting PPRS as a filter, to see the full list of PPRS projects. However, PCX have confirmed in communications with the project team that they "will soon publish an own PPRS registry which is in the final stages of development, which will show all PPRS projects and all PPRS credits issued under those projects."

Projects listed: As of July 2024 there are 29 PPRS projects listed on the PCX Marketplace website. 14 of these projects are co-processing projects, 11 are recycling projects and 4 are upcycling projects. The term "co-processing" is used to describe 'a form of waste-to-energy recovery', which involves burning plastic waste to generate alternative fuels. The above would seem to indicate that around 50% of the projects use "co-processing" to dispose of waste. However, according to PCX Solutions, in 2023, 68% of recycling projects used "co-processing" to dispose of waste (excluding collection only projects).[46]

Credits issued and sold: Unlike Verra, which issues credits at the time of accreditation, PCX Solutions only issues the credits after they have been purchased. Due to the fact that there is currently no PPRS registry available online which contains the full list of PPRS certified projects and the credits they have sold, it is not possible (without having to manually click into each of the 439 registry of transactions and verify which transactions are linked to PPRS projects) to ascertain how many credits have been issued to and sold by PPRS certified projects.

3.3.3 Ocean Bound Plastics by Zero Plastic Oceans

Overview

Ocean Bound Plastic (OBP) credits are a type of plastic credit developed by Zero Plastic Oceans (ZPO), a non-profit headquartered in France. Further details of the scheme are shown in Annex A.2.3 but below is a brief summary of the scheme.

The organisation is focused on removing low value ocean bound plastic from nature. Ocean bound plastic is defined by ZPO as 'Abandoned Plastic Waste that will eventually end up discharged in the ocean by the effect of winds, rainfall, river flow or tides', although to date there is no international or widely accepted definition of OBP.[47] ZPO breaks down OBP into four types – potential OBP (located within 50km from shore); shoreline OBP (found within 200m of the high tide limit and 100m of the low tide limit); waterways OBP (located within a

[44] PCX Solutions (2024) The Plastic Pollution Reduction Standard V8. Available at: Link
[45] PCX Markets (2024) PCX Marketplace. Available at: Link
[46] PCX Solutions (2024) Real Impact Report 2023. Available at: Link
[47] Zero Plastic Oceans (2024) OBP Program Definitions & Annexes. Available at: Link

river stream or 200m either side of a river stream); and fishing material OBP (fishing materials returned to shore by fishermen that would otherwise be discarded or plastic collected during fishing activities as bycatch). Each OBP Credit is equivalent to 1kg of low value OBP that has been removed from the environment and adequately treated by a certified organisation (as opposed to 1 tonne like with PCX Solutions and Verra). This could cause confusion for buyers looking to compare plastic credits across various projects.

For a project to generate an OBP credit, the plastic it collects must be non-commercially recyclable and treated 'adequately' according to four conditions set out by ZPO:

- Treatment facilities must possess an environmental license from relevant authorities.
- Treatment facilities must operate in such a way that no plastic leakage occurs from any of its facility premises.
- Treatment technology and methodology ensures that plastic incorporated into the process will not leak back into the environment.
- Treatment facilities comply with minimum social and environmental requirements specified in the neutralisation standard.[48]

Approved treatments may include waste-to-energy, landfill, recycling and/or reuse.

Market overview

The data reported on OBP is taken from their website. [49]

Projects certified: The OBP website contains a list of organisations holding a valid OBP certification. The "OBP Neutralization Services Providers" are those companies that have been certified to sell credits – there are 9 of these on the website (at the time of writing).

Credits issued: OBP's online registry[50] contains information on the credits they have issued as an organisation. At the time of writing[51], 71 credit batches, totalling 4,890 tonnes equivalent of credits, had been issued to 7 projects.

Credits sold/retired: Once OBP Credits "reach the final beneficiary (the organisation that will use them to offset their plastic footprint), the OBP Credits are retired." From this point on, they cannot be traded or used anymore. At the time of writing[52], 228 transactions (credit retirements) had taken place. However, there appears to be no option to download this data in one single file, in the same way as is possible for the Verra (PWRS) projects, therefore detailed analysis has not been able to take place so far for these, e.g. to find out how many credits have been issued and sold compared to issued but not sold.

3.3.4 Circular Credits Mechanism by BVRio

Overview

BVRio is a non-profit organisation that was established with the goal of developing market mechanisms which comply with Brazilian environmental laws. In 2013, BVRio launched the world's first waste credit system (Reverse Logistics Credits) in line with Brazil's then newly

[48] Ocean Bound Plastic Certification (n.d.) OBP Neutrality Certification Subprogram. Available at: Link
[49] OBP (n.d.) Certified Organizations. Available at: Link
[50] OBP Certification (2024) Registry. Available at: Link
[51] 24th July 2024
[52] 24th July 2024

established EPR legislation, which sought to connect informal waste worker cooperatives with organisations looking to collect and dispose of their solid waste.

More recently, the organisation created the Circular Credits Mechanism (CCM), which builds on the previous scheme by extending its scope internationally. The CCM project cycle is shown in Annex A.2.3 but below is a brief summary of the scheme.

Registration fees covered by buyers: The CCM project cycle has been designed to remove barriers to entry by allowing waste collection projects to register and post their self-declarations on the CAH without paying upfront costs.[53] Once these projects have secured funding arrangements, the buyer is responsible for paying the registration fee and verification costs. This ensures that the revenue generated from the sale of credits can be streamlined into waste collection activities, particularly towards the remuneration of informal waste workers, which incentivises further waste collection.

Approach to additionality: A key difference between CCM and other plastic credit schemes is its approach to additionality. Rather than claiming that CCM projects are 'additional', BVRio provides additional funding to organisations and cooperatives that are already managing plastic waste. CCM credits require the separation of payments for the sale of plastic collected from the environmental services provided (collection).[54] Projects listed on the CAH registry are also able to state how the funding is used, creating an additional layer of transparency.[55] This ensures that waste workers receive remuneration for both the waste materials sold as well as their labour, and creates an incentive for waste pickers to increase collection beyond their current activities. In this case, the additional funding results in an organic increase in capacity, rather than claiming to go towards additional collection where in fact waste pickers are already making a living out of collecting and selling recyclable waste materials.

BVRio recognises that waste credit systems are not a long-term solution for the plastic pollution problem, rather a solution that can deliver 'immediate benefit to communities and environments drowning in plastic'. [56] The organisation has ensured that provisions are in place to protect and incentivise the global network of informal waste workers, who are well placed to support in mitigating the plastic pollution problem, by including fair payment to waste pickers as its main requirement. The organisation has also demonstrated that plastic credits are not a 'one-size fits all' solution and has adapted its methodology from other well-established schemes to address this problem. BVRio has partnered with other organisations to run its own plastic projects, which aim to provide tailored solutions to the regions in which they operate. Some of these projects are discussed in Appendix A.5.5.

Market overview

Credits issued and sold: Unlike Verra, PCX and ZPO, the CCM standard operated by BVRio does not have an online registry where they publish the full list of projects certified to their CCM standard, nor the credits that have been issued to CCM projects. This is a transparency issue that should be addressed.

The Circular Action Hub platform, also operated by BVRio, does, however, publish their project registry and credit transactions registry, though this platform showcases projects and sells credits for projects which are not exclusive to the CCM standard, and it does not show

[53] BVRio. (n.d.) About Circular Credits. Available at: Link
[54] BVRio. (2023) How Plastic Credits can help reduce plastic pollution and increase recycling rates now. Available at: Link
[55] Circular Action Hub. 2024. Projects List. Available at: Link
[56] BVRio. (2023) How Plastic Credits can help reduce plastic pollution and increase recycling rates now. Available at: Link

which of these projects are CCM projects. This means there is no way of accessing the full list of CCM projects. Information on projects listed on the CAH website is outlined in section 3.4.2.

3.3.5 Summary of scheme data

Table 4 below summarises the data available for the 4 schemes, based on the data outlined in the preceding sections.

Table 4: Data on plastic credits to date

Standard	Projects registered/ certified	Projects issued with credits	Plastic waste collected and/or recycled (tonnes)	Credits issued (equivalent to tonnes)	Credits sold under this standard*	Price range or price point
PWRS[57]	13	8	98,876	10,146	213	*Unknown*
PPRS	29	*N/A***	90,300 [58]	81,928+ [59]	*Unknown*	$106-804
OBP[60]	9	7	*Unknown*	4,890	*Unknown*	$1,600
CCM[61]	*Unknown*	*Unknown*	*Unknown*	*Unknown*	*Unknown*	*Unknown*

*The schemes that provide the standards under which each plastic credit project is certified issue the credits but are not involved in their sale. This is the responsibility of each project. As of yet there is no registry on the PCX Solutions website that aggregates all of the projects certified to the PPRS standard in one list, in the same way as Verra do for their PWRS projects. However, as previously stated, the PCX Markets website lists 29 PPRS projects on their online registry, therefore this is the number used in Table 4.
**N/A (Not Applicable): Unlike Verra, which issues credits at the time of accreditation, PCX Solutions only issues the credits after they have been purchased, hence why this field is Not Applicable here.

3.4 Market platforms selling credits

This section of the report very briefly outlines the online market platforms which have been established with the purpose of advertising and selling the credits issued to the projects by the plastic credit scheme providers outlined in the previous section. It can therefore be said to represent the demand-side of the plastic credit market, linking sellers to buyers. More detail on these market platforms is shown in the Appendix A.4.0.

3.4.1 PCX Markets (by PCX)

PCX Markets[62], the sister company of PCX Solutions, is an online market platform for the sale and acquisition of credits issued by both the PPRS scheme (operated by PCX Solutions) and credits issued by other schemes such as PWRS and OBP. Parties who are interested in purchasing plastic credits can visit the PCX Marketplace website[63], where they can see all of the plastic credit projects which have been issued credits and are offering them for sale online (i.e. looking for a buyer). Users who click onto the website can see the project name and the price (in $ per credit) at which the credits are being sold by each project. The prices

[57] Verra (2024) Registry. Available at: Link
[58] PCX Markets (n.d.) Homepage. Available at: Link
[59] PCX Solutions (n.d.) Homepage. Available at: Link
[60] OBP Certification (2024) Registry. Available at: Link
[61] Circular Action Hub (2024) Projects Registry. Available at: Link
[62] PCX Markets (n.d.) Homepage. Available at: Link
[63] PCX Markets (2024) PCX Marketplace. Available at: Link

are set by the projects/project developers themselves (or another entity advising the projects) and not PCX Markets.

Interested buyers can filter by country (at the time of writing[64], ten different countries), plastic type (ten different types)[65], processing type (recycling, upcycling[66], co-processing, collection only or chemical recycling), accreditation standard (PPRS, PWRS, or OBP) and price (where they can specify the minimum and maximum price they are willing to pay), as well as project tags if they are looking for a specific type of project/credit or social angle (such as "empowering women", "community collection" or "collecting ocean-bound plastics").

Once users click on a project they are interested in, more information on that project is displayed, including a project description, annual capacity (in metric tonnes), what type of clean-up it is, the vintage year of the credit (when the credit was generated), the location, the plastic type, the processing type and the standard applied.

PCX Marketplace data[67]

At the time of writing[68], there were 35 projects selling credits listed on the PCX Marketplace website. It must be noted that the numbers change frequently as the market develops, so is only accurate at the time of writing, and is intended to give an overview.

The most common processing type is co-processing (40% of projects by number, 75% by annual capacity), where projects send collected plastic waste to a form of waste-to-energy recovery, which involves burning plastic waste to generate alternative fuels, or directly burning plastic in cement kilns.

The credit prices ranged from the cheapest at $106/credit to the most expensive at $804/credit, with an average price[69] of $360/credit (one credit in the PPRS standard is equivalent to one tonne of plastic and this unit has been used for all credits to allow for comparability).

PCX Registry of Transactions data[70]

Though the Registry of Transactions is not yet available to be downloaded in one single file online (and therefore has to be done manually), the PCX Markets team shared this data with the project team. This Registry of Transactions shows the date the credit was issued/purchased, the transaction ID, the name of the credit buyer, the location of the buyer, the number of credits issued/purchased, the purpose of the purchase (to comply with EPR or for voluntary purposes), whether the purchase is to claim a Net Zero Plastic Waste (NZPW) claim or not, and the credit serial number.

Between 2020 and 2024, at the time of writing, a total of 409 transactions have been registered on the PCX Markets website, totalling over 100,000 tonnes of plastic waste credits purchased. Around 41% of credits have been purchased for the purpose of complying with EPR, and 59% for voluntary purposes. The vast majority (94%) have been purchased by buyers located in the Philippines. The top 5 buyers of credits are NutriAsia Inc., Century Pacific Food, Inc., Monde Nissin Corporation., Nestlé Philippines, Inc. and Colgate-Palmolive Philippines Inc.

[64] 24th July 2024
[65] LDPE, HDPE, PET, PP, PS, PVC, Other/Mixed, Used Tires, PE, Nylon
[66] The PPRS defines this as the 'Process of converting waste products to new materials that are of higher economic value or quality than in the original product'.
[67] PCX Markets (2024) PCX Marketplace. Available at: Link
[68] 24th July 2024
[69] Not accounting for size of project.
[70] PCX Markets (2024) PCX Registry. Available at: Link

Transparency gaps

The Registry of Transactions does not yet have the functionality to download the full list in one single file. This is important as it would allow users to be able to access the full list of information they require. However, PCX have confirmed in communications with the project team that "they continue to evolve the registry to make it more accessible, and this is on their roadmap."

The Registry of Transactions list (which was shared with the project team by PCX) does not show the following, instead requiring clicking into each individual transaction manually:

- The credit standard used by each project from which the purchase was made (e.g. whether PWRS, PPRS or OBP)
- Collection source
- Processing type
- Plastic type
- Price

The Registry of Transactions does not show the price paid for each credit purchase (not even by clicking into each individual transaction manually).

3.4.2 Circular Action Hub (by BVRio)

The Circular Action Hub (CAH)[71] is a platform for the sale of waste credits, established and operated by BV Rio. The platform sells credits certified to BV Rio's CCM standard, but also sells credits certified to the PWRS (Verra) and OBP (Zero Plastic Oceans) standards. It therefore serves as a platform for all three credit standards.

Registered projects listed: At the time of writing[72], CAH's "Project Registry"[73] lists a total of 132 projects across 44 countries, whereas their "Projects List"[74] lists 127 projects. There is no detail, however, on their registry on how many of these projects are CCM, PWRS and OBP projects. Of these 127 projects, 103 are plastic projects, with the other 24 covering materials such as paper, beverage cartons, glass, metals, tyres, e-waste, medical waste, and "other".

Credits issued: Of the 132 projects on the project registry, only 14 have had their collection volumes verified and have therefore been issued credits. All of these 14 projects except for one (in Mexico) are located in Brazil. These 14 projects have been issued a combined total of 5,607 credits (equivalent to 5,607 tonnes). There is no detail, however, on their registry on how many of these projects are CCM, PWRS and OBP projects.

Credits sold: Of the 14 projects that have been issued credits to date, 13 of them have now sold all their credits, selling a combined total of 5,588 credits. All of the credits appear to be credits certified to the CCM standard.

[71] Circular Action Hub (n.d.) Homepage. Available at: Link
[72] 24th July 2024
[73] Circular Action Hub (n.d.) Projects Registry. Available at: Link
[74] Circular Action Hub (n.d.) Projects List. Available at: Link

4.0 Key risks and areas of concern

This section of the report explores some of the key risks and areas of concern found in this study associated with voluntary plastic credits.

Section 4.1 explores the risks to businesses in terms of potential reputational risks and greenwashing claims against them if they engage in plastic credit markets.

Central to most voluntary plastic credit schemes is the concept of '**additionality**'. This stipulates that, for a plastic credit project to be considered to be "additional", the activities funded by the proceeds of a plastic credit would not have been possible without this mechanism (credit) in place. Another way of presenting this concept is that a project is "additional" if it leads to genuine reductions in pollution beyond business-as-usual conditions (reductions that would have happened anyway without the intervention). Demonstrating additionality, however, is very challenging for several reasons. Firstly, in the credit schemes reviewed in this study, projects must collect, recycle, and/or process plastic waste before credits are issued to them. Therefore, projects involved in these credit schemes have often already collected, recycled and/or processed the plastic in the absence of the credit(s). Secondly, there is also a significant time lag between the issuance of credits and the sale of credits, with a lack of a guaranteed purchaser of the credit. Thirdly, there is often a lack of transparency about where and how plastic is collected/disposed of/processed, and whether these activities were truly 'additional'. For these reasons, it is very difficult to have confidence that purchasing credits leads to genuine additionality.[75] This issue is discussed in more detail in section 4.1.1.

The language and **terminology** used by organisations involved in plastic credit markets is sometimes loosely defined and potentially confusing. This is discussed in section 4.1.24.1.2. The most common terminology has been simplified and summarised in A.1.0 to provide consistency throughout this report. It should be noted that use of these terms varies between organisations, and these should not be treated as industry-wide definitions.

Section 4.2 discusses concerns around the robustness of plastic credit schemes' methodologies, including **auditing and self-reporting concerns**.

Section 4.3 explores issues with the **functioning of plastic credit markets**, namely difficulties with the apparent lack of demand for credits from the buyers' side, and the lack of credit price transparency.

Section 4.4 then discusses some of the negative **social impacts** that credit schemes may pose to local communities, waste pickers and vulnerable residents, including evidence of waste pickers being excluded from projects. It must be noted, though, that these impacts could also be associated with EPR if it's not well designed and overseen.

Section 4.5 then discusses evidence around the potentially negative **environmental and health impacts** of credit projects from poor waste management. The section explores the risks to people, as well as land and marine environments, of inappropriate waste collection methods, such as burning of collected waste.[76] Companies, for example, may choose an organisation or project that can collect and/or process plastic in a cheaper but more **carbon intensive** manner, as carbon emissions are not always accounted for in plastic

[75] It is important to note, though, that BVRio takes a different approach to additionality, as outlined earlier in the report.

[76] It is important to note, however, that this is an issue that applies not just to credits but instead is a wider challenge to do with waste management, and is therefore not always an issue that project developers or buyers have control over.

credits.[77] For example, the carbon emissions resulting from the treatment of plastic waste through incineration and waste to energy (WTE) is significantly higher than treating plastic through mechanical recycling.[78]

4.1 Greenwashing and reputational risks

4.1.1 Additionality of projects

A key area of concern relates to "additionality", a concept central to many of the schemes discussed in this report that offer credits in the voluntary market. This concept means that credits are supposed to prove that without intervention (in this case, the credit project, and subsequent credit purchase), the plastic waste would have otherwise ended up in the environment (in the case of collection credits) or would have otherwise not been recycled (in the case of recycling credits).

For example, the Verra methodology states that a project is deemed 'additional' if it is able to demonstrate that "the activity results in collected or recycled plastic waste that is in excess of what would most likely have occurred in the absence of the project activity and the activity would not have occurred in the absence of the incentive provided by the plastic crediting mechanism".[79] This definition presents potential difficulties from project developers in demonstrating that their activities are truly 'additional' for several reasons.

Firstly, the collection and/or recovery activities of a certified credit project take place before they have been able to secure funds from the sale of credits. Therefore, it is clear the collection and/or recovery activities have been able to take place and go ahead without the funds generated by a credit. This puts into question the additionality of the credits, and what additional value they are actually providing if the collections or recovery activities have already taken place.

Secondly, there is a significant time lag between the generation (issuance) of credits and the sale of credits, and there is no guarantee the credits will be sold. For example, a Verra PWRS certified project that was issued with 734 credits in March 2022, had only managed to sell 183 (25%) of them by October 2024, which is more than two a half years later. In addition, most (56%) of those purchases happened in the remaining 9 months of 2022, with the remaining 44% in the following 21 months, suggesting the likelihood of finding a buyer may decrease over time.

In the case of Verra, for example, because the credits are issued before a buyer is secured and before the credits are sold, there is a lack of a guaranteed purchaser and therefore projects could go through the project registration and certification process and be issued credits, but then never actually be able to sell (either some or all) those credits. There is therefore no guarantee the credit market will generate any revenue for their projects.

One stakeholder interviewed suggested that additionality is hard to prove with plastic credit projects because these projects very often rely on the informal sector to conduct the collections, and generating reliable data from these types of collections can often be more difficult than through formalised collection and centralised systems.[80] Other stakeholders interviewed also expressed their concerns with additionality, one saying that "the existing

[77] UNEP (2022) Assessing the contribution of plastic credit schemes to reducing plastic pollution and improving recycling. Available at: Link
[78] Coalition on Materials Emissions Transparency. 2022. Making Plastics Emissions Transparent. Available at: Link
[79] Verra (2021) Plastic Standard, v1.0. Available at: Link
[80] It must be noted, however, that where appropriately funded and supported, the informal sector (waste pickers) can also generate reliable data.

plastic standards should have more rigorous additionality measures in place", although they did not elaborate on what this could look like.

4.1.2 Loosely defined terminology

There are concerns relating to the claims that may be made by purchasers of plastic credits, which might leave them open to accusations of greenwashing. Such loosely defined terms include "plastic offsets", "plastic neutrality" and "plastic footprints".

The term "plastic offsetting" refers to producers compensating for the plastic they produce by purchasing credits for the collection and/or recycling of plastics. PCX Markets, for example, say that "to join the Plastic Cleanup Partner program, partners must purchase clean up credits that offsets their plastic footprint by volume".[81] This term could give the false perception that the impact of a company's production is completely eliminated (or offset) when an offset/credit is purchased, which is not the case.

PCX Solutions used to offer the opportunity for buyers to purchase credits that would allow them to be certified as a "Net Zero Plastic Waste (NZPW)" company. However, in March 2024, they announced a transition away from their NZPW certification, stating that "while the methodology we used to certify the Net Zero claims is robust and sound, there is no global consensus as yet on the terminology and methodology for Net Zero." The company notes that "since the NZPW certification came with a 3-year commitment, the NZPW label may continue to appear on some of our partners' packaging as we make this transition."[82]

The OBP programme, meanwhile, is comprised of several subprograms, including OBP Neutrality and OBP Recycling. This terminology is confusing, as neutrality in this case refers to "collection of non-commercially recyclable OBP", whereas recycling refers to "collection of commercially recyclable OBP" – however, under both programmes, plastic may or may not be recycled.[83] "Neutrality" also suggests that all the impacts have been removed or offset and therefore the end result is no impact, i.e. "neutral". However, far from neutralising the impact of plastic producers or even "offsetting" their production, credits are intended to make financial contributions towards the end-of-life management of plastics but are not intended to cover all end-of-life management costs nor to 'offset' all the effects of a company's plastic production. Purchase of credits which leads to companies being able to use a "net zero" or "plastic neutral" label on their products therefore risks misleading the consumer. As a result, project developers issuing credits under the OBP standard are known to have refused the sale of credits to organisations they suspect of exploiting the label for greenwashing purposes.[84]

The definition of Ocean Bound Plastic has also been widely disputed, as some claim that all plastic is ocean bound, whilst others claim that the term implies that plastic has been removed directly from the ocean when this is not always the case.[85]

Difficulties with calculating plastic footprints

Another inherent concern with plastic credits relates to the lack of standardised plastics accounting at international, national, and corporate levels, as Moon et al. argue in their

[81] PCX (n.d.) Plastic Cleanup Partner Program. Available at: Link
[82] PCX Markets (2024) The Plastic Cleanup Partner Program. Available at: Link
[83] Ocean Bound Plastic Certification (2024) Neutrality subprogram: OBP Neutralization Services Provider Standard. Available at: Link
[84] Interview with a project developer.
[85] ABC News (2023) Environmental advocates lodge ACCC complaint over 'ocean plastic' products. Available at: Link

paper[86], and the resulting difficulties in measuring corporate plastic footprints and therefore the true impact of a plastic credit purchase.

Some of the language around plastic credits is similar to that of carbon credits where, for example,1 tonne of CO_2 removed from the atmosphere generates 1 tonne of carbon credit in the process, and may be used to 'offset' 1 tonne of CO_2 emitted from any location, no matter where in the world that 1 tonne is emitted. However, applying the same logic to plastic pollution, and the plastic credits used to (in some cases) 'offset' this plastic pollution, is problematic for the following reasons.

Firstly, the impact of plastic waste on the environment varies according to where in the world that plastic waste enters the environment. Unlike GHG emissions, where one tonne of CO2eq represents virtually the same global warming potential (GWP) regardless of source or location, "plastic pollution is not only a global commons issue but also a transboundary environmental problem and a local-cumulative issue with highly localised spillover impacts."[87] In other words, plastic pollution is a localised issue with varying regional impacts, with the magnitude of its impact highly dependent on geographical location. For this reason, it is not possible to offset the impacts of plastic placed on the market in one location (e.g. in Europe) by removing an equivalent amount of plastic waste from another location (e.g. in south east Asia).

Secondly, unlike for carbon (GHG) emissions, there is currently no globally recognised measure for one tonne of plastic released into the environment, given the range of polymer types and applications that exist under the umbrella of plastics, and the differing levels of impact of each plastic, even at polymer level. Moon et al (2024) argue that the "'tonne to tonne' equivalence in plastic credits fails to capture the complexities of plastics from the perspectives of chemistry, material science, and environmental toxicology." Even at the polymer level, the chemical composition of a polymer differs from tonne to tonne. The level of colourants and additives present within many plastics affects the toxicity of the plastic, which then impacts how much damage it does to the environment if released.

The value of each tonne of plastic removed from the environment therefore varies significantly according to these factors, and indeed, it is not possible to accurately measure this. Currently, none of these variables are factored into the metric of a plastic credit in plastic credit schemes, with the impact of each tonne of plastic deemed equivalent no matter its chemical composition or level of additives. The harmful effects of different plastics cannot therefore be equated by a single global metric, but in the voluntary market, companies can pay to 'offset' a different type of plastic/polymer to what they produce. For example, companies producing lower value plastics (e.g. plastic films) can choose to pay for the recycling of plastics that are more easily recycled (have higher recyclability) and/or higher value (e.g. PET bottles) than plastics which are more difficult to recycle and/or have lower material value (e.g. mixed plastics, flexible films).

4.1.3 Licence to keep producing plastics

Several stakeholders interviewed believed plastic 'offsetting', through the purchase of plastic credits, is giving plastic producers a 'free pass' to continue producing plastic and is encouraging a 'throw-away culture', justifying the continued use of single-use plastics. Simply 'offsetting' the production of plastic through the purchase of collection or recycling credits will not solve the problem, particularly because the amount of plastic being put on the market is increasing every year, and the end-of-life management infrastructure in low- and

[86] Moon, S. et al (2024) 'Unpacking plastic credits: Challenges to effective and just global plastics governance' Unpublished manuscript.
[87] Moon, S. et al (2024) 'Unpacking plastic credits: Challenges to effective and just global plastics governance' Unpublished manuscript.

middle-income countries is not able to cope with this increased pressure. Several interviewees therefore believed credits were just a 'stopgap measure' that is delaying and distracting from action needed further upstream, which is to adhere to the waste hierarchy and focus on reducing plastic production and implementing refill and reuse solutions.

4.1.4 Waste pickers used for project credibility

Two waste picker associations interviewed believed that plastic credit schemes were attempting to use the informal sector (waste pickers) "as a means of gaining credibility for their projects", due to the perceived positive social impact of doing so. They believed that this was purely a greenwashing exercise, given the fact that local waste pickers were either being excluded from participating in credit projects in some cases, or if they were participating, their livelihoods were not improving as a result and they were not benefitting from them.

4.2 Auditing and self-reporting

Material Source conducted an investigation into PCX in 2023.[88] Their analysis of PCX's database showed that verification for its PPRS was "mostly missing or relies on self-reporting by companies". They go on to report that "while PCX's rules require companies to submit their reporting to a third-party auditor, 61 per cent of net zero-certified records showed no evidence of this."

One stakeholder interviewed also indicated that a contributing factor to the suspension of the Reciki project, registered to PWRS, was that Verra's methodology allows project developers to register a single project across multiple locations. The Reciki project was comprised of three different sites located across two regions of Indonesia - Bali and East Java. This could potentially result in complexities for the project developer in attempting to understand the social and regulatory nuances of a region, particularly for organisations headquartered in a different country to the project.[89] According to this stakeholder[90], the head of the village in which the incineration facility was built was not consulted prior to construction, despite the project registration documents indicating otherwise.[91]

Moreover, Verra Validation and Verification Bodies (VVBs), or auditors, are able to audit projects remotely, meaning that an auditor is not required to be present at the site for credits to be validated.[92] Whilst these can be an effective tool for cost savings and removing barriers to registration, remote audits are more difficult to execute in low-income countries due to a lack of digitalisation and unreliable internet connections.[93] The effectiveness of these audits is further hindered when considering the collection methods of the informal waste sector, which are not always able to generate reliable information.[94]

The two concerns above were also expressed by a stakeholder interviewed who looked into the Project STOP project in Jakarta and East Java (Indonesia). Due to the fact that the project applied for credits for collections happening across various sites/locations, not all of the sites were able to be visited and audited due to a lack of capacity. The interviewee

[88] Source Material (2023) 'Get Out of Jail Free' How plastics offsetting is giving industry a licence to pollute. Available at: Link
[89] Interview with a Bali-based organisation.
[90] Interview with a Bali-based organisation.
[91] Verra (2021) Reciki: Valorization of Waste, Systematic Diversion From Landfill And Leakage: Joint Plastic Project Description & Monitoring Report. Available at: Link
[92] Interviews with a Bali-based organisation and a representative of a waste picker association.
[93] Castka, P., Searcy, C. & Fischer, S. (2020) Technology-enhanced Auditing in Voluntary Sustainability Standards: The Impact of COVID-19. Available at: Link
[94] Interview with a Bali-based organisation.

commented that when an enquiry was sent to Verra to ask about this, a satisfactory answer was not received.

These types of audits are also potentially more likely to occur when multiple collection/recycling sites are listed under one project due to logistical difficulties, resulting in a lack of oversight of the social and environmental requirements put in place by Verra.

4.3 Functioning of credit markets

This section outlines two of the key issues found that interfere with the functioning of credit markets – lack of demand and lack of price transparency.

4.3.1 Lack of demand for credits

An exploration of the Verra PWRS credit data conducted for this study would appear to indicate that there is a significant lack of demand for credits from buyers in the voluntary credit market for PWRS credits. Out of the 993 credits issued by Verra in 2022 and 2023 to three registered projects, only 187 (19%) had been sold by October 2024.[95] This lack of demand is even more apparent if the credits issued to projects in January-March 2024 are included in the total – when these are included, the total number of credits issued totals 5,474, and only 237 (4%) have been sold. This would appear to show that credits are not a reliable source of income for these Verra certified projects. It is important to note, however, that a similar analysis cannot be conducted for the other three schemes mentioned in this study (PPRS, OBP and CCM) as these schemes do not show total number of credits issued vs. total number of credits sold in the same way, therefore it is not clear how many credits have been issued but remain unsold. Demand for the credits generated by these three schemes is therefore more unclear.

One stakeholder commented that the reasons for a real lack of demand to purchase credits in the voluntary plastic credit markets is the following. Firstly, corporates are reluctant to spend money on collection or recycling credits "until the market is institutionalised and established", and there is "stability in the market in terms of credit prices". Currently, the big range of credit prices on offer may be putting off buyers. Equally as important, corporates are reluctant to engage in these markets as "they want to avoid the reputational risks associated with credits, and want to avoid potential claims of greenwashing". This was an opinion expressed by other stakeholders interviewed too, who said that credits "are risky investments" in a similar way to carbon credits, and that therefore buyers are being careful to avoid any public backlash against them. One stakeholder believed a company should conduct serious due diligence before buying credits.

Another stakeholder interviewed believed "there is now a heightened awareness from brands and producers of the potential social impacts of plastic credit schemes", and they are therefore very careful about engaging in these schemes and markets, and purchasing credits. They also believed that buyers are taking their lead from the International Alliance of Waste Pickers (IAWP) on whether they should be purchasing plastic credits, and because the IAWP does not yet have an agreed position on plastic credits, they are holding back.

Another consequence of this lack of demand is its impact on projects. One project developer of plastic credit projects, who has projects listed under both the Verra PWRS and ZPO's OBP, stated they were not looking to expand their operations at the time they were

[95] Only 25% of the 734 credits that were issued in March 2022 to one project have been bought so far, more than 2.5 years later.

interviewed[96], due to a lack of demand for credits.[97] Another project developer expressed similar concerns, stating that currently the demand is "quite low", due to uncertainties around the robustness of claims associated with plastic credits.[98]

Nestlé are one example of a large global corporate who, despite being one of the organisations who initially helped develop Verra's PWRS (as part of the 3R initiative), have now publicly declared they do not use or buy plastic credits, and do not believe in them as a system. Instead, they "engage in direct collection, sortation and recycling or recovery partnerships… to address the root cause of the plastic pollution challenge". Their approach is to design packaging for recycling systems, advocate for well-designed EPR systems, and support collection projects in countries that have not yet scaled up their waste management systems.[99] They go onto say that "there are many different and sometimes contradictory global and national schemes, standards, and certifications for plastic credits" and "don't believe in the effectiveness of plastic credits without a credible, solid, and harmonized global standard."

In 2022, meanwhile, Coca Cola and Unilever announced they did not believe plastic credits were a solution to the plastics crisis, saying like Nestlé, that they wanted instead to be heavily involved in EPR schemes that hold producers responsible for plastic waste.[100]

4.3.2 Lack of price transparency

For credit markets to be a well-functioning market, there needs to be at least some visibility on market prices. However, across all four credit platforms and standards explored for this study, there is a lack of transparency on the prices paid for the purchase of credits.

Although the Verra registry does contain a record of the plastic credits that they issue to their registered projects, and also contains a record of those that are then sold by the project developer, Verra does not make public the prices that were paid for these credits. It is also then not possible to know how these prices paid (per tonne/per credit) might compare to the project costs, such as collection costs per tonne, treatment costs per tonne, administrative costs, etc. In order to be able to assess how prices paid compare to end-of-life costs, and how close producers (buyers) are to covering costs, it would also be necessary to know the project costs, which is also information that is not available.

PCX Solutions do not yet have a project registry[101], but list their projects on the PCX Markets website.[102] Each project on the PCX Markets website does list the price they are selling their credits for (the range of prices advertised are detailed in section 3.4.1) and shows whether the credits they are selling are "sold out" or not yet – however, the site does not show the prices that were actually paid for the credits, for those that did manage to find a buyer and sell them. The PCX Markets Transactions Registry[103], meanwhile, shows the full list of transactions (of PPRS credits but also PWRS and OBP credits), and gives details on who the buyers are, where they are buying from, and how many credits they bought, but again not the prices that were paid for these credits. Therefore, like with Verra, it is not possible to know how much buyers are actually paying for these credits and how these prices (per tonne/per credit) compare to the project costs.

[96] July 2024
[97] Interview with a project developer.
[98] Interview with a project developer.
[99] Nestlé (n.d.) What is Nestlé doing to tackle plastic packaging waste?. Available at: Link
[100] Eco-Business (2022) Coca-Cola and Unilever: We're not convinced by plastic credits. Available at: Link
[101] At the time of writing (10th October 2024)
[102] PCX Markets (2024) PCX Marketplace. Available at: Link
[103] PCX Markets (2024) Registry. Available at: Link

Both Zero Plastic Ocean and BVRio suffer from the same issues. ZPO's OBP publish an "OBP credits retirement" registry – although this registry does contain information about the transaction, it does not show the price paid for the credit. BVRio's Circular Action Hub, meanwhile, publish a credit transactions registry which contains information about the transaction (outlined in section 3.4.2), but again, it does not show the price paid for the credit.

Another related issue is the inevitable uncertainty to the project developer over the price to be paid for an individual credit. Plastic credits are a market mechanism and therefore, rather than the credit being priced at and sold at a price that will cover the full costs of plastic waste collection and/or recovery, the credit instead is determined by supply and demand. Project developers can set their own prices to try and sell the credits at the price they are seeking[104], but there is no guarantee this price will be paid, and no guarantee over whether the price paid will be enough to lead to additional collections or not.

4.4 Social impacts

Another key risk relates to the negative social impact of projects on waste pickers if projects are poorly operated and monitored, including potentially unfair wages, poor working conditions and harm to human health from toxic air emissions associated with the burning of waste. While it must be noted that negative social impacts could also be associated with EPR if it's not well designed and overseen – this issue has been raised by various stakeholders in relation to credits and comprises an additional reputational risk to purchasers.

Local waste pickers either excluded or not benefitting from the projects

Local communities have been involved in waste picking for many years before the arrival of plastic credit projects. However, engagement with stakeholders[105] has found that these waste pickers have often been excluded from being involved in these plastic credit projects, as there is "often no mechanism for them to independently be certified and be able to claim credits."

One representative of the International Alliance of Waste Pickers (IAWP) interviewed for the study commented on how affiliates of IAWP have expressed interest in receiving plastic credits, but complain that "their organisations have not been eligible due to reporting requirements being too complex or presenting too much of a barrier". For those select few affiliates that have worked in plastic credit projects, "the projects have not generated decent or ongoing work for their workers". These jobs were not formal positions with benefits, and so, in order to fill this gap, the waste picker organisations generally helped these workers enrol in government health schemes where they could.

By contrast, one local journalist who interviewed waste pickers in the Philippines who had been involved in a PCX project stated that although waste pickers have already been a key player in waste management before the arrival of these credit projects, and have earned a livelihood and income from conducting collections, the arrival of these credit projects has had the benefit of making waste collection more systematic and given them more job security.

One stakeholder believed "plastic credit projects rely on the hard work of waste pickers for the benefit of powerful actors who are capturing the majority of the revenue generated by the sale of the plastic credit". This was an argument also expressed by another interviewee who suggested that "the money is not reaching the communities on the ground it is meant to

[104] The PCX Marketplace data shows that projects on their platform are selling their credits at between $106 and $804/tonne, at the time of writing.
[105] Both with waste picker associations and others who have looked into specific projects.

reach", because of the many actors involved in the project that are taking a cut of the revenue generated. This opinion was also expressed by one local journalist who interviewed communities of waste pickers on the ground in the Philippines, who believes waste pickers only receive "a small portion of the benefits generated by the sale of a credit".

Another stakeholder interviewed suggested "there was a high risk to waste picker livelihoods if they are co-opted into participating in plastic credit projects to give these projects credibility."

One stakeholder commented that because plastic credit projects tend to involve intermediaries, these intermediaries will collect a portion of the fees from the sale of the credits and waste pickers and workers conducting the collections will receive a lower proportion of the revenue/income as a result.

Displacement of local waste pickers

One stakeholder interviewed discussed how there had been issues around plastic credit projects employing new waste pickers for the project and therefore "displacing the local waste pickers" who were already doing waste collection work before the start of the project. A representative of a waste picker association discussed how they heard of a report of migrant workers being hired for these roles instead of local waste pickers. Due to the work not being well paid, it generally did not attract local waste pickers to conduct the work but instead "hired itinerant migrants who only worked in the position for a short period before moving on."

Imbalance of power and lack of transparency

One stakeholder who looked into the Project STOP project in Jakarta and East Java (Indonesia)[106] found that there was an "imbalance of power" between the project operators and the local communities they worked with "due to the differences in professional capacity", meaning that the rights to the credits were ceded to the project operators. According to the stakeholder, the local communities did not have knowledge of how the money generated once the credits were issued would be used.

One local journalist who interviewed communities of waste pickers on the ground in the Philippines stated that one of the waste pickers he interviewed said "he wasn't aware of what happened to the plastic waste he had collected once he'd handed them over to PCX" for one of their projects. He went on to say that he believes waste pickers who conduct the collections do not have much awareness of the concept of "plastic offsetting". This would seem to suggest the experience of some waste pickers is that there is a lack of information communicated to them and they are not sufficiently involved in the process.

The Verra methodology, for example, lacks provisions for ensuring the social welfare of all actors involved in plastic projects, particularly waste pickers. The methodology stipulates that organisations should 'strive to ensure a living wage for all project actors', however this is not a requirement.[107] According to the Verra methodology, additional social welfare provisions such as formal employment contracts, health insurance, and education or training are also not covered.[108] As the informal waste sector comprises a significant part of the labour required to generate credits, one stakeholder stated they felt there is a risk that this group could be exploited and will not benefit from the profits made.[109] Whilst this could be difficult to implement in practice, transparency on social provisions in place should be given. In this

[106] Registered to the Verra scheme
[107] Verra (2021) Plastic Standard, v1.0. Available at: Link
[108] Verra (2021) Plastic Standard, v1.0. Available at: Link
[109] Interviews with a Bali-based organisation and a representative of a waste picker association.

regard Verra is, as described above, describing the situation transparently, and is not claiming that a living wage is provided for all project actors.

4.5 Environmental and health impacts

If guidelines for the safe and environmentally sound management of solid waste are not followed waste management may pose a potential risk to land and marine environments, and biodiversity. It is important to note, however, that this is an issue that applies not just to credits but instead is a wider challenge to do with all waste management, particularly in less developed countries, and equal caution must be taken when developing EPR schemes.

Plastics being burnt are potentially leading to air pollution issues and impacts on human health

A common opinion expressed by those interviewed for the study is that a large proportion of plastics that are collected through these plastic credit projects are being treated through 'co-processing', i.e. to produce refuse derived fuel (RDF) and/or energy from waste, rather than being upcycled or recycled. Co-processing has now become a common end-of-life treatment route for plastic credit projects – under Verra's rules, for example, incineration with energy recovery and co-processing in cement kilns is considered to be appropriate waste management.[110,111] Stakeholders interviewed argued that this can lead to significant local air pollution issues which are detrimental to the health of local communities residing by these facilities and the environment.

The data reviewed for this study would appear to support this view on the destination of collected plastics. On the PCX Markets platform, 40% of the projects by number are "co-processing" projects, and when looking at annual capacity, "co-processing" projects account for 75% (396,120 metric tonnes) of the combined annual capacity of all projects.

Meanwhile, a SourceMaterial investigation reported that more than 80 per cent of the plastic collected by PCX's programme, marketed as "meaningful, credible and sustainable", is delivered to cement manufacturers who burn it for fuel, "generating thousands of tonnes of greenhouse gases, as well as chemicals linked with cancer".[112] This same study found that just 14% of PCX credits are generated from recycling while the remainder (86%) comes from 'co-processing'.[113]

One local journalist who interviewed communities of waste pickers on the ground in the Philippines for the same story stated that there had been an instance of dust appearing on cars and houses in an area where plastic was being used in cement kilns. [114] The IAWP believe that credits are supporting waste activities that are questionable from both an environmental and human health perspective.

This is an argument that was commonly expressed across stakeholders interviewed. For example, one stakeholder who looked into the Project STOP project in Jakarta and East Java (Indonesia) registered to the Verra scheme, reported that "most of the waste collected was being sent to an asher, which is an incinerator with no pollution control."

[110] Plastic Standard (2022) PLASTIC WASTE COLLECTION METHODOLOGY. Available at: Link
[111] Break Free From Plastic & GAIA (2023) Smoke and Mirrors: The Realities of Plastic Credits and Offsetting. Available at: Link
[112] Source Material (2023) 'Get Out of Jail Free' How plastics offsetting is giving industry a licence to pollute. Available at: Link
[113] Source Material (2023) 'Get Out of Jail Free': How plastics offsetting is giving industry a licence to pollute. Available at: Link
[114] Source Material (2023) 'Get Out of Jail Free' How plastics offsetting is giving industry a licence to pollute. Available at: Link

One interviewee explained the "highly problematic" nature of burning plastics – whereas plastic pollution is both physical and visible, once these plastics have been burnt (either through pyrolysis, an RDF facility or in an incinerator), the chemicals contained within these plastics are emitted. The stakeholder suggested that "whereas previously the pollution was visible, once burnt this pollution is no longer visible", making its impacts "more dangerous".

It is important to note, however, that this is an area of concern that applies not just to credits but is a challenge to do with plastic waste management more widely, and is not always an issue that project developers or buyers have control over.

The interviewee went on to explain that if the chemicals of concern contained within these plastics and their associated health impacts were included in the calculations of the value of a 'co-processing' plastic credit, then "the value of this credit would be significantly reduced." Moreover, there are no measures in place within the PCX methodology to actively encourage greater use of mechanical recycling, or better still reuse and prevention. Therefore, organisations seeking to generate profits from plastic credits are more likely to opt for the easier, more cost-effective routes.

In June 2024, PCX Solutions updated its methodology to exclude landfilling from its methodology. Previously, projects could claim plastic credits under a specific 'plastic collection' methodology, which allowed for disposal at sanitary landfills.[115] Under the latest version of the methodology, all plastic credits are grouped under 'PPRS Credits' which requires both the collection and processing of plastic; however, a project may still use 'co-processing' or 'any other Best Available Technology (BAT)' as its chosen end-of-life treatment and still be awarded the same credit as a project which opts for recycling. Moreover, the PPRS methodology does not provide any further detail on what is meant by BAT.

Related to this point is the view of another stakeholder, who suggested that because 70% of plastic in Indonesia is low-value, flexible and/or non-recyclable, recycling credits do not work for these.

Breaching of local health regulations

Verra's Plastic Waste Reduction Standard recently gained media attention due to the suspension of the Reciki plastic project in Indonesia, certified to PWRS. The project was in breach of local planning regulations, as one of the incineration facilities was built too close to residential housing. Surrounding communities reported that they were experiencing bad odours, potential leakage of leachate into waterways, possible dumping of excess waste into rivers and black smoke.

Verra's standard stipulates that 'Projects and the implementation of project activities shall not lead to the violation of any applicable law, statute or regulation, regardless of whether or not they are enforced'. Despite this, the project was registered according to the Verra standard and was only suspended following the receipt of 'substantive comments from stakeholders about the…project'. The project was suspended by Verra in May 2023 whilst a quality control review took place. As of September 2024, no quality control review report has been published on the Verra registry and the review is ongoing.

Hazardous work

One interviewee commented that one organisation of waste pickers received credits for short-term work that was incredibly hazardous, involving entering drainage systems and removing plastic blockages, without the adequate personal protection equipment (PPE).

[115] PCX Solutions (2022) Plastic Pollution Reduction Standard V7. Available at: Link

5.0 Differences between credits and EPR

Currently, the regulatory interaction between EPR and plastic credit schemes is limited. The only EPR schemes that include plastic credits are in India, Brazil and the Philippines – these schemes are outlined in section 3.2.[116] This section now focuses on the fundamental differences between EPR schemes based on cost recovery and credit schemes.

EPR is a centrally managed system that, if designed and implemented well, can provide a co-ordinating role as waste collection and management is scaled up. Credits, however, cannot do the same – **credit schemes channel funding towards collection and recovery projects on an individual basis**, as opposed to providing funding in a systematic way across waste management, which EPR is designed to do.

Cost recovery is the guiding principle of EPR but not of credits. Well-designed EPR systems cover the costs of waste management, and have performance standards in place to improve waste management over time. In established EPR schemes, the focus tends to be on covering the costs of collection and sorting – total system costs are calculated, and then EPR fees are charged to producers, depending on how much packaging, and of which type, they place on the market, in order to cover these costs. EPR is therefore guided by the polluter pays principle (PPP), which states that polluters (in this case plastic producers) should be held responsible for the full costs of their production activities.

While EPR may seem a challenging form of regulation for some countries to implement, the key element is to establish a form of cost recovery from producers, as described in a recent paper from Reloop.[117] This might initially take the form of a levy on producers, or some other simplified means of cost recovery, but should always be guided by the key principle that costs should be covered by producers.

Plastic credits, on the other hand, **do not cover the costs of waste management**. Fees are not charged to producers to cover costs in the same way. Instead, individual credit project developers set the price of their credit per tonne, hoping to find a buyer that will pay that price. In practice, the value of credits is determined by market forces of supply and demand – credit prices therefore vary enormously, as indicated by prices ranging between $100 and $1,600 per tonne (see section 3.3.5). Even in a well-developed credit scheme such as the UK's Plastics Recycling Note (PRN) system (which has been a mandatory requirement for many years), producers are estimated to cover only 10% of the actual costs, which means that most of the cost is borne by local authorities, other public authorities and businesses who consume packaged goods.[118] This is not full cost recovery or even close to full cost recovery.

Whereas EPR schemes are designed so that they can fund the full costs of waste management, from collection through to transport, sorting and then end-of-life treatment (whether that is recycling, reprocessing, incineration or landfill), **credits vary in terms of what they fund**. Some credits are focused on collection (e.g. Verra's Waste Collection Credits, WCCs), whereas others are focused on reprocessing/recycling (e.g. Verra's Waste Recycling Credits, WRCs). With regards to credit systems used to demonstrate compliance, in India, for example, the credits are generated by re-processors, and urban local bodies (municipalities) that provide collection, sorting and/or transport services can register with the scheme to be

[116] The UK has also used a credit system to comply with EPR, called a Packaging Recovery Note (PRN) system, whereby obligated companies purchase PRNs from reprocessors to show that they have recycled the required amount of packaging. However the UK is now moving away from this system to a new EPR system whereby the costs of managing packaging waste are covered by direct contributions from obligated producers.
[117] ReLoop (2023) Simplifying Extended Producer Responsibility for an International Legally Binding Instrument on Plastic Pollution. Available at : Link
[118] Scottish Government (2023) Reforming the UK packaging producer responsibility system: Partial Business and Regulatory Impact Assessment (BRIA). Available at: Link

allocated some of these credits and therefore for some of these costs to be covered too. However, there is no mechanism for the informal sector to receive any benefits (payments). This is different to the BVRio approach in Brazil, another system that uses credits to demonstrate compliance. The BVRio approach ensures that provisions are in place to incentivise the use of informal waste workers. In this scheme, waste worker cooperatives in the informal sector are connected with organisations looking to collect and dispose of their solid waste, and waste pickers directly receive remuneration for both the waste materials sold as well as their labour.

In schemes where credits are used to demonstrate compliance, credit prices will depend on the collection or recycling targets that are set in legislation. In India, for example, the plastic packaging recycling target is currently quite low, with the national database suggesting there are more than enough credits available to meet these targets – therefore with the supply being high, credit prices are low as a result.

EPR and credits should not compete with one another. There is ample evidence that EPR is preferable, and therefore national legislators should seek to introduce full cost recovery through an EPR system, not through credit schemes. As a stakeholder interviewed commented, **plastic credit projects tend to be both small scale and localised, as well as temporary in nature**, and therefore, cannot reliably pave the way for EPR.

A final point relates to the material streams targeted by EPR compared to credits. With the exception of BVRio's CCM and CAH, credit schemes focus on the end-of-life management of plastics only, and not on other material streams. Full EPR, on the other hand can, and should cover all relevant materials, which is both more efficient and more effective.

6.0 Summary of findings and key recommendations

If plastic credits become established as a mechanism to tackle plastic pollution, both in the voluntary market, and more importantly, as a possible form of achieving regulatory compliance, there is a considerable risk this will undermine genuinely transformative collective action that could be achieved under full cost recovery EPR.

Unlike EPR, plastic credits are not a mechanism for systemic and transformational change in waste collection and management infrastructure, but rather a source of potential contributory funding towards individual projects. Credits cannot bring about significant scaling of plastic recycling systems or address the root causes of poor waste management because they suffer from a number of significant weaknesses.

Firstly, as the prices for credits depend on the balance of supply and demand of such credits, prices paid bear no relation to the costs of the underlying activity. In a situation where there is a surplus of credits supplied relative to the number of buyers, the price for the credits will be low (or indeed the credits will remain unsold as has been seen in existing schemes to date). Where demand exceeds supply, in principle it may be that the prices paid *exceed* the costs of the underlying activity.

What this means for sellers is that credits do not provide a reliable income stream. For purchasers, if operating within a system that relies on credits to demonstrate compliance, the future price of purchasing such evidence of compliance may be volatile and thus difficult to predict – and may also, as noted above, exceed the net costs of the underlying activity.

Secondly, and related to the above point, this means that credit revenues are unlikely to be seen as a reliable revenue stream by investors. This has certainly been the case in respect of the long-standing credit-based PRN system in the UK.

Thirdly, waste management has to function as a system. While credits may be issued for certain activities, they do not, and indeed cannot, play a co-ordinating role in developing the appropriate mix of overall activities to drive the necessary change. In this, waste management differs significantly from the use of credits for carbon emissions, where individual activities can take place largely independently of other activities, e.g. facility level actions to abate emissions, ecosystem restoration in certain locations.

A waste management system needs costs to be covered (net of material revenues), a clear view as to how the system can grow and improve performance over time, and co-ordination in terms of the strategic development of facilities. To attract investment, there needs to be a reliable counterparty. EPR schemes based on cost recovery can meet all of these requirements, credit schemes do not.

EPR schemes can provide cost coverage, a reliable counterparty for investors, and provide reassurance to producers that they are not paying any more than is necessary for a cost-effective service. This is well recognised by major producers. Coca Cola, Nestlé and Unilever, for example, have all identified EPR as the approach to be taken.[119,120]

The establishment of cost recovery through EPR should be a key focus of the UN Plastics Treaty. It is difficult to see how credits could play a role except for undertaking activities that are beyond the scope (either geographically or in terms of activities undertaken) of EPR.

[119] Nestlé (n.d.) What is Nestlé doing to tackle plastic packaging waste?. Available at: Link
[120] Eco-Business (2022) Coca-Cola and Unilever: We're not convinced by plastic credits. Available at: Link

However, due to the existence of credits already, in both the voluntary market and for compliance, the remainder of this section provides a set of practical recommendations on what role credits can play in tackling the plastics crisis. Section 6.1 provides a set of key recommendations for policy makers deciding how credits fit with legislation, section 6.2 provides key recommendations for potential buyers (e.g. corporates) on how they should approach plastic credits when making decisions about whether to purchase them, and section 6.3 provides a set of guiding principles that should be followed by credit schemes already in operation.

6.1 For policymakers

This section provides a set of key recommendations for policy makers on what role plastic credits should play in tackling the plastics crisis, given they have already made their way into legislation in some countries. The section explores how, and where, plastic credits should be used, including how they could pay for activities beyond the scope of EPR.

The following presents three scenarios for the recommended course of action for countries depending on what EPR and credit legislation they have introduced to date.

Case 1: **Countries that have already established a plastic credit mechanism as a means of EPR compliance** in their legislation (i.e. compliance credits), such as the Philippines, Brazil and India, should consider how the transition could be made to full cost recovery through EPR. This will ensure that fees paid by producers cover the required costs.

The voluntary plastic credit market, meanwhile, should only fund activities that are beyond the scope of EPR. This could include funding legacy clean-ups (addressing and remedying environmental contamination from past activities, such as cleaning waterways and beaches), though noting that other funding sources such as that proposed under the Polymer Premium are likely to make more meaningful contributions. [121] This could also include helping fill gaps in waste collection services that may for the time being not be covered by EPR (e.g., to support initiatives that provide services in remote regions/ to rural populations, to help provide equipment/ training to informal sector to support formalisation, etc.).

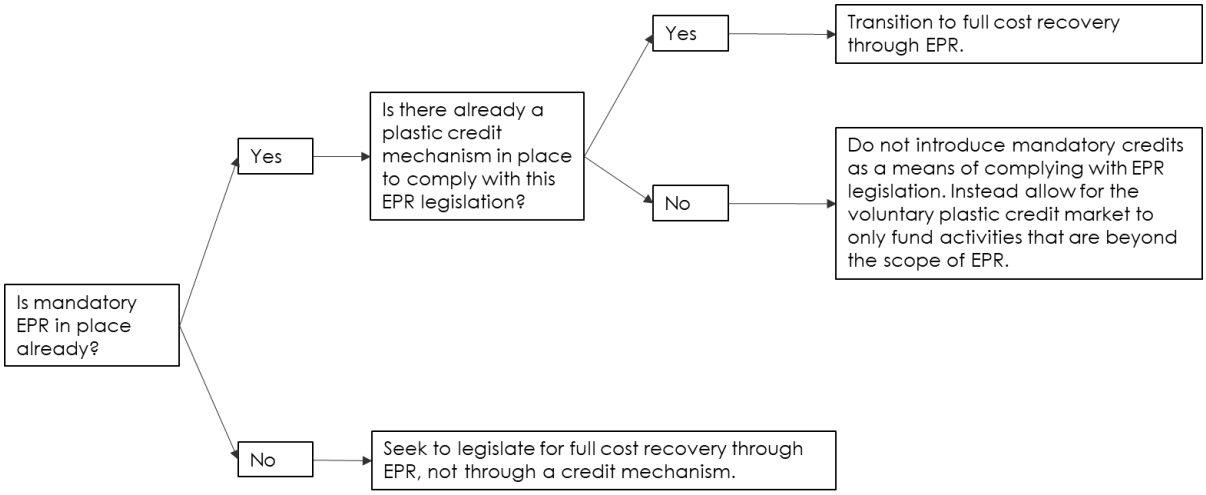
Case 2: Countries that have mandatory EPR in place already, and have not established a plastic credit mechanism as a means of EPR compliance in their legislation (i.e. compliance credits), should not introduce credits into their EPR legislation as a way of complying with EPR. Instead, they should allow for the voluntary plastic credit market to only fund activities that are beyond the scope of EPR (as in case 1).

Case 3: Countries that do not yet have mandatory EPR should not introduce compliance credits into legislation. Instead, they should seek to legislate for full cost recovery through EPR (or some other form of cost recovery) and allow for the voluntary plastic credit market to only fund activities that are beyond the scope of EPR (as in cases 1 and 2).

This decision tree is summarised in Figure 2 below:

[121] A fee imposed on the producers of primary plastic polymers – see Charles D & Cumming P (2024), The Polymer Premium: A Fee on Plastic Pollution, Minderoo Foundation

Figure 2: Decision tree for policy makers on the role of EPR and plastic credits



If the above decision tree is followed, then although credits may have helped provide some funding towards projects, they should move away from activities that are covered by EPR once a country is ready for mandatory EPR to be introduced.[122]

In the UN context, plastic credits should not have a role to play in the UN Plastics Treaty – the Treaty should focus on facilitating the transition towards full cost recovery through mandatory EPR schemes instead.

6.2 For potential buyers

This section explores the key recommendations for potential buyers of plastic credits. The section provides guidelines and recommendations for how corporates should approach the growing voluntary plastic credit market, as well as credit compliance schemes in cases where credits are already part of national EPR legislation.

As a potential buyer considering whether to engage in plastic credit markets and purchase credits, the following decision tree should be adhered to:

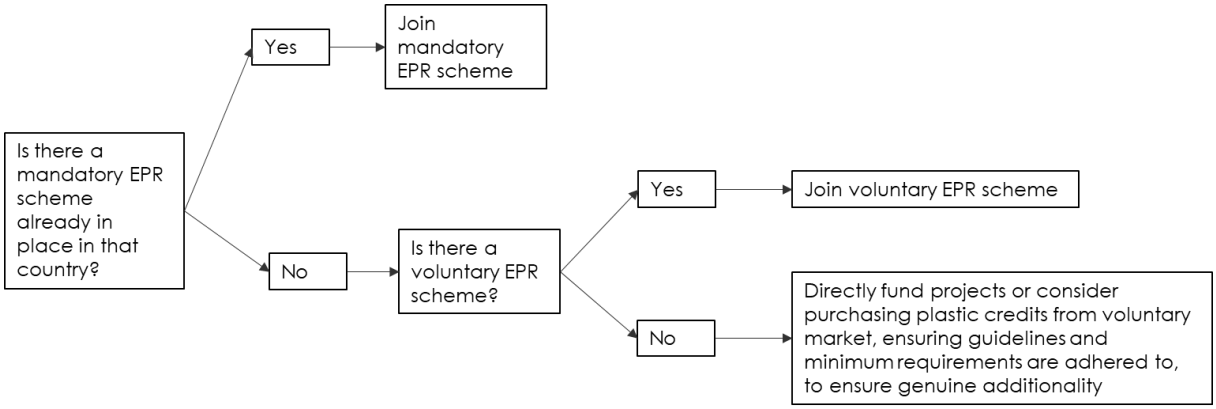
1. If the country in question has a mandatory EPR scheme in place, and you are an obligated producer, you should do what is necessary to meet the legal requirements.
2. If the country in question has no mandatory EPR, but there is a voluntary EPR scheme in place, you should join that voluntary scheme and support advocacy efforts to have mandatory EPR introduced.
3. If there is no mandatory EPR nor voluntary EPR scheme in the country in question, then directly fund projects if this is possible, or if not participate in the voluntary plastic credit markets by purchasing credits, ensuring appropriate due diligence and that the guidelines and principles set out below are followed to ensure good practice purchases. It is important to note that these purchases should be seen as

[122] It is important to note that for an EPR scheme to be effective and follow the polluter pays principle, it should aim for full cost recovery – fees should be set high enough to fully cover waste management costs, and fees charged to producers that place on the market hard-to-recycle plastics (e.g. plastic films) should be higher to reflect the higher cost of recycling of these types of plastics.

contributing a source of finance towards waste management but should not as a reliable source of income nor as a compensatory measure.

This decision tree is depicted in Figure 3Figure 3 below.

Figure 3: Decision tree for potential buyers of plastic credits



Nestlé, Coca Cola and Unilever are three examples of large global corporates who have publicly declared they do not believe in plastic credits as a system nor as a solution to the plastics crisis, and instead advocate for EPR. Nestlé's approach is to design packaging for recycling systems and advocate for well-designed EPR systems[123], whilst Coca Cola and Unilever say they want to be heavily involved in EPR schemes that hold producers responsible for plastic waste.[124]

If looking to purchase credits from a credit scheme operating in the voluntary market, then the recommendations outlined in the following sections should be followed to the extent possible:

Fund projects in locations where collection is not currently taking place

The geographical location of the project from which the purchase of credits is being made should be one where collection is not currently taking place. Purchasing a credit from this type of project should improve the likelihood of the credits being genuinely additional, i.e. provide funding towards collection, recovery or recycling that might not have taken place in the absence of credits.

The country in which the project is located should also ideally match the country in which the products are being placed on the market, and where therefore the negative impact of the end-of-life phase is being felt.

Fund projects that tackle the types of plastic you are responsible for

Ideally the project should specify whether it is focused on collecting/recovering rigid plastics or flexible plastics (or both), and ideally the polymer type too. Once this has been established, ensure you fund projects that tackle the types of plastic you are responsible for (that you are placing on the market). For example, if a producer produces flexible plastics, they should seek to fund projects that collect and recover flexible plastics, not (higher value) rigid plastics. If they produce multilayer packaging, they should seek to pay for projects that collect and recover multilayer packaging. This is a requirement in the Indian credit scheme,

[123] Nestlé (n.d.) What is Nestlé doing to tackle plastic packaging waste?. Available at: Link
[124] Eco-Business (2022) Coca-Cola and Unilever: We're not convinced by plastic credits. Available at: Link

and purchasers should seek to ensure a like for like match to the extent possible if purchasing credits in the voluntary market.[125]

Provide sustained funding

As discussed in earlier sections, credit prices are not stable for individual projects and are not indicative of costs either. Therefore, consider choosing a single project or programme to provide sustained funding throughout the lifetime of that project, rather than choosing to buy one-off credits across a range of projects based on which credits are cheaper.

Ensure monitoring of project

Buyers should consider the potential for unintended consequences in the plastic credit schemes and projects they choose to get involved in. To help avoid any reputational risks, follow the guidelines just listed when choosing which projects to fund. Monitor closely how the projects you are funding are performing on both social and environmental metrics, and ensure auditing of the project is taking place.

Avoid misleading claims and use more transparent terminology instead

Be aware of the claims made when purchasing credits and when releasing public communications about these purchases or financial contributions. Avoid the use of terms "plastic offsetting" or "plastic neutrality", as this language is inaccurate and can be misleading to the public.

It is also very difficult to prove additionality when purchasing a credit (as discussed in section 4.1.1), therefore the focus of the purchase should be on it providing top-up funds to projects.

Avoid the term "plastic offsetting": The term "plastic offsetting" refers to producers compensating for the plastic they produce by purchasing credits for the collection and/or recycling of plastics. The term is highly problematic because it gives the false perception that the entire impact of a company's production is eliminated (or offset) when an offset/credit is purchased. The term is particularly problematic for plastics for the following reasons:

- Plastics vary hugely in their chemistry and environmental toxicology, and therefore different types of plastic have different impacts. A 'tonne to tonne' equivalence in plastic credits cannot be achieved in the same way as it can for carbon credits.
- A company might be paying to collect and recover a different type of plastic to what it is placing on the market. This is due to the huge variety of different plastic applications and polymer types placed on the market.
- The effects of plastic pollution are localized, so the impacts of investing in plastic waste collection differ greatly from area to area.

Avoid the term "plastic neutrality": The term plastic neutrality refers to the point when plastic producers recover as much plastic waste from the environment (by purchasing plastic offsets/credits) as they produce, deeming their impact "neutral", i.e. net zero. This term is highly misleading and almost impossible to achieve in practice due to the same reasons as outlined above to do with "plastic offsets", but also in addition, due to it relying on an accurate measurement and calculation of a company's "plastic footprint". This is very hard to achieve due to the complexities of plastic chemistry.

More broadly, even under EPR with full cost recovery and 100% collection, there are still environmental impacts associated with the production of plastics and the waste

[125] Whilst noting that the Indian scheme should transition to full cost recovery through EPR.

management of plastics. The terms 'neutralising' or 'offsetting' can thus be misleading even if everything is collected and managed appropriately, and should not be used.

Instead, when purchasing credits use language such as "the purchase of these credits is intended to make financial contributions towards the end-of-life management of plastics in location x, but is not necessarily intended to cover all end-of-life management costs nor to offset our plastic production". This will ensure the public is clear what the purchase is for, and are not being misled with inaccurate claims.

6.3 For credit schemes

Where credit schemes are used to fund activities that are beyond the scope of EPR, these should adhere to a set of guidelines and principles that will both improve the likelihood of good practice projects being implemented and help buyers choose the credit projects with the best social and environmental impact. The recommendations are as follows:

Consider introducing minimum requirements for all plastic credit schemes

The PREVENT Waste Alliance Group argues that there is no, and should not be, a "one size fits all" solution for all plastic credit schemes.[126] This would seem sensible – differences between schemes naturally exist in terms of both what purpose each serves and in what country context each operates.

Regulating the voluntary market can be difficult given that buyers and sellers can be anywhere in the world. Instead of suggesting harmonised standards, it is recommended that a set of minimum requirements should be applied to all plastic crediting standards, such as those developed by the PREVENT Waste Alliance Group.[127] This could help guide the development of good practice projects and ensure that plastic recovery activities seek to result in positive environmental and social outcomes, and also ensure that project methodologies are transparent and inclusive of waste pickers.

When credit purchases are made, instead of trying to claim they are leading to additional collection, recycling and/or recovery (due to difficulties with proving genuine additionality), the language used should be about these purchases providing a source of funding or income towards collection/recycling/recovery, and no more than that.

Remove claims of "plastic offsetting" and "plastic neutrality" from all schemes

The terms "plastic offsetting" and "plastic neutrality" should be removed from all schemes. Ocean Bound Plastics, for example, offer "Ocean Bound Plastic Neutrality certifications" that enable the organisations in charge of collecting and treating plastics to issue and sell third-party verified plastic credits (called OBP credits), and allows the organisations buying these credits to have their "neutrality claims certified".[128] This language is misleading. Far from neutralising the impact of plastic production and distribution, credits are intended to make financial contributions towards the end-of-life management of plastics but do not cover all end-of-life management costs nor offset a company's plastic production.

Ensure terminology used for waste treatment methods is transparent and clear

We believe that currently the terminology used to describe projects accredited by credit schemes is not sufficiently transparent and clear, and therefore the public risks being misled.

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[126] PREVENT Waste Alliance Group (2023) Discussion Paper Plastic credit schemes and EPR – risks and opportunities. Available at: Link
[127] PREVENT Waste Alliance Group (2024) Guidelines on Minimum Requirements for Plastic Waste Recovery & Crediting Standards. Available at: Link
[128] OBP (n.d.) OBP Neutrality Certification Subprogram. Available at: Link

It is vital that projects that, for example, collect plastics but then send it to a "co-processing" (incineration) plant for treatment, rather than to a recycling plant, explicitly state this in the title (name) of the credit, so that it is clear to buyers and the general public that it is a recovery credit being sold, and not a recycling credit. This information should be readily available and easy to access rather than having to delve into the documentation to find this out.

Similarly, it is vital that project developers make goalposts and timelines clear, so that it is clear whether producers are supporting projects that only remove plastic from the environment (collection only) or whether they are supporting projects that additionally recycle it.

Buyers should cover all project costs

Buyers should be required to bear all the costs associated with the development of a credit project, including the registration process, the verification process, the auditing process and costs associated with collecting and reporting ongoing project monitoring data. This will also ensure projects are run transparently, and information is available to whoever seeks it.

Strive to improve income and conditions for waste pickers

It is clear from the stakeholder interview process and the literature reviewed that one of the key issues with plastic credit schemes to date has been a lack of improvement in the livelihoods and wages of the waste pickers who conduct the collections for these projects.[129] A key recommendation is therefore to seek to ensure that all waste pickers who are involved in credit projects are paid fair living wages for the work they conduct and for those selling credits to explicitly transparently state whether or not this is the case. One key means of doing may be through ensuring that waste picker associations, who represent the interests of waste pickers, are engaged and involved in the process from inception.

Additionally, a requirement could be introduced so that in addition to a wage, waste pickers receive other employment benefits like health benefits and insurance – though this would involve formalising their work, and would depend on the context of each country.

Due to the fact that the majority of plastic credit projects are located in the Global South, it is vital that, whether acting as a compliance mechanism or as a voluntary mechanism, the focus should be on designing a system that seeks to both incorporate and supports the informal sector (waste pickers) and does not exclude them. Examples include the practice of the inclusion of the informal waste sector within the EPR scheme in Brazil.

[129] It should be noted that the inclusion of the informal waste sector in the waste management system is a widely debated topic, not just in relation to plastic credits.

Appendix

A.1.0 Plastic credit terms and definitions

Terminology used within the plastic credit market varies significantly between organisations. Below is a consolidated summary of the most common terminology used by plastic credit organisations and their general definitions.

Term	Definition
Additionality	The concept that a project or activity, and thus the environmental and social benefits that result from these activities, would not have occurred without intervention. In the case of plastic credits, it is used to determine whether the plastic waste collection/reduction (e.g., plastic pollution reduction) is truly additional to what would have happened under a business-as-usual scenario.
Co-processing	Tends to be a form of waste-to-energy recovery, which involves burning plastic waste to generate alternative fuels.
Funding mechanism	A financial tool/method used to generate revenue for specific projects.
Market platform	A tool designed to connect project developers with buyers. Market platforms can be used by project developers to list and promote their projects, whilst buyers can use them to search and select projects to fund/purchase credits from.
Ocean Bound Plastic (OBP)	Plastic destined for the ocean (there is significant debate around what is defined as 'ocean bound' and no single global definition exists to characterise this).

Packaging Recovery Note (PRN)	A certificate to evidence that a certain weight of packaging has been recovered and reprocessed or exported for reprocessing. This is specific to the UK's system that is now changing to one based on full cost recovery.
Plastic credit	A certificate representing a specified weight of plastic collected, recycled and/or recovered by an organisation.
Plastic credit scheme	A system under which plastic credits are certified, generated and issued (e.g. Verra's Plastic Program).
Plastic credit standard	A set of guidelines and criteria used to certify and verify plastic credits. These are created within a plastic credit scheme (e.g., Plastic Waste Reduction Standard forms part of Verra's Plastic Program).
Plastic neutrality	The removal and/or treatment of an equivalent weight of plastic waste as is produced and/or distributed by a company. It should be noted that this definition varies frequently between organisations.
Plastic offset	The removal and/or treatment of a specified weight of plastic weight in relation to plastic produced and/or distributed by a company. It should be noted that this definition varies frequently between organisations.
Project developer	An organisation that designs, implements and manages projects aimed at reducing plastic waste. These projects typically involve activities such as collecting and recycling plastic waste to generate plastic credits. This term is frequently used interchangeably with 'project proponent'.

A.2.0 Credit scheme descriptions

This appendix section provides greater detail on the processes and methodologies issued by the plastic credit schemes described in section 3.3.

A.2.1 PPRS by Verra

The plastic waste should be collected or diverted from the environment, landfill, open burning, incineration with or without energy recovery, households and/or commercial entities or any other waste management operation that does not allow for the second life of plastic waste. Projects must also provide a baseline to demonstrate that plastic waste collection and/or recycling through the funding of plastic credits is in addition to the collection and/or recycling activities that were already in place, which is then assessed by the validation/ verification body (VVB). New projects can assume a baseline of 0.[130]

Projects may be issued with both Waste Collection Credits (WCCs) and Waster Recycling Credits (WRCs) for the same material where both the collection and recycling of the material is achieved by the project. These credits are characterised by a number of quality assurance principles which are confirmed through the project validation and verification process. Where feasible, projects that collect plastic waste should identify the material type(s) managed but are not required to do so. However, projects that recycle plastic waste are required to monitor and report on the material type(s) managed.[131] Under this scheme projects may be issued credits retroactively, meaning that they can sell credits for plastic waste collected and/or recycled in the period before registration, so long as it has been verified.

Verra provides the following program documents for plastic projects, which set out the requirements and methodologies of the Plastic Program:

- **Plastic Program Guide**[132]
  - Objectives, principles, and rules governing the Plastic Program
  - Process for registering a project and issuing Plastic Credits
- **Plastic Standard**[133]
  - Rules and requirements that projects must meet, including the scope of the program
  - Eligible project activities
- **Plastic waste collection methodology**[134]
  - Procedures for setting baselines
  - Procedures for demonstrating additionality
  - Procedures for quantifying plastic waste collected
- **Plastic waste recycling methodology**[135]
  - Procedures for setting baselines
  - Procedures for demonstrating additionality
  - Procedures for quantifying plastic waste recycled
- **Plastic Program Definitions**[136]
- **Plastic Program Fee Schedule**[137]
  - Costs and fees for registering with the Plastic Program

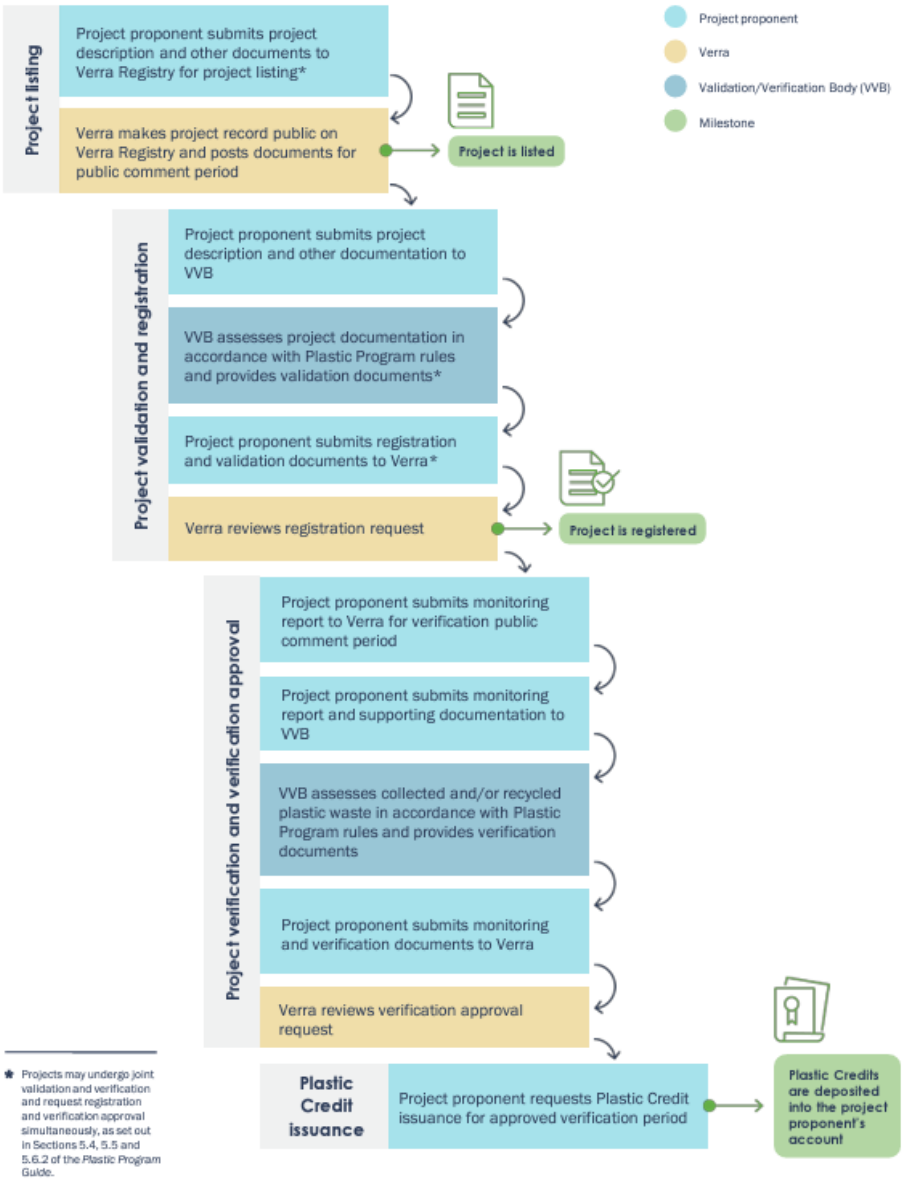
[130] Verra (2022) Plastic Waste Recycling Methodology, v1.1. Available at: Link
[131] Verra (2021) Plastic Program Guide, v1.0. Available at: Link
[132] Verra (2021) Plastic Program Guide, v1.0. Available at: Link
[133] Verra (2021) Plastic Standard, v1.0. Available at: Link
[134] Verra (2022) Plastic Waste Collection Methodology, v1.1. Available at: Link
[135] Verra (2022) Plastic Waste Recycling Methodology, v1.1. Available at: Link
[136] Verra (2021) Plastic Program Definitions, v1.0. Available at: Link
[137] Verra (2024) Plastic Program Fee Schedule, v1.3. Available at: Link

- Costs and fees for issuing Plastic Credits

Organisations wishing to register a project may do so independently as a project developer, or as part of a consortium of project developers. It is then their responsibility to provide the project description, monitoring report and supporting documentation for validation and verification. This documentation is then assessed by an approved VVB against the rules and requirements of the Plastic Program.[138] VVBs may employ the services of a local expert to assist in the auditing of a project, however they are not obliged to do so. Once the project has been validated by the VVB, the project developer is then able to request registration to the Plastic Program. Following project registration, all plastic waste collected and/or recycled is assessed by the VVB before credits can be issued. Any credits generated become the property of the project developer by default, and it is their responsibility to distribute the benefits to relevant stakeholders.[139] The project developer may sell credits through the Verra registry, and credits can only be transferred between accounts on this database.[140] Verra's full project lifecycle and registration process is outlined in Figure 4 below:

[138] Verra (n.d.) Validation and Verification for the Plastic Program. Available at: Link
[139] Verra (2021) Plastic Program Guide, v1.0. Available at: Link
[140] Verra (n.d.) Plastic Program Details: Plastic Credits. Available at: Link

Figure 4: Full project lifecycle and registration process for PWRS (Verra diagram)



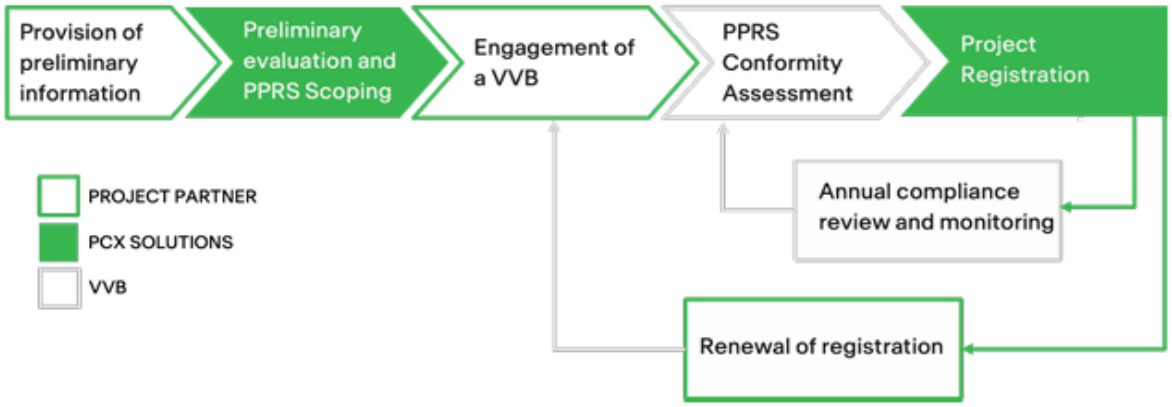
A.2.2 PWRS by PCX Solutions

To register a project, the project developer must first provide documentation demonstrating the project's process and technologies. Within this documentation, the PPRS standard suggests including a project scope, a process-flow-diagram, a process description and evidence for the use of calibrated equipment to weigh and monitor the plastic quantities. The next stage of project registration is demonstration of compliance with national/local environmental regulations, which is then validated by the VVB. The project developer must also provide documentation for an assessment of environmental risks and the steps taken towards mitigating these risks.

A key requirement of the PPRS is the demonstration of both quantitative and qualitative additionality, in which a baseline must be determined at the start of a project and at least once every 5 years to ensure that any 'socio-economic benefits and volumes claimed for plastic credits are incremental benefits to

the status-quo'.[141] The scope of this baseline may refer to either the national or sub-national level and is assessed by the VVB. The PPRS standard also includes social safeguards to ensure the protection of the local community, vulnerable groups, workers and any other relevant stakeholders. It is the responsibility of the VVB to conduct due diligence activities which includes stakeholder consultations and onsite validation. An overview of the project registration process is given in Figure 5 below:

Figure 5: Overview of the PPRS project registration process (PCX Solutions diagram)



Once a project has been approved by PCX Solutions, it is able to generate plastic credits using the following process:

1) Collection receipts are uploaded to the registry showing the location of collection, type of plastic and weight.
2) Processors upload receipts to the registry showing volumes, type of processing, and environmental compliance certificates.
3) 3rd party auditor verifies submission in the public registry.
4) Credit issued.

PCX Solutions only issues credits to transfer the ownership of credits from the project developer to the buyer, meaning issuance is only guaranteed after they have been purchased.[142] It is the responsibility of the project developer to establish the ownership of the plastic credit across the value chain, including through the provision of documents outlining the consent of all value chain stakeholders to the sale of credits by the project developer . Once a plastic credit has been sold, a **plastic credit certificate (PCC)** with details of the credit serial number is issued to transfer the ownership of the credit from the project developer to the buyer. This credit is then considered 'retired', meaning that it cannot be sold on to another organisation. PCX Solutions does not endorse the use of plastic claims by the buyer (e.g., plastic neutrality or plastic offset).

A.2.3 OBP by Zero Plastic Oceans

There are four certification standards under the OBP programme:

1) OBP Collection Organisation Standard (*for commercially recyclable Ocean Bound Plastic)*
    a. For organisations collecting Ocean Bound Plastic (OBP) or purchasing OBP from waste pickers, fishermen or small collectors
2) OBP Recycling Organisation Standard (*for commercially recyclable Ocean Bound Plastic)*

[141] PCX Solutions (2024) The Plastic Pollution Reduction Standard Version 8.0. Available at: Link
[142] PCX Solutions (n.d.) Module 4: Plastic Crediting Process. Available at: Link

    a. For organisations transforming certified OBP into new products (every recycling and manufacturing activity is considered in this this category, from after the collection until the final product)
    b. For organisations trading certified OBP material or products (at any stage of the value chain after collection)
3) **OBP Neutralization Services Provider Standard** *(for non-commercially recyclable OBP)*
    a. For organisations directly collecting or purchasing non-commercially recyclable OBP from waste pickers, fishermen or to small collectors and would like to issue/sell **Ocean Bound Plastic Credits** (OBP Credits). Of the four certification standards, this is the only one that generates plastic credits.
4) OBP Plastic Producers and Users Standard *(for non-commercially recyclable OBP)*
    a. For organisations purchasing OBP Credits and that would like to make a certified claim of OBP Neutrality.

A key differentiation is made between commercially recyclable plastic and non-commercially recyclable plastic:

- **Commercially recyclable plastic** refers to OBP waste that can be sold locally to recyclers for a price that renders its collection attractive to waste pickers or collection organisations.

- **Non-commercially recyclable plastic** refers to OBP waste that has no value to waste pickers or collection organisations as recyclers cannot sell it at a price that covers the cost of collection (or cannot be sold at all).

OBP credits are only issued by a certified project (to the OBP Neutralization Standard) once it has been verified by a certification body. Organisations which have been approved to certify projects are listed on the website and include:

- IGSC
- Control Union
- GSCS
- Trans Certification Inspection
- GCL International
- Qualitas Sertifikasi Indonesia
- ESTS[143]

Once the project developer has selected a certification body, they must demonstrate the following:

1. Legal compliance, fair working conditions and no use of child labour
2. Use of a quality management system to ensure compliance with the requirements
3. Identification of collection sites
4. Estimation of total annual OBP weight to be collected
5. Protocols and control processes for implementation and monitoring of the project
6. Protocols and control processes for material inspection, preparation and the use of a supply chain model
7. Identification of sub-contractors for recycling (optional)
8. Annual summary of weight and destination of collected OBP
9. Compliance with OBP trademarks and label uses requirements (optional)

When a project developer wants to issue and sell credits, they must submit a request to their certification body for a **neturalisation certificate**. The OBP Certification Program does not allow for forecasted or estimated plastic credits, and credits can only be issued once the evidence of the work done has been

[143] Zero Plastic Oceans (n.d.) Certification Bodies. Available at: Link

verified. The certification body then assesses the evidence and submits a request for validation from ZPO, who issues a serial number and registers the credits on the public registry.[144] [145]

ZPO does not have its own market platform to sell credits, and most registered project developers sell their credits directly. ZPO also allows for the trading of credits, meaning once a credit is sold it is not necessarily retired. ZPO provides the following list of organisations, which are authorised to re-sell and trade plastic credits:

- ClimeCo
- Seven Clean Seas
- WasteReduction
- Removall Plastic
- Climeto

A.2.4 CCM by BVRio

The CCM project cycle is as follows:

1. Completion of the project registration form, including a description of the project activities, a baseline assessment of the region prior to project commencement, expected project benefits and the monitoring plan
2. Analysis and registration of the project registration form by BVRio, including an estimation of the amount of credits generated
3. Implementation of project activities and monitoring of results, including updating the estimated amounts of credits generated
4. Negotiation and transaction of credits, in which CAH will assist the project developer and the buyer to come to an agreement
5. Verification of the results of the project by a verification body contracted by the buyer
6. Transfer of credits to the buyer
7. Retirement of circular credits once credits are used for a claim and reporting to CAH so this can be reported in the public registry

To ensure that a project is additional, a baseline assessment is performed in which both social and environmental indicators are assessed.

A.3.0 Market overview of credit schemes

This section gives a more detailed insight into the number of organisations and projects registered, and credits sold under each scheme. This appendix section relates to the market overviews provided in section 3.3.

A.3.1 PWRS projects

The Plastic Waste Reduction Standard (PWRS) is operated by Verra. The data reported in this section is taken from Verra's online PWRS registry[146].

[144] Zero Plastic Oceans (2021) OBP Neutralization Services Provider Standard. Available at: Link
[145] Zero Plastic Oceans (n.d.) Registry. Available at: Link
[146] Verra (2024) Registry. Available at: Link

Projects registered: At the time of writing[147], Verra has registered a total of 13 projects[148] under the PWRS, which together have collected/recycled a combined total of 98,876 tonnes of plastic. These 13 registered projects are located across 11 countries: 2 projects in Ghana, 2 in Indonesia and 1 in each of Thailand, Kenya, Ivory Coast, Senegal, Egypt, the Netherlands, Iceland, USA and Australia. Of these 13 projects, 8 have been issued credits and 5 have not yet. The following table outlines the name of each project, the project developer , country, project registration date, and the types of materials collected:

Table 5: Projects Registered under the PWRS standard

Project Name	Project Developer	Country	Project Registration Month & Year	Material Type
Upsyde: Producing Durable Goods From Hard-To-Recycle Plastic Waste	Braskem Netherlands B.V.	Netherlands	May 2024	Composite material
Ghana Plastic Waste Recovery and Recycling Project	Terra Carbon Pty Ltd (GreenCollar)	Ghana	Jun 2024	HDPE; LDPE; PET; PP
Batam Ocean Impact Project	Seven Clean Seas Pte. Ltd.	Indonesia	Mar 2024	Composite material
Project STOP	PT Systemiq Lestari	Indonesia	Feb 2024	Composite material
Pure North: Sustainable Plastic Recycling in Iceland	Pure North Recycling ehf	Iceland	Mar 2024	PP
VeryNile - Nile River Cleaning Plastic Offsetting Program	Bassita for General Consulting (VeryNile)	Egypt	Jun 2024	EPS; HDPE; LDPE; PET; PET bottle; PP; PVC
ASASE Foundation Community-based Collection and Recycling Project	ASASE Foundation	Ghana	May 2024	HDPE; LDPE; PET; PP
Plastic Waste Recycling & Improving Waste Picker Livelihoods in Kenya	Multiple Developers	Kenya	Jun 2024	HDPE; LDPE; PP
Conceptos Plásticos - The WaY Cote d'Ivoire	Conceptos Plásticos Cote d'Ivoire S.A.S.	Cote D'Ivoire	Aug 2023	Flexible material
IntegriCo - Production of Composite Timbers from Plastic Waste (Sarepta)	IntegriCo Composites Inc	United States	Apr 2024	Composite material
Deekali Plastic Recovery West Africa: Recycling, Reuse and Community Action	Africa Carbon and Commodities SARL	Senegal	Jun 2023	PP

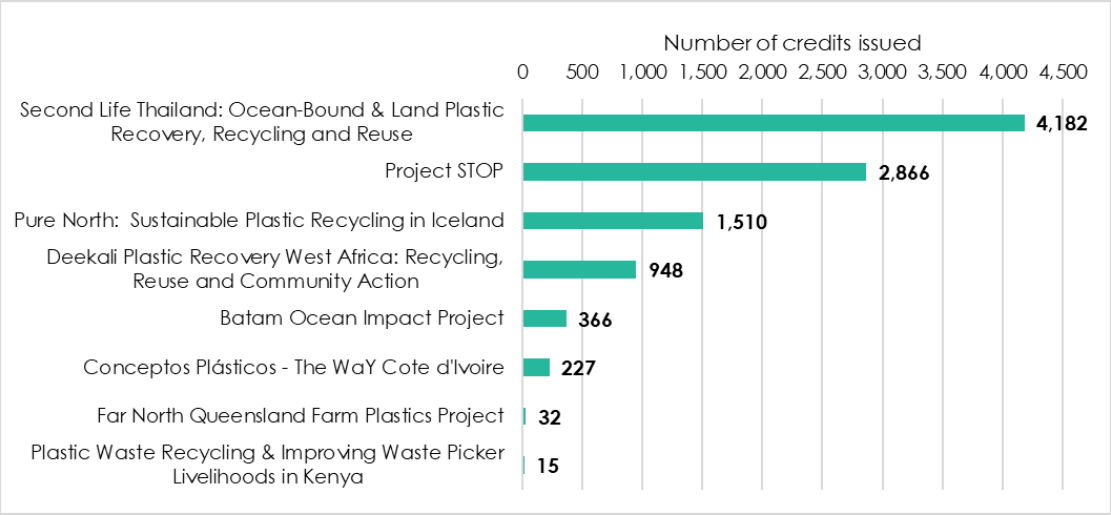
[147] 23rd July 2024

[148] ASASE Foundation Community-based Collection and Recycling Project (Ghana), Batam Ocean Impact Project (Indonesia), Conceptos Plásticos - The WaY Cote d'Ivoire (Ivory Coast), Deekali Plastic Recovery West Africa: Recycling, Reuse and Community Action (Senegal), Far North Queensland Farm Plastics Project (Australia), Ghana Plastic Waste Recovery and Recycling Project (IntegriCo - Production of Composite Timbers from Plastic Waste, Sarepta (USA), Plastic Waste Recycling & Improving Waste Picker Livelihoods in Kenya (Kenya), Project STOP (Indonesia), Pure North: Sustainable Plastic Recycling in Iceland (Iceland), Second Life Thailand: Ocean-Bound & Land Plastic Recovery, Recycling and Reuse (Thailand), Upsyde: Producing durable goods from hard-to-recycle plastic waste (Netherlands), VeryNile - Nile River Cleaning Plastic Offsetting Program (Egypt)

Far North Queensland Farm Plastics Project	Terra Carbon Pty Ltd (GreenCollar)	Australia	Apr 2023	Flexible material
Second Life Thailand: Ocean-Bound & Land Plastic Recovery, Recycling and Reuse	Second Life	Thailand	Mar 2022	Other Plastics

Credits issued: These 8 projects have been issued a combined total of 10,146 credits (equivalent to 10,146 tonnes of plastic collected/recycled), as shown in Figure 6Figure 6 below.

Figure 6: Number of credits (tonnes equivalent) issued to each project

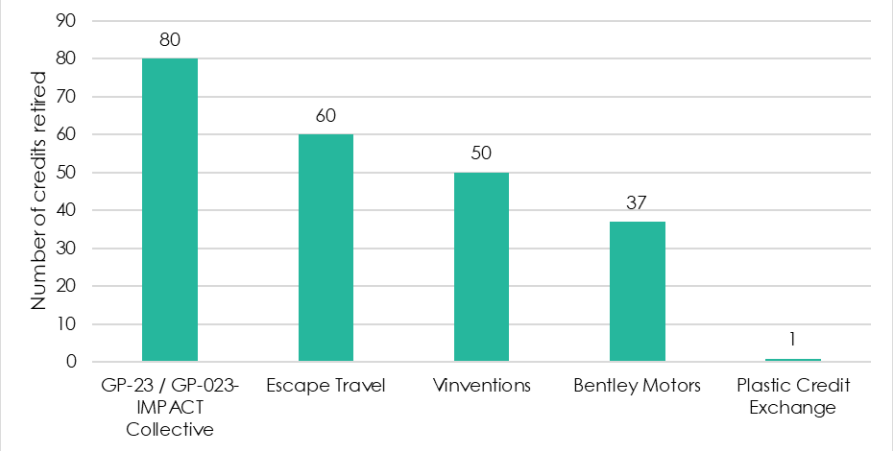


4 of these projects are "Plastic Waste Collection" projects, 1 is a "Plastic Waste Recycling" project, and 3 are both "Plastic Waste Collection and Recycling". The 10,146 credits issued to the 8 projects so far have the following characteristics:

- The average time it took these credits to be issued (between the vintage end date and the credit issuance date) was 1.4 years.
- A total of 76% of these credits were Waste Collection Credits (WCCs) and the other 24% were Waste Recycling Credits (WRCs).
- In terms of material type of the material collected/recycled, a total of 41% of the credits issued were issued for materials listed as "other plastics", 32% for "composite material", 24% for "PP", 3% for "flexible material" and just 0.1% as "HDPE; LDPE; PP".
- 100% of the credits issued for "composite material" and "flexible material", and 93% of the credits issued for "other plastics" were WCCs. The vast majority of these types of materials to date have therefore been issued WCCs rather than WRCs.
- 87% (2,142) of the 2,463 WRCs that have been issued, meanwhile, have been issued for PP, with the remaining 13% to "other plastics" and a mixture of "HDPE/LDPE/PP".

Credits sold: However, only 228 of these have been retired (sold), which is just 2.2% of the total. The chart below shows the six companies that have bought these credits and how many each has bought:

Figure 7: Number of PWRS credits bought by company



The language used when these purchases are made are often "environmental benefit" as the "retirement reason", and "plastic footprint mitigation" as the "retirement details".

A.3.2 PPRS projects

The Plastic Pollution Reduction Standard (PPRS) is operated by PCX Solutions. PCX Solutions do not currently have a PPRS registry available online which contains the full list of PPRS certified projects and the full list of PPRS credits issued to these projects, that can be downloaded by users (like for example Verra do). Therefore, at the time of writing, it relies on the user navigating to the PCX Marketplace[149] and then under the Accreditation Standard drop down box, selecting PPRS as a filter, to see the full list of PPRS projects.

However, PCX have confirmed in communications with the project team that they "will soon publish an own PPRS registry which is in the final stages of development, which will show all PPRS projects and all PPRS credits issued under those projects."

The full list of credits sold on PCX Marketplace, meanwhile, can be viewed by navigating to the PCX Markets online registry[150] and clicking into each individual transaction to find out which project the credit buyer bought credits from, and certified to what standard. Analysis of these projects can be found in section 3.4.1.

At the time of writing[151] there are 29 PPRS projects listed on the PCX Marketplace website – 14 of which are co-processing projects, 11 are recycling projects and 4 are upcycling projects. The term "co-processing" is used to describe 'a form of waste-to-energy recovery', which involves burning plastic waste to generate alternative fuels.

The above would seem to indicate that around 50% of the projects use "co-processing" to dispose of waste. However, according to PCX Solutions, in 2023, 68% of recycling projects used "co-processing" to dispose of waste (excluding collection only projects).[152] According to Source Material, meanwhile, just 14% of credits are generated from recycling while the remainder (86%) comes from 'co-processing'.[153]

[149] PCX Markets (2024) PCX Marketplace. Available at: Link.
[150] PCX Markets (2024) Registry. Available at: Link
[151] 24th July 2024
[152] PCX Solutions (2024) Real Impact Report 2023. Available at: Link
[153] Source Material (2023) 'Get Out of Jail Free': How plastics offsetting is giving industry a licence to pollute. Available at: Link

A.3.3 OBP projects

The Ocean Bound Plastics (OPS) standard is operated Zero Plastic Oceans (ZPO).

Projects certified: The OBP website[154] contains a list of organisations holding a valid OBP certification. At the time of writing[155], there were 178 entries listed as holding a valid OBP certification. It is important to note these are the number of entries rather than the number of projects/companies, since companies can have more than one entry (e.g. Green Worms, a project developer in India, are listed twice, as an OBP Collection Organization, and as an OBP Neutralization Services Provider). The **9 companies** certified as OBP Neutralization Services Providers, the type of certification that allows companies to sell credits, are Plastic Fischer India Private, Seven Clean Seas, Dalmia Polypro Industries, Heng Hiap Industries, Nirmal Vasundhara, Gemcorp Recycling And Technologies, Green Worms Eco Solutions, Tontoton Co. and Ocean Recovery Group. Each row of data (listed organisations) contains the company name, country, certification number, the certification standard under the OBP programme to which they are certified, the certification date, the date up until which the company's certification is valid (i.e. their expiry date, which is one year), and a link to an online copy of their certificate. However, there appears to be no option to download this data in one single file, in the same way as is possible for the Verra (PWRS) projects, therefore detailed analysis has not been able to take place so far for these.

Recycled OBP suppliers: The OBP website[156] also contains a list of organisations that are interested in selling "certified Ocean Bound Plastic or related products" and to contact them directly given that ZPO is not involved in the commercialisation of certified OBP products. Though related, this does not refer to the list of companies that are selling plastic credits – those appear to be the six companies listed below under "OBP credit suppliers". At the time of writing[157], there were 30 companies listed here, including organisations such as Plastics for Change and Green Worms. This therefore appears to fulfil the role of a market platform in a similar way to the market platforms outlined in section 3.4. Each row of data (company) contains the company name, their country, their offered product (polymer type, material and format) and contact details.

OBP credit suppliers: The OBP website[158] also contains a list of organisations that are interested in selling "Ocean Bound Plastic Credits" and to contact them directly given that ZPO is not involved in the commercialisation of certified OBP products. This part of the website currently lists **6 companies**: Seven Clean Seas, Heng Hiap Industries, TONTOTON, Green Worms, Ocean Recovery Group and Gemcorp Recycling & Technologies Private Limited.

Authorized traders: The OBP website[159] also contains a list of organisations that "are allowed to re-sell and trade Ocean Bound Plastic Credits". This part of the website currently lists **5 companies**: ClimeCo, Seven Clean Seas, Waste Reduction, Removall Plastic and Climeto Sustainable Services. These could then be interpreted as either project developers themselves or brokers helping project developers sell the credits they are issued.

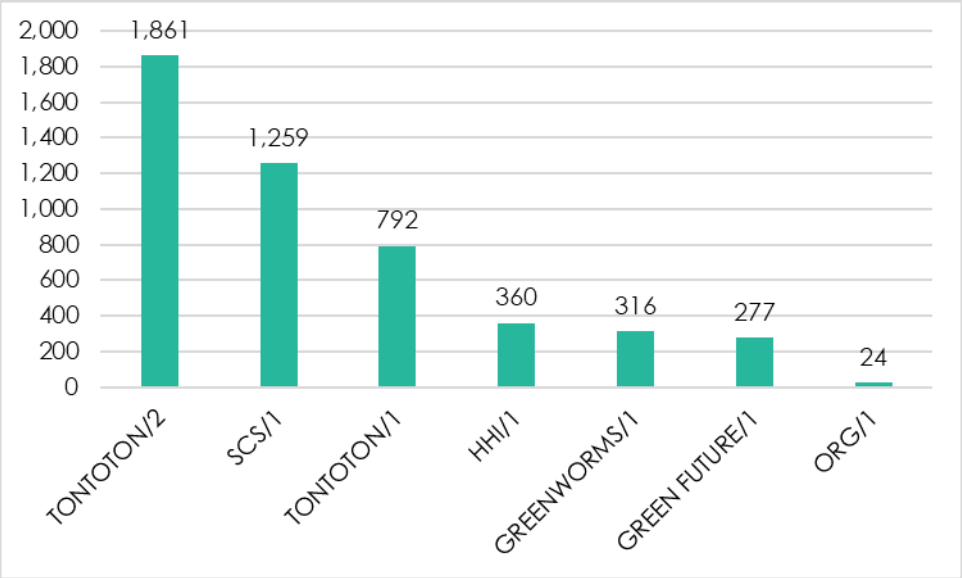
Credits issued: In addition to the above, their online registry[160] contains information on the credits they have issued. This information is split as follows:

OBP Credits Issuance**:** This contains a list of credits issued to projects to date. At the time of writing[161], **71 Credit batches**, totalling **4,890 tonnes** equivalent of credits, had been issued to **7 projects**. OBP Credit batches are issued "after a verification by the certification body which ensures the work was effectively

[154] OBP (n.d.) Certified Organizations. Available at: Link
[155] 24th July 2024
[156] OBP (n.d.) Recycled OBP suppliers. Available at: Link
[157] 24th July 2024
[158] OBP (n.d.) OBP credit suppliers. Available at: Link
[159] OBP (n.d.) Authorized traders. Available at: Link
[160] OBP Certification (2024) Registry. Available at: Link
[161] 24th July 2024

performed". Each row of data (credits issued) contains an issuance date, batch serial number, issuing project ID, the quantity of credits and a link to an online copy of their neutralisation certificate. There currently appears to be no option to download this data in one single file, in the same way as is possible for the Verra (PWRS) projects, and therefore this needs to be done manually. The 7 projects that have been issued credits to date, and the number of credits each has been issued with is shown in Figure 8 below.

Figure 8: Number of credits (tonnes equivalent) issued to each project



OBP Credits Retirement**:** Once OBP Credits "reach the final beneficiary (the organisation that will use them to offset their plastic footprint), the OBP Credits are retired." From this point on, they cannot be traded or used anymore. This section of the website lists the credits retired to date. Each row of data (credit retirement) contains a retirement date, the serial number block retired, who these credits were retired by, the retirement beneficiary (with a note saying the beneficiary may wish to remain anonymous, in which case the retirement beneficiary information is not published) and the retirement details. At the time of writing[162], 228 transactions (credit retirements) had taken place. However, there appears to be no option to download this data in one single file, in the same way as is possible for the Verra (PWRS) projects, therefore detailed analysis has not been able to take place so far for these.

A.3.4 CCM projects

The Circular Credits Mechanism (CCM) standard is operated by BV Rio. However, unlike Verra, PCX and ZPO, they do not have an online registry where they publish the full list of projects certified to their CCM standard, nor the credits that have been issued to CCM projects. This is a transparency issue that should be addressed.

The Circular Action Hub platform, also operated by BV Rio, however, does publish their project registry and credit transactions registry, though this platform showcases projects and sells credits for projects which are not exclusive to the CCM standard, and it does not show which of these projects are CCM projects, therefore there is no way of accessing the full list of CCM projects. Information on projects listed on the CAH website is outlined in section 3.4.2.

[162] 24th July 2024

A.4.0 Market platforms selling credits

A.4.1 PCX Markets (by PCX)

PCX Markets[163], the sister company of PCX Solutions, is an online market platform for the sale and acquisition of credits issued by both the PPRS scheme (operated by PCX Solutions) and credits issued by other schemes such as PWRS and OBP. Parties who are interested in purchasing plastic credits can visit the PCX Marketplace website[164], where they can see all of the plastic credit projects which have been issued credits and are offering them for sale online (i.e. looking for a buyer). Users who click onto the website can see the project name and the price (in $ per credit) at which the credits are being sold by each project. The prices are set by the projects/project developers themselves (or another entity advising the projects) and not PCX Markets.

Interested buyers can filter by country (at the time of writing[165], ten different countries), plastic type (ten different types)[166], processing type (recycling, upcycling[167], co-processing, collection only or chemical recycling), accreditation standard (PPRS, PWRS, or OBP) and price (where they can specify the minimum and maximum price they are willing to pay), as well as project tags if they are looking for a specific type of project/credit or social angle (such as "empowering women", "community collection" or "collecting ocean-bound plastics").

Once users click on a project they are interested in, more information on that project is displayed, including a project description, annual capacity (in metric tonnes), what type of clean-up it is, the vintage year of the credit (when the credit was generated), the location, the plastic type, the processing type and the standard applied.

PCX Marketplace data[168]

The following data is taken directly from the PCX Marketplace website. At the time of writing[169], there were 35 projects selling credits listed on the website. The details of these are shown below. It must be noted that the numbers changing frequently as the market develops, so is only accurate at the time of writing, and is intended to give an overview.

Projects certified to each standard

Table 6: Credit standard

Standard	Number of projects	% of projects
PPRS (PCX Solutions)	29	83%
PWRS (Verra)	4	11%
OBP (ZPO)	2	6%

Processing type

[163] PCX Markets (n.d.) Homepage. Available at: Link
[164] PCX Markets (2024) PCX Marketplace. Available at: Link
[165] 24th July 2024
[166] LDPE, HDPE, PET, PP, PS, PVC, Other/Mixed, Used Tires, PE, Nylon
[167] The PPRS defines this as the 'Process of converting waste products to new materials that are of higher economic value or quality than in the original product'.
[168] PCX Markets (2024) PCX Marketplace. Available at: Link
[169] 24th July 2024

Table 7: Processing type

Processing type	Number of projects	% of projects
Co-processing[170]	14	40%
Recycling	11	31%
Upcycling	5	14%
Collection only	4	11%
Chemical recycling (pyrolysis)	1	3%

The most common processing type is co-processing, where projects send collected plastic waste to a form of waste-to-energy recovery, which involves burning plastic waste to generate alternative fuels, or directly burning plastic in cement kilns.

In addition:

- **Project location:** A total of 16 (46%) projects advertised are located in the Philippines, 8 (23%) in India, and the other 11 (31%) are in Argentina, Indonesia, Thailand, Vietnam, Nigeria, Cambodia, Ivory Coast and Malaysia.

- At the time of writing, the **credit prices** ranged from the cheapest at $106/credit to the most expensive at $804/credit, with an average price[171] of $360/credit (one credit in the PPRS standard is equivalent to one tonne of plastic and this unit has been used for all credits to allow for comparability).

- The credits being sold by the four Verra PWRS projects were all priced $534/credit and above, those sold by the two OBP projects $359/credit and above, whereas the PPRS credits ranged from $106/credit to $804/credit.

- The average price of credits sold by projects located in the Philippines was $216/credit, whilst in India they were $386/credit.

- The co-processing credits are cheapest at an average of $260/credit, followed by recycling credits at $337/credit, upcycling credits[172] at $461/credit and collection-only projects at $647/credit. The one chemical recycling project is selling its credits at a price of $359/credit.

- There appears to be some relationship between the annual capacity of the project and the credit price, with the average price of the 24 projects with an annual capacity of under 10,000t being $452/credit, compared to $159/credit for those 11 projects with an annual capacity above 10,000t.

- The **annual capacities** of the projects ranged from very small projects at 10 metric tonnes/year to very large ones at 100,000 tonnes/year, with the average capacity being circa15,000 tonnes/year.

- **Types of plastics**: The types of plastics for which credits are being sold include any combination of PET, HDPE, LDPE, PP, PVC, PE, PS, multi-layer plastics, "other mixed" and used tires.

[170] A form of waste-to-energy recovery, which involves burning plastic waste to generate alternative fuels
[171] Not accounting for size of project.
[172] Upcycling credits are certificates issued to plastic projects which treat plastic waste through repurposing discarded plastic in order to create a new product.

- **Sale of credits**: At the time of writing, 3 of the projects appear to have sold out of all their credits, though it must be noted these are all smaller projects, with annual collection/ processing capacities of 140 tonnes and under.

Though just 40% of the projects by number are "co-processing" projects, by annual capacity "co-processing" projects account for 75% (396,120 metric tonnes) of the combined annual capacity of all projects. 24% of the remaining capacity is from "recycling" projects and 1% from "upcycling", "collection only" and "chemical recycling" projects.

PCX Registry of Transactions data[173]

Though the Registry of Transactions is not yet available to be downloaded in one single file online (and therefore has to be done manually), the PCX Markets team shared this data with the project team. This Registry of Transactions shows the date the credit was issued/purchased, the transaction ID, the name of the credit buyer, the location of the buyer, the number of credits issued/purchased, the purpose of the purchase (to comply with EPR or for voluntary purposes), whether the purchase is to claim a Net Zero Plastic Waste (NZPW) claim or not, and the credit serial number.

Between 2020 and 2024, at the time of writing, a total of 409 transactions have been registered on the PCX Markets website, totalling over 100,000 tonnes of plastic waste credits purchased. Of these:

- Around 41,000 (41%) have been purchased for the purpose of complying with EPR, and 60,000 (59%) for voluntary purposes.

- The vast majority (95,000, or 94%) have been purchased by buyers located in the Philippines, 3,000 (3%) by buyers in Singapore, and 2,300 (2%) by buyers in the USA. Other buyer locations include Vietnam/Thailand (201), UK (45) and Switzerland (1). This is consistent with PCX being set up primarily for the Philippines' market, to help companies that are regulated by EPR in the country to comply with their obligations.

- All of the buyers who purchased credits on the PCX Markets platform who are located outside the Philippines bought them for voluntary purposes.

- Around 33% of the purchases were made with Net Zero Plastic Waste (NZPW) claims, i.e. plastic neutrality. However, as stated in section 4.1.2, in March 2024 PCX Solutions announced a transition away from this NZPW certification, stating that "while the methodology we used to certify the Net Zero claims is robust and sound, there is no global consensus as yet on the terminology and methodology for Net Zero." The company go on to say that "since the NZPW certification came with a 3 year commitment, the NZPW label may continue to appear on some of our partners' packaging as we make this transition."[174]

Buyers

The top 10 buyers of credits on the PCX Markets website are shown in Table 8 below.

Table 8: Buyers of credits on the PCX Markets website

Buyer	Credits bought (t)
NutriAsia Inc.	26,617
Century Pacific Food, Inc.	15,435
Monde Nissin Corporation	12,708

[173] PCX Markets (2024) PCX Registry. Available at: Link
[174] PCX Markets (2024) The Plastic Cleanup Partner Program. Available at: Link

Nestlé Philippines, Inc.	7,888
Colgate-Palmolive Philippines Inc.	3,685
Alliance to End Plastic Waste	3,000
Coca-Cola Beverages Philippines, Inc.	2,717
Mondelez Philippines, Inc.	2,707
San Miguel Foods	2,669
Wyeth Philippines, Inc.	2,095

Transparency gaps:

- The Registry of Transactions does not yet have the functionality to download the full list in one single file. This is important as it allows users to be able to access the full list of information they require. However, PCX have confirmed in communications with the project team that "they continue to evolve the registry to make it more accessible, and this is on their roadmap."

- The Registry of Transactions list (which was shared with the project team by PCX) does not show the following, instead requiring clicking into each individual transaction manually:
    - The credit standard used by each project from which the purchase was made (e.g. whether PWRS, PPRS or OBP)
    - Collection source
    - Processing type
    - Plastic type
    - Price

- The Registry of Transactions does not show the price paid for each credit purchase (not even by clicking into each individual transaction manually).

A.4.2 Circular Action Hub (by BVRio)

The Circular Action Hub (CAH)[175] is a platform for the sale of waste credits, established and operated by BV Rio. The platform sells credits certified to BV Rio's CCM standard, but also sells credits certified to the PWRS (Verra) and OBP (Zero Plastic Oceans) standards. It therefore serves as a platform for all three credit standards.

Registered projects listed: At the time of writing[176], CAH's "Project Registry"[177] lists a total of 132 projects across 44 countries, with Brazil and India having by far the most projects at 31 each, followed by Indonesia with 8. This figure, however, differs slightly from their "Projects List"[178], which lists 127 projects. There is no detail, however, on their registry on how many of these projects are CCM, PWRS and OBP projects.

Of these 127 projects, **103** are **plastic projects**, with the other 24 covering materials such as paper, beverage cartons, glass, metals, tyres, e-waste, medical waste, and "other".

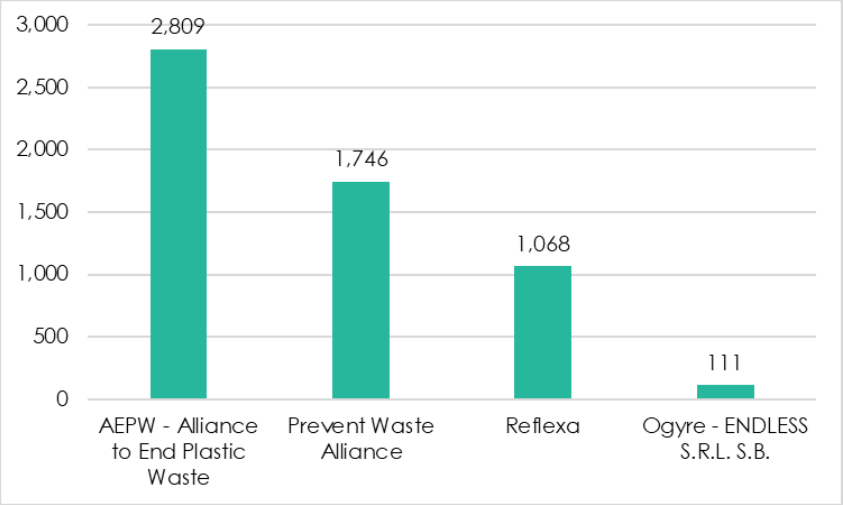
Credits issued: Of the 132 projects on the project registry, only 14 have had their collection volumes verified and have therefore been issued credits. All of these 14 projects except for one (in Mexico) are located in Brazil. These 14 projects have been issued a combined total of 5,607 credits (equivalent to

[175] Circular Action Hub (n.d.) Homepage. Available at: Link
[176] 24th July 2024
[177] Circular Action Hub (n.d.) Projects Registry. Available at: Link
[178] Circular Action Hub (n.d.) Projects List. Available at: Link

5,607 tonnes), with the "Increasing selective collection in Rio with AEPW" project issued the most, at 2,787 credits. There is no detail, however, on their registry on how many of these projects are CCM, PWRS and OBP projects.

Credits sold: Of the 14 projects that have been issued credits to date, 13 of them have now sold all their credits, selling a combined total of 5,588 credits. All of the credits appear to be credits certified to the CCM standard. Only 1 project, the "Fishing for Litter – Rio de Janeiro (Ogyre)" project in Brazil, still has (20) credits available to buy.

Figure 9: Number of CCM credits bought by different organisations



A.5.0 Example projects

This section provides an overview of five examples of plastic credit projects, giving information on the scheme under which they are certified, whether they have been issued credits and if so, how many, their validation and monitoring processes, and reported community impacts. These example projects have been identified through stakeholder engagement and media presence. Whilst it was not possible to attain stakeholder input for every project listed, where stakeholders were consulted this has been referenced. Information has largely been gathered from project developer websites and articles.

A.5.1 TONTOTON

Certification standard: **Ocean Bound Plastic (OBP)**
Project location: Cambodia; Vietnam

Overview

TONTOTON is a project developer for plastic credit initiatives in Cambodia and Vietnam, although its operations are now mostly focused in Cambodia. The organisation follows the Ocean Bound Plastic (OBP) Neutralization standard - by Zero Plastic Oceans (ZPO) - and works with Control Union to audit its plastic collection. TONTOTON has registered 2 projects under the OBP program.

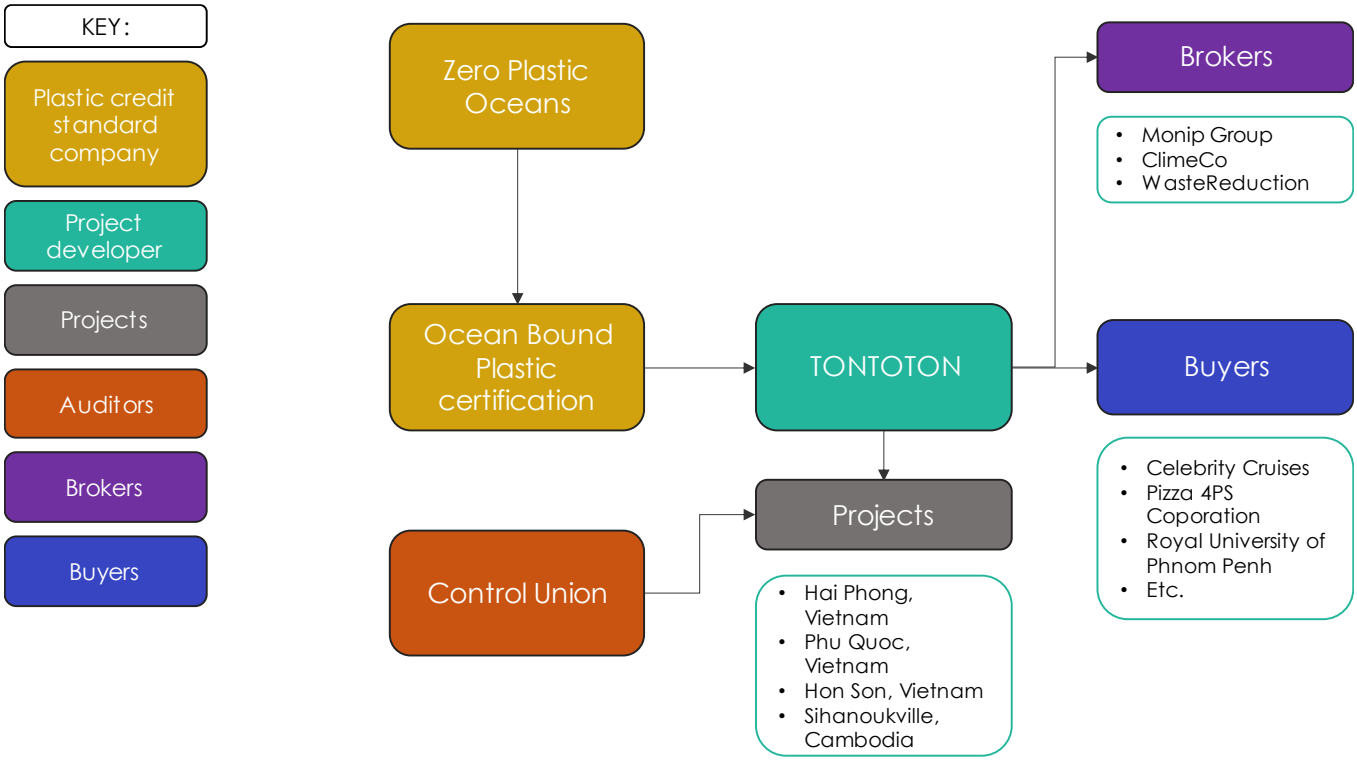
Collected recyclable and hard-to-recycle plastic is processed at its MRF in Sihanoukville, Cambodia, and the remaining non-recyclable plastic is sent to a cement kiln through their partner INSEE Eco-cycle. The

organisation has collected 2,721 tonnes of plastic to date[179] and generated 2,682,831 credits[180] (1 OBP credit = 1kg of plastic).

Plastic producers are able to purchase credits directly through TONTOTON. Plastic credits are also available for individuals to purchase through brokers such as ClimeCo, for $1.60 per kg[181] and through TONTOTON's impact product range which represent a kg equivalent of plastic collected and/or treated. These impact products are made of recycled materials which have been processed at TONTOTON's MRF and act as physical credits for individuals to fund plastic collection. Each product is labelled with a weight equivalent of plastic material collected and treated and are available to buy at various retailers. The products also display a barcode which provides access to a tool for tourists to calculate their plastic footprint whilst in Cambodia and educational materials for them to reduce their plastic consumption.[182]

An overview of the TONTOTON plastic credit lifecycle is given in Figure 10 below:

Figure 10: TONTOTON plastic credit lifecycle



Validation and monitoring

TONTOTON is certified by OBP and works with Control Union for auditing services. Once audited by Control Union, TONTOTON is issued a certificate declaring its accordance with the OBP Neutrality Standard, which remains valid for a year. Within this period, Control Union audits the plastic collection and treatment to verify its activities, which then leads to credit generation. It is not clear what the requirements are around frequency of audits for monitoring purposes, however TONTOTON has published neutralisation certificates on a roughly bi-annual basis.[183]

[179] TONTOTON (n.d.) Home. Available at: Link
[180] Ocean Bound Plastic Certification (n.d.) Registry. Available at: Link
[181] ClimeCo (n.d.) Restoring Communities in Vietnam and Cambodia. Available at: Link
[182] Interview with a project developer.
[183] Ocean Bound Plastic Certification (n.d.) Registry. Available at: Link

Community impacts

According to TONTOTON, it has sought to reinvest in the communities where it operates by "providing access to medical benefits, appointing community managers to work with families directly and renovating houses using upcycled plastic". [184] Such social initiatives are not required or outlined in the OBP Neutrality standard but are recognised in the Social+ OBP standard and according to ZPO play a significant part in addressing "the needs of informal collectors and usual social and ethical requirements for the organization's formal employees". [185] TONTOTON also provides education on responsible plastic use and disposal and has facilitated waste segregation within households in the villages where it operates.[186] Upstream interventions such as the education of local communities on the impact of single-use plastic can be just as, if not more effective in reducing plastic pollution, especially in the Global South, where separate collection largely does not exist,[187] and co-processing mixed waste can result in air pollution, odour and fire risk.

A.5.2 Seven Clean Seas

Certification standard: **Ocean Bound Plastic (OBP); Plastic Waste Reduction Standard (PWRS)**

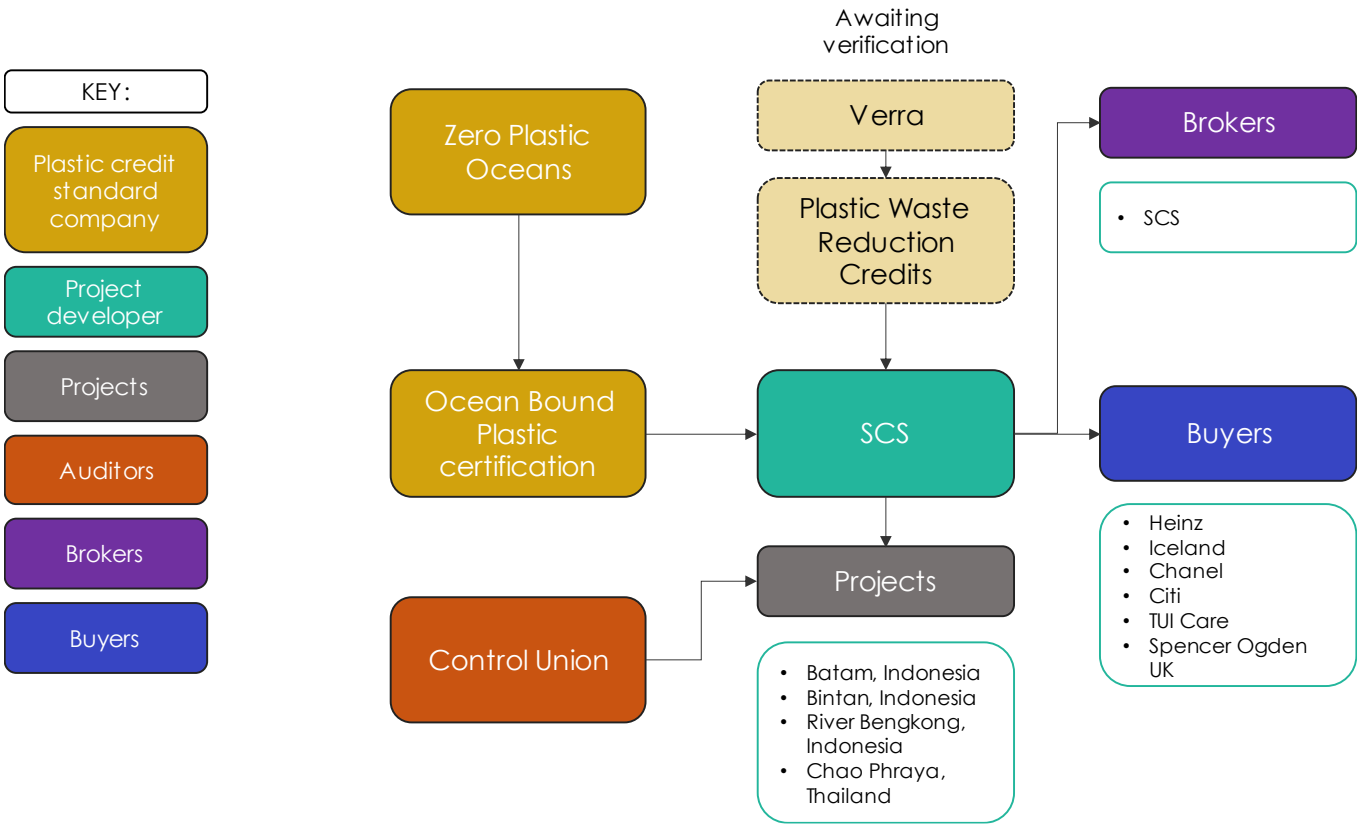
Project location: Indonesia; Thailand

Overview

Seven Clean Seas (SCS) operates 4 projects across Indonesia (Batam, Bintan Island and River Bengkong) and Thailand (Chao Phraya River). The projects are certified under the OBP Neutrality standard and have collectively accounted for 3,231 tonnes of plastic waste collected to date. 1,259,054 credits have been issued through the OBP Neutrality standard by ZPO and are for sale directly through SCS for $2 per 1kg. SCS is also in the process of obtaining verification from the Plastic Waste Reduction Standard by Verra, although it has already been issued 366 credits and has sold at least 100 Verra approved credits since November 2022.[188] An overview of the Seven Clean Seas plastic credit lifecycle is given in Figure 11 below:

[184] Interview with project developer.
[185] Ocean Bound Plastic Certification (n.d.) Social+ Ocean Bound Plastic. Available at: Link
[186] Interview with project developer.
[187] Interview with project developer.
[188] Verra (2024) Batam Ocean Impact Project. Available at: Link

Figure 11: Seven Clean Seas plastic credit lifecycle



Validation and monitoring

SCS is audited by Control Union, and under the OBP Neutrality programme is currently registered to generate credits until 11th January 2025. SCS is certified for 1574.4MT of plastic per year according to the most recent certification. SCS also provides monitoring services through its own platform 'Periscope', which provides transparency on quantities, type and location of plastic collected.[189] To date, SCS OBP credits have been retired by Heinz, Iceland, Chanel, Citi and others.[190]

Under the PWRS scheme, SCS is currently undergoing verification,[191] meaning that it has been registered and validated by its VVB and is now in the process of verifying its activities before it can be issued credits.[192] Despite this, SCS has been issued and sold credits under the Verra standard.[193] It is unclear whether this is due to a mistake on the project registry or inconsistencies in the PWRS methodology.

Community impacts

Seven Clean Seas has worked to integrate the informal waste sector into a formal framework by "giving them permanent formal employment that offers financial stability, job satisfaction, and social security such as healthcare, work accident, old age protection, and pension plan".[194] The organisation also works

[189] Seven Clean Seas (n.d.) Transparency. Available at: Link
[190] Ocean Bound Plastic Certification (n.d.) Registry. Available at: Link
[191] Verra (2024) Batam Ocean Impact Project. Available at: Link
[192] Verra (n.d.) Plastic Waste Reduction Standard. Available at: Link
[193] Verra (n.d.) Plastic Waste Reduction Program: Project and Credit Summary. Available at: Link
[194] Seven Clean Seas (2024) Waves of Social Impact at Seven Clean Seas. Available at: Link

to increase its social impact by providing employees with resources to improve their knowledge and skills. For example, a 2-day workshop was held for employees, "aimed at scaling up their financial literacy".[195]

A.5.3 Reciki

Certification standard: **Verra PWRS**

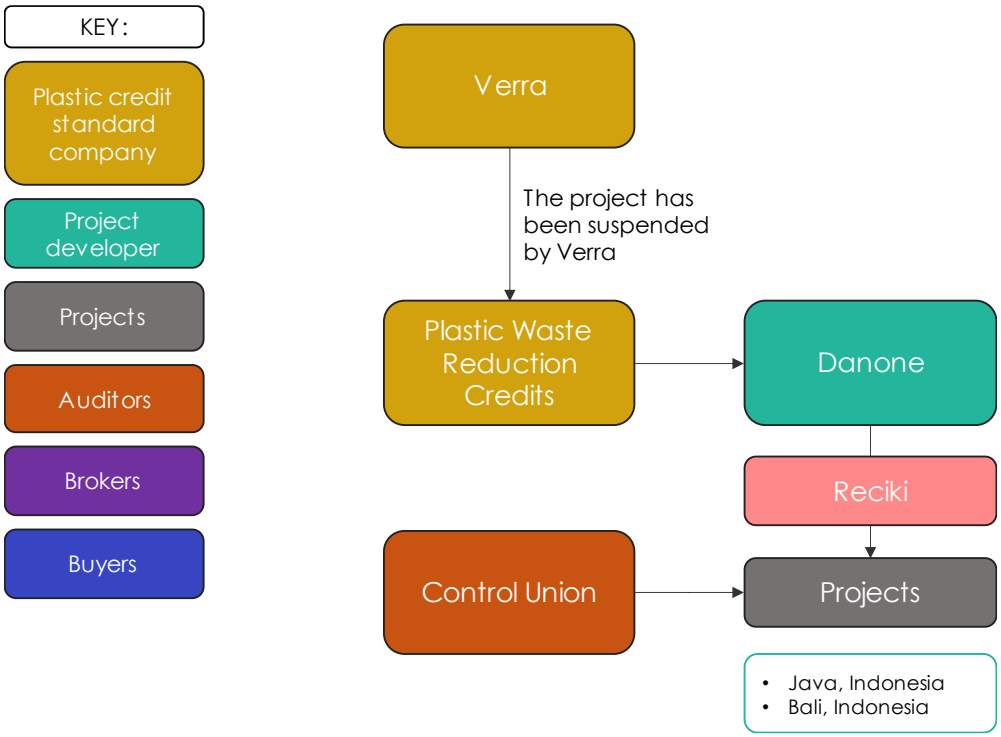
Project location: East Java & Bali, Indonesia

Overview

Danone, a French multi-national food corporation, worked alongside Reciki, a privately-owned waste management company based in Indonesia, and BVRio – who provided technical assistance – to develop a plastic credit project under the Waste Collection Credit (WCC) standard by Verra. The project sought to implement MRFs in Java and Bali to enhance the existing local waste infrastructure. Danone, as the project developer and main investor, was responsible for all external communication and led the stakeholder consultation process alongside Reciki, who were mostly responsible for daily project operations. In May 2023, Verra opened a quality control review following the receipt of complaints from stakeholders that one of the recycling facilities in Jimbaran was built too close to community housing. Plastic credit issuance has been suspended and Danone has now withdrawn from the project, handing it over to the local owners, Reciki.

An overview of the Reciki plastic credit lifecycle is given in Figure 12Figure 12 below:

Figure 12: Reciki plastic credit lifecycle



[195] Seven Clean Seas (2024) Waves of Social Impact at Seven Clean Seas. Available at: Link

Validation and monitoring

According to the project proposal issued on 28th September 2021, only 3 comments were received during the public comment window, all of which were positive in nature.[196] One complaint was received after the window was closed from Jane Fischer, the Coordinator at the Bali Waste Platform on behalf of a Bali resident, raising concerns over the proximity of the Jimbaran facility to local housing and the presence of a bad odour. The proposed actions to address these concerns were included in the proposal and the project was validated on 24th March 2022 by Control Union. On 24th May 2023 the project was suspended by Verra and a quality control review opened due to "substantiative comments from stakeholders about the Reciki project".[197]

Community impacts

Despite the positive nature of the comments received during the public comment period, the following complaints were received in an official capacity in 2021:

- Lack of community consultation within the Goa Gong, Bali residential community.
- Open flame burning and black smoke from RDF fuel prep machine.
- Leachate leakage into waterways.
- Possible dumping of excess supply into rivers.
- Complaint of bad smell.[198]

Additional complaints posted on social media include the following:

- Violation of road access permits.
- Lack of environmental monitoring documents.
- Lack of free and prior consent approval documents.[199]

Local stakeholders have suggested that Bali is not suited for co-processing facilities and instead more support is needed for waste reduction and separation at source.[200] This is because high volumes of mixed waste are entering these facilities and producing emissions and bad odours.

A.5.4 ASASE Foundation

Certification standard**: Verra PWRS**

Project location: Greater Accra Region, Ghana

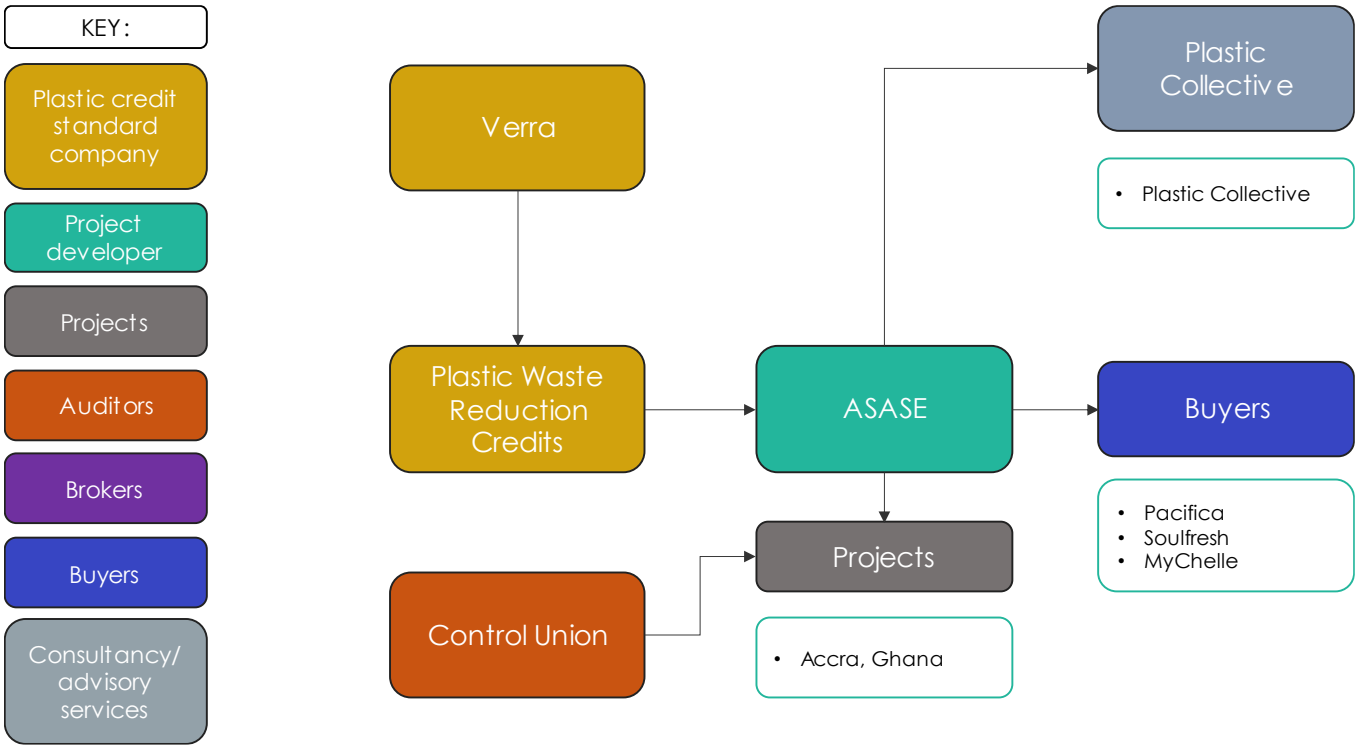
Overview

The ASASE Foundation (ASASE) was founded in Accra, Ghana in 2017 with the goal of providing a platform for underprivileged women waste workers to access fair employment opportunities. The project became registered with Verra's WCC and WRC programmes on 22nd May 2024. and involves establishing small recycling plants as social enterprises in communities facing severe plastic pollution. The project encourages women to run their own plastic waste collection businesses in order to achieve a sustainable stream of income. The collected waste is aggregated and sorted at ASASE's collection centres before being sent for washing and processing at their Cash It! Plants. ASASE worked with Plastic Collective for advisory services in becoming Verra registered and was sponsored by Alliance to End Plastic Waste.

[196] Verra (2021) Reciki: Valorization Of Waste, Systematic Diversion From Landfill And Leakage. Available at: Link
[197] Verra (2023) Project 2648: Quality Control Review Notification. Available at: Link
[198] Verra (2021) Reciki: Valorization Of Waste, Systematic Diversion From Landfill And Leakage. Available at: Link
[199] LinkedIn (2023) It's unknown if an environmental, social and governance assessment study was conducted before Danone invested into the waste processing and… Available at: Link
[200] Interviews with multiple research/consultancy organisations.

In January 2024, the World Bank issued a $100 million Plastic Waste Reduction-Linked Bond, which raises finances for two plastic projects, including ASASE Foundation.[201] The project funding does not come directly from the bond, but rather from the proceeds of the bond, whereby investors will forego (effectively donate) a portion of their ordinary coupon payments to the projects. Should the projects and monetisation of the credits perform above expectation, investors will receive an additional financial benefit. The actual funding available to the two projects is expected to be closer to $14 million.[202] It is not clear precisely how the investment has been, or will be, used by the projects, however according to the World Bank, financing from the bond will be used by ASASE to expand its collection and recycling capacity in Accra.[203] According to the Verra public registry, ASASE is expected to collect/recycle on average 7,900 tonnes of plastic per year until 2030.[204] An overview of the ASASE Foundation plastic credit lifecycle is given in Figure 13 below:

Figure 13: ASASE Foundation plastic credit lifecycle



Validation and monitoring

The ASASE Foundation uses Control Union for validation and monitoring services. The public comment period was open from 19/12/2022 to 18/01/2023, but no comments were received during this period. A monitoring report for the period 1st July 2021 to 31st October 2022 is available on the Verra registry.[205]

Community impacts

The ASASE Foundation (ASASE) is focused on "empowering women waste workers to earn sustainable incomes". The project has done so through the establishment of partnerships with local schools, where ASASE delivers teaching to students on waste management, segregation and recycling so that they can

[201] World Bank (2024) World Bank Outcome Bond Mobilizes Private Capital for Projects that Tackle Plastic Pollution. Available at: Link
[202] Citi Bank (2024) IBRD – $100mn Plastic Waste Reduction-Linked Bond. Available at: Link
[203] World Bank (2024) World Bank Plastic Waste Reduction-Linked Bond . Available at: Link
[204] Verra (2024) ASASE Foundation Community-based Collection and Recycling Project. Available at: Link
[205] Verra (2024) ASASE Foundation Community-based Collection and Recycling Project. Available at: Link

also help to collect and sort their own plastic waste, which is then recycled at one of their facilities. ASASE employs women, who are often discriminated against in their communities for working in the waste sector.[206] The ASASE Foundation has also partnered with the Design and Technology Institute in Accra to build career paths for young mechanics and engineers in the recycling industry.[207]

Areas of concern

One waste picker association interviewed, who operates in Accra, discussed how Verra and the ASASE Foundation had not involved them in the project, and no information had been communicated to them about how the project operates, what benefits credits will bring, nor how the project might change or improve working conditions for the waste pickers they represent. They then commented that the role of their association is to have an open and transparent conversation about how credits will impact their waste pickers, but that they were being bypassed. This asymmetry of information was pointed out as problematic, and an area that should be rectified, given the importance of the waste picker association in the area, and the need to involve them in the project process.

The interviewee also stated that the ASASE Foundation, instead of buying the collected plastics for onwards recycling directly from waste pickers, are buying them from middlemen and aggregators, who are therefore the ones benefitting the most. Waste pickers are therefore being excluded and not benefitting like they should.[208]

A.5.5 BVRio

Certification standard**: CCM**

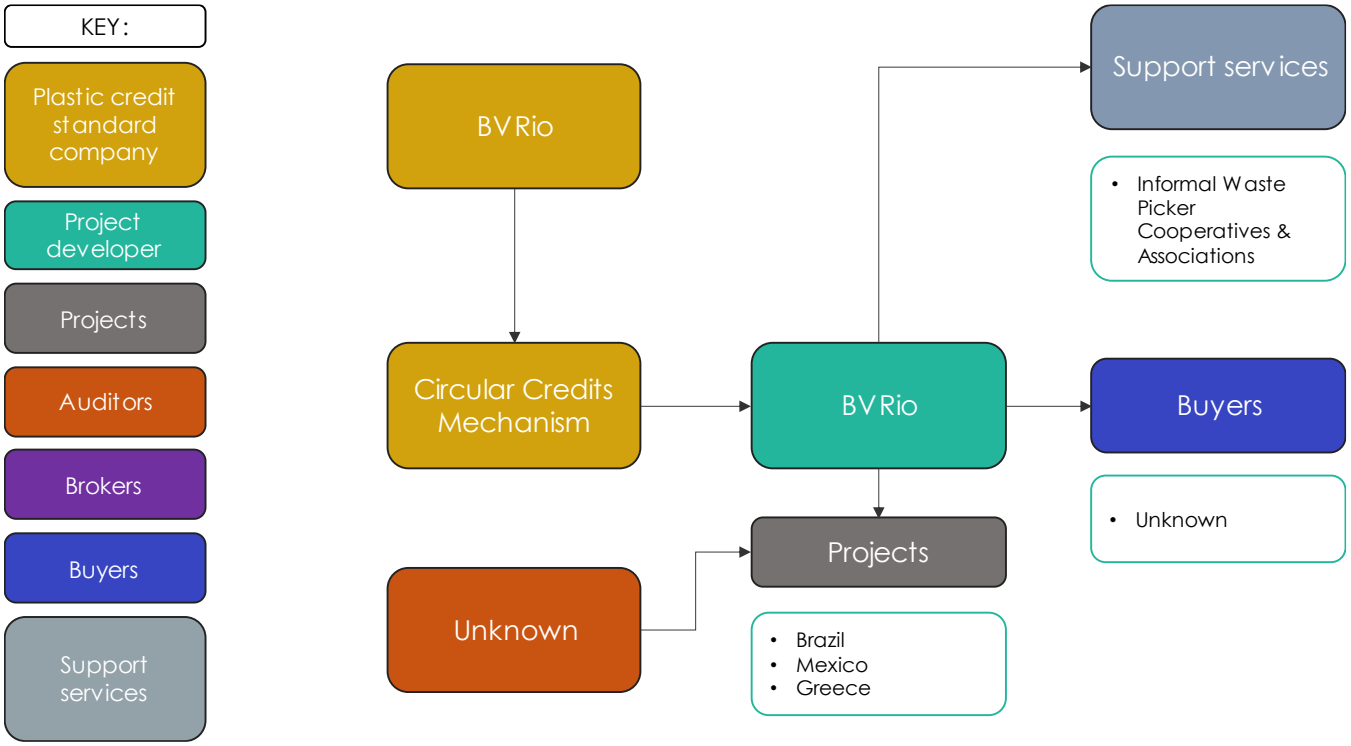
Project location: Brazil, Mexico, Greece

Overview

In 2021, BVRio partnered with the organisation PREVENT Waste Alliance to develop a pilot project under the CCM.[209] The aim of the project was to experiment with mechanisms to deliver plastic credits to low-income informal waste workers. The project channelled funds through 14 waste picker organisations in Brazil and Mexico and resulted in 1,710.95 tonnes of mixed plastic waste being recycled. The revenue generated by Circular Credits from these projects was channelled directly to waste collectors.[210,211] According to the CAH project registry, BVRio is currently involved in 21 projects in Brazil, Mexico and Greece. An overview of the BVRio plastic credit lifecycle is given in Figure 14 below:

[206] All About Africa (2024) Empowering Communities For A Sustainable Buying/Selling Of Plastics. Available at: Link
[207] ASASE Foundation (n.d.) Our Story. Available at: Link
[208] Interview with waste picker association.
[209] BVRio. (n.d.) PREVENT Waste Alliance: Plastic Credits for inclusive and transparent circularity. Available at: Link
[210] Circular Action Hub. 2021. Prevent – Plastics Circularity in Brazil. Available at: Link
[211] BVRio. (n.d.) Circular Bay – Community Plastic Recycling, Mexico. Available at: Link

Figure 14: BVRio plastic credit lifecycle



Community impacts

Through the CAH project registry, it is possible to determine the exact use of proceeds of each project. Several examples of how proceeds are used by projects run by BVRio are listed below:

- Project #347 Baía Limpa - Fishing for Litter: 'Infrastructure (weighing scale, adaptation for covered area), payment of fishers, payment of coordinators, purchase of materials for daily activities (bags, PPEs), admin costs, independent audit.'[212]
- Project #329 Increasing selective collection in Rio with AEPW: 'The project financed the renting of up to three extra trucks (including expenses with driver, assistants and fuel) to enable the cooperative to create new collection routes', which resulted in the creation 57 new jobs.[213]
- Project #265 Circular Bay - Community plastic recycling, Mexico: '100% for waste collectors - 30% to provide PPEs and 70% for direct income.'[214]

By working directly with informal waste worker associations, BVRio has been able to build an accurate picture of the needs of the workers and systems operating in the specific region in which the project is being implemented. BVRio has channelled the proceeds of plastic credits from these projects according to these needs and has therefore been able to compensate waste workers properly and effectively build capacity.[215]

A.5.6 Second Life Thailand

Certification standard: **Verra PWRS**

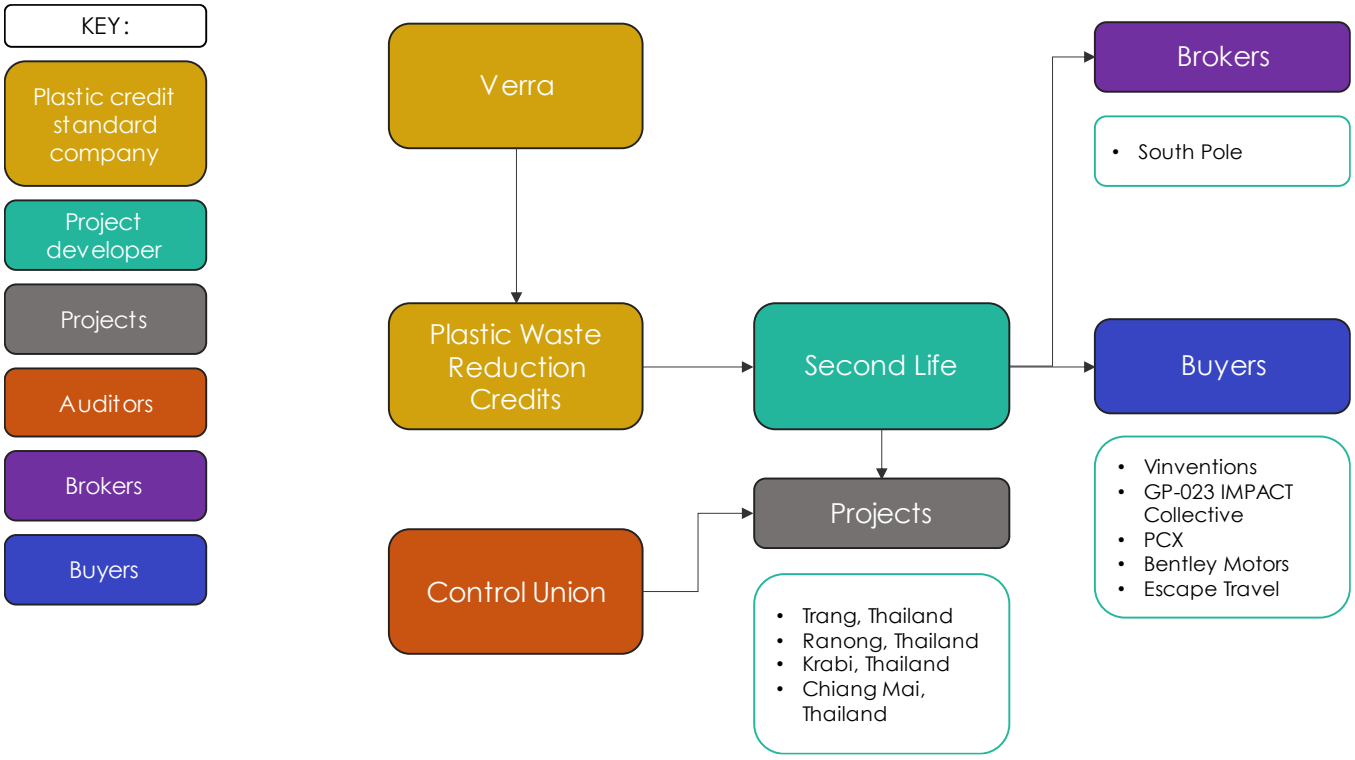
Project location: Thailand

[212] Circular Action Hub. 2024. Baía Limpa - Fishing for Litter. Available at: Link
[213] Circular Action Hub. 2023. Increasing selective collection in Rio with AEPW. Available at: Link
[214] Circular Action Hub. 2021. Circular Bay - Community plastic recycling, Mexico. Available at: Link
[215] BVRio (2023) How Plastic Credits can help reduce plastic pollution and increase recycling rates now. Available at: Link

Overview

Second Life operates a plastic upcycling project and three ocean plastic collection projects across Thailand. It was first established in 2020 by PUR, a social enterprise with a focus on nature-based solutions. Second Life was the first plastic collection and recycling project to be certified with Verra. The organisation has several corporate partners, including PCX, South Pole, Caudalie and Mars, which have supported and funded Second Life's projects. To date, the organisation has been issued 4,182 plastic credits and has retired 213 credits. Retirement beneficiaries include Bentley Motors, Escape Travel and PCX. An overview of the Second Life plastic credit lifecycle is given in Figure 15 below:

Figure 15: Second Life plastic credit lifecycle



Validation and monitoring

Second Life plastic credit projects are audited by Control Union and have been registered under the Verra PWC and PRC certifications since 18th March 2022. Annual monitoring reports for the period 2nd Jan 2020 to 31st December 2022 are available on the Verra registry. A detailed description of validation and monitoring processes are not available on the Second Life website.

Community impacts

In 2023, 1278 waste collectors were registered under the Second Life programme.[216] Second Life states that to maximise social impact projects are established "in geographies where waste infrastructure is underdeveloped, where plastic pollution heavily impacts the local biodiversity, or where the local community is vulnerable and marginalised".[217] Waste collectors receive a premium of 3 THB per kg ($US 0.08) plus 2 THB per kg ($US 0.06) for transport, and 1 THB per kg ($US 0.03) to the regional collector

[216] Second Life (2024) Annual Report 2023. Available at: Link
[217] Second Life (n.d.) About Us. Available at: Link

(aggregator) for monitoring the volumes collected and recycled. They also receive 7 THB per kg ($US 0.19) of the market price as the baseline.[218]

[218] Verra (2021) Second Life Project Description & Monitoring Report. Available at: Link

A.6.0 Perspectives from stakeholders on how to improve plastic credit schemes

The following section presents a range of perspectives from stakeholders on how plastic credit schemes and projects could be improved. It is important to note that not all stakeholders interviewed for the study supported all of these perspectives – instead they are perspectives shared and supported by one or a select few stakeholders.

Improving the democratisation and involvement of waste picker associations in plastic credit projects to avoid waste pickers losing out to more powerful actors

Two stakeholders interviewed discussed the need for local waste picker associations to be more involved in decision making when plastic credit projects are established, and for consultation with waste picker associations throughout the project and crediting process to improve. It is important to note, however, that this is an criticism that applies not just to credits but instead is a wider challenge to do with waste management, and is therefore not always an issue that project developers or potential buyers have control over. One waste picker association interviewed discussed how a plastic credit project had been established in a city district they operate in but that they had not been consulted, despite being the key association that represents waste pickers in the district. They believe that for the right decisions to be made that will be of benefit to the waste picker community, it is vital that these associations are involved early on in the process when a credit project is established, and consulted throughout. Whilst this is not an issue unique to plastic credit projects, it is important to include waste pickers in the design of waste management systems where possible, especially in the absence of legislation which ensures this. A wider system in which waste pickers are included would be more effective in tackling this issue than a series of individual projects across which there is no standardised approach. The interviewee went on to discuss how because waste pickers are too far removed from policy makers, decisions are made without their consultation and involvement, and therefore they have lost out as a result, with more powerful actors (project developers and intermediaries) being the ones who are benefitting the most from these projects.

Another interview representing the waste picker sector discussed how waste pickers could also have a role to play in the auditing process, alongside the third-party auditors already established in the project. This could improve the auditing process but also enable waste pickers to be more heavily involved in the project, and be more aware of how the project is progressing.

Removing barriers on eligibility for waste pickers to access credits

One waste picker association interviewed discussed that the waste pickers they represent had been excluded from working on the credit project because they had not met the requirements and had therefore been deemed ineligible. A representative of a waste picker association interviewed believes waste picker groups were unaware of why they had been deemed ineligible, and that it was therefore vital for these requirements to be communicated more clearly and transparently. Furthermore, the interviewee commented that the eligibility requirements should be adapted so that waste picker groups can receive credit payments directly and without the onerous barriers mentioned in section 4.0.

Improving transparency on the distribution of funds and the auditing process

A representative of a waste picker association interviewed believes that if NGOs are facilitating the distribution of credit funds, then they should be required to report transparently how the funds are spent and distributed among the supply chain. Furthermore, the interviewee believed that the auditing process conducted by the third-party auditor must also be made more transparent.

Improving income and working conditions for waste pickers

Several organisations interviewed for the study believed that currently credit projects are not improving the livelihoods and incomes of informal waste workers conducting the collections, and therefore called for "fair living income", and for waste pickers to be supported to organise and become integrated into more formal systems. Currently waste pickers do not tend to be formally integrated into projects, so although they receive an income for their collection work, they do not receive other employment benefits, like health benefits and insurance. Another concern is around the reliability of plastic credit projects, which creates uncertainty around income for waste pickers. Systematised programs, such as EPR, would provide a more reliable form of income for these groups. Social provisions should be implemented alongside transparent evaluation standards that cover wages, benefits, health and safety, and sustainability.[219] Whilst the full extent of these provisions may be difficult to implement in practice, a mechanism to increase transparency around social conditions of those working within plastic credit projects impacts could improve the livelihoods of waste pickers by increasing demand and therefore channelling more funding into these projects.

Seven Clean Seas (the case study of which is outlined in appendix A.5.2) is one example of a project developer that has been able to integrate informal workers into the formal sector through employment contracts and additional employee benefits.[220]

One interviewee believed that one means of improving wages for waste pickers would be to explore the possibility for waste picker groups to receive credit payments directly, rather than through a third party or intermediary. This would cut out intermediary organisations taking a proportion of the revenues, and could, they argued, lead to better incomes for waste pickers.

Improving understanding of plastics and their hazardous impacts

When outlining and giving information on the types of plastic credit projects that they accredit, the credit schemes reviewed in this study indicate what type(s) of polymer are being collected, recycled and/or recovered by each project. Although this is preferable to simply labelling the materials "plastic", one stakeholder interviewed discussed the need to move beyond thinking of plastics just at polymer level, and instead begin to think of plastics and treat plastics as a complex composition of materials in order to understand the hazardousness of each type of plastic, even within the same category of polymer. This stakeholder indicated that 'offsetting' through plastic credits is "not feasible" until we have the knowledge to truly understand the value of each tonne of plastic removed from the environment.

Funds from plastic producers to be invested in education and training

One stakeholder interviewed suggested that in addition to funding the cost of plastic waste collection, funds raised from plastic producers should also be used towards investment in waste management education and training. For example, there are cases of cooperatives in Bali working with women waste pickers (and their husbands) to provide education and training, which would they argued have a longer-term impact on waste management than simply funding short-term collections.

Address the lack of demand for credits by increasing engagement with corporates

Several project developers interviewed believed that a key reason for the lack of demand for credits (from corporates and other buyers) is a lack of engagement between project developers and buyers, meaning buyers do not have enough information about the projects they are looking to buy from to have confidence in their purchases. These developers believe it is vital for engagement with buyers to improve, both to raise awareness and give buyers first-hand experience of how these plastic credit projects operate and what they are achieving on the ground. It was suggested that this 'disconnect' between project developers (suppliers) and potential buyers (demand-side) could be addressed by

[219] The question of engagement with the informal sector for waste management is a live topic of debate, not just for credits.
[220] Seven Clean Seas (n.d.) Our Impact. Available at: Link

organising corporate representatives to visit the project sites, and that this would also mean they could increase their due diligence with the resulting effect of reducing the perceived risk of their purchase.

Improving the traceability of credit projects

Initiatives to improve the traceability of credit projects such as Seven Clean Seas' Periscope impact platform[221] should be introduced. This online digital platform gives buyers visibility of how exactly their funds are being used, which teams on the ground they are supporting, and what is being collected. Initiatives like this have the potential to offer more traceability than that offered by the current validation and monitoring requirements of plastic credit schemes.

Removing claims from the scope of plastic credits

One project developer interviewed stated that they have refused the sale of credits to an organisation which they deemed to be using credits for marketing purposes. Credit schemes which allow plastic claims to be used by buyers may be paving the way for greenwashing, by allowing buyers to make a claim whilst purchasing only a small number of credits which have limited impact in relation to the plastic footprint of the organisation. Currently, many plastic credit schemes rely on the project developer to control how credits are being used by buyers, rather than banning this practice or ensuring rigorous checks are in place so that claims cannot be overexaggerated.

[221] Seven Clean Seas (n.d.) Transparency. Available at: Link

A.7.0 Stakeholder list

Organisation	Interest or role in plastic credits
Verra	Credit standards provider
PCX Solutions	Credit standards provider
Philippine Alliance for Recycling and Materials Sustainability (PARMS)	Credit standards provider
Green Worms	Project developer
TONTOTON	Project developer
Nexus3Foundation	NGO studying credits
Alam Sustainability Consultants	Consultant studying credits
UC Berkeley	Academic researcher studying credits
Clean Oceans through Clean Communities	NGO studying credits
Tearfund	NGO studying credits and working with waste pickers
Earth Journalism Network	Journalism
SourceMaterial	Journalism
Kpone Landfill Waste Pickers Association	Waste picker association
Green Waste Pickers Cooperative Ltd	Waste picker association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