



Methane Emissions Mitigation by Waste Pickers: The Case of Valparaíso

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Executive Summary

The waste sector is the third-largest source of anthropogenic methane emissions worldwide. These result primarily from the breaking down of food waste and other biodegradable materials in landfills. The anaerobic conditions at these sites trigger the production and release of methane, a greenhouse gas (GHG) with a short-term global warming potential significantly higher than that of carbon dioxide. Therefore, reducing the amount of organic waste sent to landfills is one of the most effective strategies for mitigating methane emissions, while also extending the useful life of landfills and laying the groundwork for sustainable waste management. Numerous national and international commitments and policies have identified the reduction of methane emissions from the waste sector as a priority. In Chile, the National Organic Waste Strategy (ENRO) has served as a starting point in this regard.

The National Waste Pickers Movement of Chile (ANARCH) is taking foundational steps to find solutions for organic waste through management models led by waste pickers. Among these is a pilot project in the city of Valparaíso, in collaboration with its local affiliate, the El Molle Workers' Cooperative. The project aims to mitigate methane emissions from the waste sector through the separate collection and composting of organic waste from the El Cardonal wholesale market, the resulting reduction in the amount of waste sent to landfills, and the creation of new economic opportunities for waste pickers. El Cardonal is a wholesale market for fruits, vegetables, and other foods that also houses restaurants, resulting in large amounts of organic waste. After being separated at the source and collected separately, the organic waste will be processed through composting, with the goal of transforming it into compost for use in green spaces, agriculture, and other applications. Collection and processing will be carried out by the El Molle Workers' Cooperative. Local organizing and technical training for five waste pickers have taken place; full treatment can start only after the required authorizations and site operating arrangements are in place. At the same time, the cooperative will develop a business model to assess the financial sustainability of this type of initiative and generate evidence for its future replication in other cities across the country. The project has the support of the Municipality of Valparaíso and forms part of a just transition for people working around the El Molle landfill, whose operating life is limited. ANARCH has organized these waste pickers and, through its local advocacy, helped bring about a municipal agreement with a management system under Chile's Extended Producer Responsibility Law. It is also advancing a waste picker-operated waste pretreatment and management facility within the El Molle site; construction remains subject to feasibility, permits, operating agreements, and financing, yet some testing operations have been initiated. The modeled intermediate-scale scenario estimates potential methane savings of 211 tonnes of methane emissions per year; the full-scale scenario estimates 4,679 metric tonnes of methane emissions savings annually by 2030. These figures depend on implementation and the scale of treatment actually achieved. This is equivalent to the GHG emissions of 30,559 gasoline-powered cars per year and represents an 8.4% reduction in Valparaíso's waste-sector methane emissions by 2030.

Introduction

Globally, the waste sector is the third-largest source of anthropogenic methane emissions. Most of these emissions come from the decomposition of food waste and other biodegradable materials in landfills. The anaerobic conditions within landfills encourage the generation and release of methane, a greenhouse gas (GHG) with a short-term global warming potential that is significantly greater than that of carbon dioxide. As a result, reducing the volume of organic waste sent to landfills is among the most effective strategies for mitigating climate change, while also extending the useful life of landfills and creating the basis for more sustainable waste management.

Numerous national and international commitments and policies have prioritized the need to reduce methane emissions from the waste sector, including the Global Methane Pledge¹, the ROW Declaration², and the UN Secretary-General's Call to Action on Methane³, among others. In Chile, the National Organic Waste Strategy (ENRO)⁴ has served as a starting point towards this end.

Around the world, many grassroots organizations, cooperatives, and waste pickers' organizations are implementing organic waste recycling projects, either independently or in collaboration with local governments. These projects are proving to be effective and fast in reducing methane emissions and fostering a sense of community in local areas. However, political and financial support for these initiatives remains limited. To address this, the objective of this document is to explore the potential impact of a waste picker-led organic waste composting process in Valparaíso on reducing methane emissions, as well as to analyze the challenges and opportunities for its implementation and scaling up.

¹ <https://www.globalmethanepledge.org/>

² Reduce Organic Waste initiative, launched at UNFCCC COP29 in 2024. Available at: <https://cop29.az/en/pages/cop29-declaration-on-reducing-methane-from-organic-waste>

³ United Nations Secretary-General's Call to action on methane Three sectors, nine actions by 2030.

https://www.un.org/sites/un2.un.org/files/unsg_call_action_methane_by-2030_publication.pdf

⁴ Ministerio del Medio Ambiente de Chile, Estrategia nacional de residuos orgánicos Chile 2040.

<https://economiacircular.mma.gob.cl/wp-content/uploads/2021/03/Estrategia-Nacional-de-Residuos-Organicos-Chile-2040.pdf>

Composting Project Led by Waste Pickers in Valparaíso

LOCATION Valparaíso, Chile	MUNICIPAL SOLID WASTE GENERATION 133,000 metric tonnes per year	ORGANIC WASTE STREAM 72%
PROJECT NAME Upscaling Community-based Waste Management Projects Through Project Co-development With The Informal Sector	ORGANIC WASTE TO BE RECOVERED 200 kg/day (pilot phase) – 3.4 metric tonnes/day (intermediate scale) and 50 metric tonnes/day (full-scale)	
TREATMENT windrow composting	SOURCE OF WASTE El Cardonal wholesale market (pilot phase) + households (full-scale phase)	

In an effort to advance solutions for organic waste through management models led by waste pickers, the National Waste Pickers Movement of Chile (ANARCH)⁵ is developing a pilot project in the city of Valparaíso together with its local affiliate, the El Molle Workers' Cooperative. The initiative is part of the project "Upscaling Community-based Waste Management Projects Through Project Co-development With The Informal Sector"⁶, funded by the Climate and Clean Air Coalition (CCAC)⁷ and led by Global Alliance for Incinerator Alternatives (GAIA), ANARCH in Chile, Yaksa Pelestari Bumi Berkelanjutan (YPBB) in Indonesia, and groundWork in South Africa. The project aims to mitigate methane emissions from the waste sector through diverting organic waste from disposal sites, creating new economic opportunities for waste pickers.

The ANARCH initiative involves implementing a pilot system for the separate collection of organic waste at El Cardonal Market in Valparaíso. El Cardonal is a wholesale market for fruits, vegetables, and other foods;

⁵ <https://anarch.cl/>

⁶ Upscaling Community-based Waste Management Projects Through Project Co-development With The Informal Sector. Available on: <https://www.ccacoalition.org/projects/upscaling-community-based-waste-management-projects-through-project-co-development-informal-sector>

⁷ <https://www.ccacoalition.org/>

in addition to retail sales, it has an entire floor dedicated to restaurants, which generates large amounts of organic waste daily. During the pilot phase, the plan is to process up to 200 kilograms of organic waste per day; in an intermediate phase, this would increase to 3.4 metric tonnes per day; and at full scale, 50 metric tonnes per day will be processed, including food waste from households as well.

The organic waste will be processed through windrow composting with the goal of transforming it into compost, an organic soil amendment suitable for use in public parks, agriculture, and other applications. Collection and processing will be handled by the El Molle Workers' Cooperative. ANARCH and the cooperative have advanced discussions with the market and provided three technical training sessions for five waste pickers. Organic waste treatment at or near El Molle remains contingent on sanitary approvals and operating arrangements for the site; the source separation and composting described here are part of the pilot design, not an operation already underway, with the exception of the testing procedures described below. At the same time, the project will develop a business model to assess the financial sustainability of this type of initiative for its future replication in other cities across the country. The project has the support of the Municipality of Valparaíso, which seeks to mitigate GHG emissions and promote the circular economy in the region.

In September 2026, the cooperative hit a milestone by beginning to process organic waste. Food waste collected through commercial collection routes is mixed with green waste, which is used as a structural material to build the compost piles. Since there is still no adequate separation at the source, waste pickers must identify bags containing organic material and manually remove any non-organic discards before beginning the treatment process. The cooperative is using its own equipment—normally used for processing recyclable materials—to turn the compost piles. Furthermore, in response to the region's water scarcity, they have implemented a water recirculation system that optimizes water use during the process. To date, one metric tonne of organic waste has been processed. Although this is an initial-scale effort to test the operations, the project represents a strategic step forward: it allows workers to develop practical skills, test procedures, identify technical needs, and lay the operational groundwork for future scaling of the project.

The initiative also presents a concrete opportunity to promote a just transition in the region. Its scale-up could initially create six formal green jobs, offering a dignified employment alternative to people currently working at the area's only landfill. At the same time, it would drive progressive reduction of organic waste disposal, lower methane emissions, extend the landfill's useful life, and produce compost for soil restoration.

At a larger scale, the project could incorporate other forms of waste recovery, including energy recovery from the organic fraction when technical and economic conditions permit. Generating measurable climate, social, and environmental impacts can also facilitate access to long-term climate and green financing. In this way, the initiative promoted under the CCAC-ANARCH project demonstrates that organic

waste management can become a concrete tool for climate action, decent work, productive innovation, and regional development.

This project builds on ANARCH's extensive work to gain recognition for the work of waste pickers in Chile and to improve their living conditions. In recent years, ANARCH has supported the formation and strengthening of a national network of more than 50 cooperatives across 14 regions, also organized through federations, while building technical capacity, access to formal service contracts, and influence over recycling policy. ANARCH is also a key player in the implementation of the Extended Producer Responsibility (EPR) Law (Law No. 20,920), although it acknowledges that, despite its efforts, a significant gap remains in the participation of waste pickers, most of whom have not been able to obtain certification under the EPR system. To address this, ANARCH builds strategic alliances to ensure the participation of waste pickers within the framework of the law.

This advocacy is visible in Valparaíso, where ANARCH is helping organize waste pickers who work at and around the El Molle landfill. As the site approaches the end of its operating life, a just transition requires their participation in decisions, recognition as service providers, and access to fairly paid work and secure livelihoods. ANARCH's local advocacy helped bring about an agreement between the Municipality of Valparaíso and an EPR management system, opening a path for local waste pickers to take part in collection and recovery services.

The next proposed step is a waste picker-operated waste pretreatment and management facility within the El Molle site. It is intended to recover materials and divert organics before final disposal, with governance and employment that can continue beyond the site's closure. The facility has not yet been built or started operating: it depends on sanitary permits, agreements with the site operator, technical feasibility, and financing. In response to these external barriers, the scope of the CCAC project was adjusted; technical training, local organizing, and testing operations are tangible advances, while the planned composting operation remains pending.

Local and National Context

ANARCH's project is taking place against a pressing backdrop in the region, driven by the imminent saturation of the El Molle landfill. The municipality of Valparaíso manages more than 133,000 metric tonnes of municipal solid waste per year, which is disposed of at the landfill, operated by the company Veolia. The landfill receives 50% of the municipal solid waste from the Valparaíso region, and its end of life is scheduled for 2028⁸. Valparaíso is one of the communes in the country with the highest percentage of organic waste: it accounts for 72% of municipal solid waste, well above the national average of 58%^{9,10}. This highlights the need to implement programs for source separation and recycling of organic waste to prevent landfill disposal. Planning for the closure of El Molle must include the people whose livelihoods depend on the site: their organization, a voice in decisions, access to infrastructure and contracts, and continuity of income are essential elements of a just transition. While there are some interesting initiatives to rescue edible food and keep it from becoming waste—such as the *EcoMercados Solidarios* program and community kitchens—there are no formal, long-term programs for the separate collection and recovery of organic waste.

The project will also contribute to the implementation of the National Organic Waste Strategy (ENRO), adopted in 2021, which sets targets to recover 30% of organic waste by 2030 and 66% by 2040. Nationwide, it is estimated that Chile produces more than 4 million metric tonnes of organic waste per year, of which less than 1% is recovered¹¹. Finally, the project will contribute to meeting the targets set out in Chile's Nationally Determined Contribution (NDC) submitted in 2025. The NDC includes specific commitments related to reducing methane emissions from the waste sector and improving organic waste management, namely: 1) reaching peak methane emissions in 2025 and reducing them by 10% by 2035, including industrial organic waste, and 2) promoting the recovery of organic waste, with legislation in place by 2027 and regional strategic plans in at least 50% of the regions by 2028¹².

⁸ SUBDERE (2024) Diagnóstico y catastro regional de residuos sólidos domiciliarios, Región Valparaíso.

⁹ Estudio Diagnóstico y Catastro de RSD Año 2017, SUBDERE

¹⁰ Estrategia Nacional de Residuos Orgánicos Proceso participativo Región de Valparaíso, 2019.

¹¹ Ministerio de Medio Ambiente de Chile <https://economiacircular.mma.gob.cl/residuos-organicos/>

¹² Contribución Determinada a Nivel Nacional de Chile 2025-2035. <https://archivocambioclimatico.mma.gob.cl/contribucion-determinada-ndc/descripcion-del-instrumento/>

Greenhouse Gas Emissions Analysis

The methane emission mitigation potential of the ANARCH pilot project is calculated below using the Combined CH₄ and CO₂ Emissions from Waste Calculator, developed by Eunomia for GAIA.

Four scenarios were evaluated: baseline (pre-project conditions), pilot (initial), pilot (medium-scale project), and full-scale project. In the baseline scenario, organic waste is neither separated nor treated. The pilot initial pilot scenario aims to separately collect and treat 73 metric tonnes of organic waste annually through composting, the medium-scale 1,241 metric tonnes. In the full-scale scenario, 18,250 metric tonnes per year will be diverted from landfills and treated through composting.

Scenarios	Organic waste processed (% of Valparaíso's organic waste)	Organic waste processed (tonne per day)	GHG emissions, 2030 (annual tonnes, CO ₂ e)	Methane emissions, 2030 (annual tonnes, CO ₂ e)	Methane savings by 2030 (annual tonnes, CO ₂ e)
Baseline	0	0	79,006	55,439	N/A
Initial pilot	0.07	0.2	78,998	55,431	8
Pilot-medium size	1.3	3.4	78,694	55,228	211
Full scale	19	50	71,124	50,760	4,679

Table 1. Estimated Greenhouse Gas Emissions from the ANARCH Project

The results show that, by 2030, the pilot project at its intermediate size would reduce annual CO₂e emissions from 79,006 metric tonnes at the baseline to 78,694 metric tonnes of CO₂e. Methane emissions would decrease from 55,439 metric tonnes to 55,228 metric tonnes annually—a reduction of 0.4%. The full-scale project would result in emissions of 71,124 metric tonnes of CO₂e by 2030, preventing the emission of 7,882 metric tonnes annually. As for methane emissions, they would decrease from 55,439 metric tonnes per year at the baseline to 50,760 metric tonnes per year by 2030, preventing the emission of 4,679 metric tonnes of CH₄ annually. This is equivalent to the GHG emissions of 30,559 gasoline-powered cars per year¹³ and represents an 8.4% reduction in methane emissions by 2030.



¹³ Estimates based on <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

Challenges and Recommendations

The implementation of organic waste recovery projects led by waste pickers presents a series of opportunities and challenges¹⁴. Waste pickers' track record, their knowledge of different types of waste and markets, the ties they have established with the community, and the logistics they have developed for recovering recyclable materials offer significant advantages when incorporating the organic fraction into their operations. Furthermore, the ability to offer organic waste collection and processing services opens up new economic opportunities, stemming from charging service fees and the sale of products such as compost.

Capital investment, sanitary permits, and operating agreements to enable treatment are central challenges identified by the project. Within this investment, the availability of land for organic waste processing poses a challenge that can be overcome through coordination with municipalities and the provision of publicly owned land. Support to cover or finance initial investment costs can be established through agreements between governments and waste picker cooperatives. This type of public-private partnership with waste picker cooperatives significantly reduces capital costs while shortening the transport distances for waste sent to final disposal sites, resulting in cost savings and reduced emissions.

The lack of established programs for separate collection and processing of organic waste at the municipal level makes these types of projects pioneering in their field. This involves laying the groundwork for the development of organic waste recovery systems, with the challenges associated with changing established models based on linear waste management (collection-disposal) and affecting economic interests, innovating, strengthening other stakeholders, and fostering a culture focused on preventing waste generation and disposal.

¹⁴ For a comprehensive analysis, read Rached, S. (2026) Managing Organics with Waste Pickers: A Briefing for Policymakers, GAIA. <https://www.no-burn.org/resources/managing-organics-with-waste-pickers-a-briefing-for-policymakers/>

Recommendations

Build firm policy frameworks that enable source-separated organic waste recovery:

- Move forward with the approval of a national framework law on organic waste that promotes and facilitates the recovery of organic waste throughout the country, with guaranteed funding.
- Adjust regulations on organic waste recovery at all governmental levels to facilitate the installation of treatment plants for this type of waste without compromising environmental quality. Provide support to grassroots waste picker cooperatives, civil associations, and small businesses during the process of obtaining permits and authorizations.
- Establish policies mandating the separation of organic waste at the source, and develop mechanisms for separate collection and processing at the municipal level.

Recognize and ensure integral participation of waste pickers:

- Recognize waste pickers as workers and waste service providers, guarantee their labor rights as workers, and formally define waste pickers in public policies. This includes their recognition and inclusion in the waste management systems designed by municipalities and their associations, and other waste management operators.
- Incorporate just transition mechanisms into all relevant waste-related programs and regulations, especially when disposal sites are closing: ensure waste pickers can participate in decisions, have their work recognized, receive training, and gain access to infrastructure, paid contracts, and secure livelihoods
- Ensure the informed participation of waste pickers in the negotiation and drafting of decrees and other regulations that affect them.
- Develop technical training programs for municipal officials and operators—including waste pickers—on various techniques for the recovery of organic waste.

Finance organic waste recovery:

- Increase public funding for the development of organic waste recovery programs, with allocations earmarked for projects led by waste pickers.
- Establish co-management models that entrust the collection and processing of organic waste to waste picker cooperatives with appropriate compensation, and provide land and infrastructure for the processing of organic waste.

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About GAIA

GAIA is a network of grassroots organizations and national and regional alliances representing more than 1,000 organizations in over 100 countries. Our goal is to catalyze global change toward environmental justice by strengthening social movements that promote solutions to waste and pollution. We work toward a just, zero-waste world based on respect for ecological limits and community rights—a world where people are free from the burden of toxic pollution and resources are conserved sustainably, without being incinerated or landfilled

www.no-burn.org

About ANARCH

The National Association of Waste Pickers of Chile (ANARCH) works to dignify grassroots waste picking. In recent years it has connected more than 50 cooperatives across 14 regions, supporting formalization, technical capacity, and participation in recycling services and policy. In Valparaíso, it works with El Molle waste pickers so that reducing waste and methane also delivers a just transition led by the people who work in the territory. <https://anarch.cl/>



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