



GAIA's NDC Checklist

**Guidance on integrating waste
and methane reduction
into the NDCs 3.0 in alignment
with Environmental Justice Principles**

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Index

Introduction: zero waste and climate change	2
NDCs revision: a critical opportunity to take action	3
Guidance on integrating waste and methane reduction into NDCs	4
The Environmental Justice Principles for Fast Action on Waste and Methane	4
NDC Checklist: at a glance	5
NDC Checklist: specific recommendations	6
1. Ensure alignment with the priorities set out on the waste hierarchy	6
2. Protect the livelihoods of waste pickers and waste workers to deliver just transition	13
3. Include local organizations and communities in the decision-making process	16
4. Include mechanisms for compliance and accountability to do no harm	18
5. Design climate interventions within a multidimensional framework	20
References	21

Introduction: zero waste and climate change

Zero waste solutions are a fundamental part of the efforts to reduce greenhouse gas emissions, build resilience and ensure justice and equity at the heart of the transition to a sustainable planet. These are versatile strategies that aim to continually reduce waste through source reduction, separate collection, composting and recycling, ensuring that all discarded materials are safely and sustainably returned to nature or manufacturing. Most importantly, zero waste strategies help societies produce and consume goods while respecting resource scarcity, planetary boundaries and the rights of communities. Practicing zero waste means moving toward a world in which all materials are used to their utmost potential, nothing goes to waste, and the needs of people—workers and communities—are met through a system that protects and does no harm to the environment.

Looking at methane emissions in particular, the waste sector is the third largest source of human-caused methane emissions, whose reduction will deliver rapid climate benefits through avoided warming. Methane's heat-trapping capacity is 86 times higher than carbon dioxide over a 10-year period. The waste sector could reduce methane emissions by 95% through a combined approach that prevents food waste, recovers edible surplus food, separately collects and processes organic waste and reduces emissions at disposal sites. This approach is a key part of any zero waste system.

As governments around the world undertake the task of reviewing their current Nationally Determined Contributions (NDCs) to the Paris Agreement, it is important to remember that waste management is one of three sectors with the greatest potential to reduce surface temperature rise in the next 10-20 years.¹ With the climate crisis growing more urgent and deadly every day, governments should not miss such an important chance to employ zero waste as a common-sense, affordable strategy toward zero emissions and a sustainable economy.

¹ IPCC 2021

NDCs revision: a critical opportunity to take action

NDCs are the centerpiece of the Paris Agreement ambition cycle, according to which they should be presented every five years and reflect the highest possible level of ambition. Taking into account every country's fair share, they should address all goals defined in Article 2 of the Paris Agreement and define a range of measures which are mutually reinforcing to reach the long term goals on temperature, resilience, means of implementation and cross-cutting measures. In this round of NDCs, it's imperative that GHG emissions reductions amount collectively to 43% by 2030 and 60% by 2035 for the world to stand a chance to keep global warming to 1.5 degrees, with developed countries taking the lead with higher ambition and stronger targets.²

It is essential to conceive NDCs as comprehensive climate action plans beyond the mitigation targets. NDCs have to capture the wider purpose of policies and plans that must steer the transformation of our societies with climate safe, just, equitable and sustainable pathways. They can also encompass adaptation and loss and damage measures and should also address climate finance.

Moreover, the mitigation efforts must be clear, transparent and understandable in terms of the requirements set out in Annex I to decision 4/CMA.1. NDCs also need to be seen in the strategic context of long-term strategies (LTS) that are commensurate with near zero global gross emissions by 2050 and build resilience to the anticipated threats posed by the changing climate. NDCs should be the building blocks towards achieving this strategic vision for a country's 2050 social, environmental and economic development.

The GAIA's NDC Checklist has been developed precisely to support governments in accomplishing this critical task and fully utilize the solutions in the waste sector. In alignment with the Environmental Justice Principles for Fast Action on Waste and Methane, the GAIA's NDC Checklist aims to assist policymakers in the development and implementation of a climate mitigation strategy in the waste sector, looking specifically at methane reduction but also addressing other cross-cutting factors involved in the materials economy.

This checklist is primarily designed for policy makers, experts, and project developers tasked with improving their national NDCs, but it can also be used for other climate and waste related policies at the regional, national, and local level. Ultimately, this checklist is a tool for building a roadmap to a transformative waste sector rooted in environmental justice.

² CAN International, Guidelines for NDCs 3.0: Delivering on the GST outcome and beyond, May 2024. <https://climatenetwork.org/wp-content/uploads/2024/05/CAN-Guidelines-NDCs.pdf>

Guidance on integrating waste and methane reduction into NDCs

The Environmental Justice Principles for Fast Action on Waste and Methane

The GAIA's NDC Checklist is based on the Environmental Justice Principles for Fast Action on Waste and Methane, a framework produced through the facilitated consultation and collaboration amongst 99 GAIA member organizations in 41 different countries about the future of zero waste systems and environmental justice. The final document was presented at the UNFCCC COP 28. Following its publication, this document was discussed at several public events with environmental leaders from the food and waste sector to develop an agenda for methane mitigation based on community organizing and justice, and will continue to be utilized to elaborate plans for this work in the future.

There are five Environmental Justice Principles for Fast Action on Waste and Methane:

- (1) **Respect planetary boundaries to ensure intergenerational equity: recognizing ecological limits, the waste hierarchy must be applied to reverse climate change and drive a just transition that ensures intergenerational equity.**
- (2) **Respect for all waste pickers and waste workers: upholding and strengthening human rights, we must center equity and justice in all our actions, protecting the livelihoods of waste pickers and waste workers, and ensuring no harm in the first place.**
- (3) **Enhance inclusion and build from local knowledge: in decision-making processes, enhancing inclusion and meaningful participation is a must, along with building from local knowledge and expertise.**
- (4) **Respond to pollution and environmental harm with accountability: any pollution or environmental harm caused must be addressed with accountability, putting means in place to compensate for damages and prevent further harm.**
- (5) **Support holistic solutions through systems change: A systemic point of view must be used to find solutions for interrelated crises like climate, public health, poverty, gender, racial and class injustice, inequality, conflict, and war, and to ensure solutions in the waste sector meet and exceed Sustainable Development Goals and climate targets.**

The Environmental Justice Principles for the waste sector outlined above provide a set of standards and criteria for decision-making processes in this field. For waste and environmental justice principles to become a reality, a conducive policy environment as well as a robust implementation system is required. Moreover, it is critical to have clear and practical implementation plans and toolkits to ensure the success of zero waste and methane reducing strategies.

Below are recommendations on how to operationalise these principles. This guidance is for policymakers, sustainability professionals, environmental advocates, and grassroots organizers seeking to reduce methane while striving for zero waste and environmental justice. As such, these principles need to be processed and applied to the design, development, and implementation of environmental and waste policy at all scales.

NDC Checklist: at a glance

- Recognize the importance of the waste sector to deliver rapid action in mitigation, adaptation, and other essential benefits, and establish appropriate allocation of financial resources to ensure effective implementation.

- Include mandatory climate action measures in the waste sector, both at national and subnational level, that will enhance job creation for waste pickers and waste workers. In particular, NDCs at the national level need to be reflected in climate action plans at the local level where job creation needs to be a critical priority.

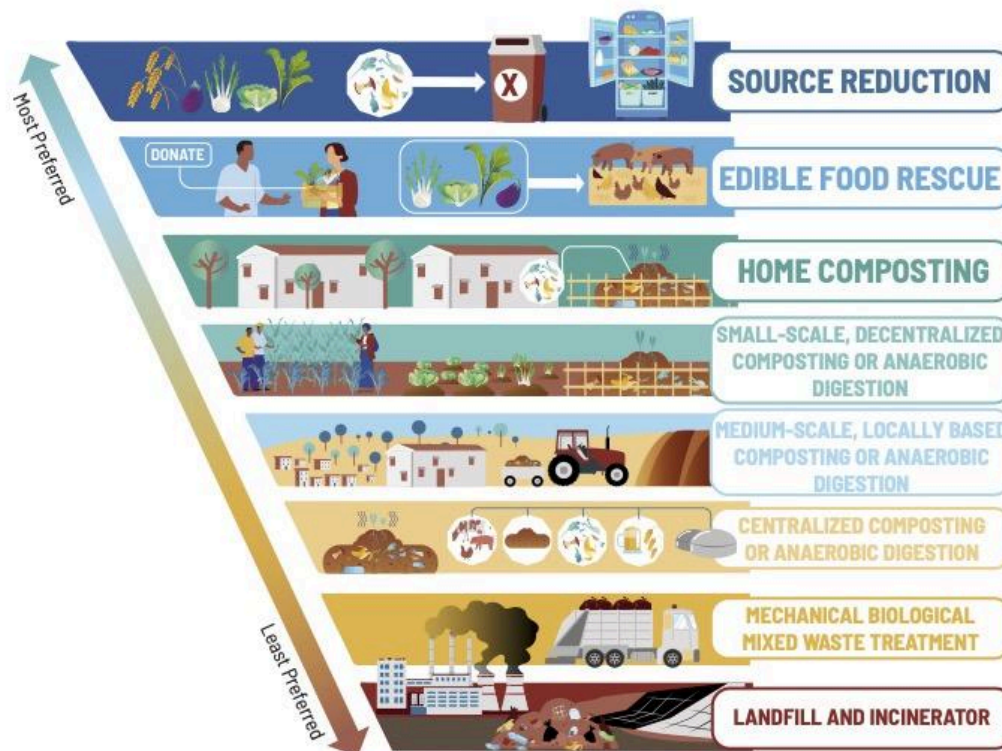
- Include GHG emission reduction targets in the waste sector, in alignment with the priorities set out in the Waste Hierarchy.
 - Measures to reduce food loss and food waste
 - High impact treatment of organic waste e.g. source segregation, separate collection, composting, anaerobic digestion, recycling of woody materials, and biogas production.
 - Exclusion of thermal waste disposal eg waste-to-energy incineration
 - Exclusion of Refuse-Derived Fuel (RDF) production

- Include provisions for enhanced participation and better governance, including participatory consultation processes with civil society and in particular local organizations (including trade unions and service providers) involved in waste management at the local level to leverage their expertise and engagement in the process.

NDC Checklist: specific recommendations

1. Ensure alignment with the priorities set out on the waste hierarchy

The organic waste hierarchy to reduce methane in the waste sector following Environmental Justice Principles – as described below – provides guidance on the policy priorities that should be introduced in the next round of NDCs.



Source: Institute for Local Self-Reliance

1. Organic waste prevention: interventions available at every step of the supply chain, from production to transportation to consumption

- Waste prevention is the most important methane reduction strategy in the waste sector; every tonne of organic material that never enters the waste stream avoids the methane it would have generated in a landfill, as well as the upstream emissions involved in its production and transport.
- Food loss and waste are responsible for 10% of all GHG emissions worldwide³ and a majority of solid waste methane emissions.⁴ Thus it is especially

³ Gikandi, L. (2021) 10% of all greenhouse gas emissions come from food we throw in the bin. [ONLINE] Available at: <https://updates.panda.org/driven-to-waste-report>

⁴ Brown, S. (2016) Greenhouse gas accounting for landfill diversion of food scraps and yard waste. *Compost Science & Utilization*, 24(1): 11–19. [ONLINE] Available at: <https://doi.org/10.1080/1065657X.2015.1026005>

important to avoid. Furthermore, opportunities for food waste and food loss prevention are available at every step of the supply chain for organic goods, from amending subsidies that encourage food overproduction, to instituting demand-planning programs or food donation mandates in supermarkets, to educating consumers about waste prevention.^{5,6} France's recent food-waste-prevention law, for example, fines supermarkets that exceed a set cap for discarded food.⁷

2. Food recovery: Redistribution to people and reprocessing into preserved food products

Where direct prevention fails, recovery is the next best option – discarded food can be redirected to people in need or repurposed for preserved products like jams. In the Asia Pacific region, local and traditional practices to reduce food loss and waste include surplus crops preservation through sun drying, pickling or fermenting. These practices need to be upgraded and supported with appropriate technologies to ensure better quality and shelf life. For example, budgeting for providing solar fish dryers / firewood fired fish dryers for coastal communities should be seen as part of climate action and food waste reduction, and they could be supported through interest free loans, grants and subsidies to local communities to upgrade their traditional practices need to be made visible in the checklist. In Milan (Italy), collaboration between food banks, grocery stores, and local government has led to 130 million tonnes of food waste saved annually in just three years, putting the city well on its way to achieving its goal of 50% food waste reduction by 2030.^{8,9} Prevention of food losses and waste, including the promotion of programs that guarantee access to food for the poorest population with nutritional security and food sovereignty, is a positive step forward. More information on Food Loss & Waste and other internationally successful stories can be found in GAIA's publication: [Cutting Methane Emissions through Zero Food Waste Systems](#).

3. Food waste recovery: Redistribution to animal feed

Diverting organic discards to feed livestock avoids landfill methane emissions and can displace conventional, energy-intensive feed crops (see section 2). Though estimates of the methane

⁵ Zero Waste Europe and Slow Food (2021) *Reducing food waste at the local level: Guidance for municipalities to reduce food waste within local food systems*. [ONLINE] Available at: <https://www.slowfood.com/wp-content/uploads/2022/01/Guidance-on-food-waste-reduction-in-cities-EN.pdf>

⁶ ReFED (n.d.) *Roadmap to 2030: Reducing US food waste by 50%*. [ONLINE] Available at: <https://refed.org/food-waste/the-solutions/#roadmap-2030>

⁷ Zero Waste Europe (2020) *Zero waste Europe factsheet: France's law for fighting food waste*. [ONLINE] Available at: https://zerowasteurope.eu/wp-content/uploads/2020/11/zwe_11_2020_factsheet_france_en.pdf

⁸ Bottinelli, S. (2021) The city of Milan's Local Food Hubs reduce 130 tonnes of food waste a year, and win EarthShot Prize. *Food Matters Live*, 18 October 2021. [ONLINE] Available at: <https://foodmatterslive.com/discover/article/milan-local-food-hubs-reduce-130-tonnes-of-food-waste-a-year-and-win-earthshot-prize>

⁹ Food Policy di Milano (2021) "Milan Food waste hub" won Prince William's Earthshot Prize. [ONLINE] Available at: <https://foodpolicymilano.org/en/milan-food-waste-hub-won-prince-williams-earthshot-prize/>

reduction potential of using organic discards for animal feed are lacking, one life cycle analysis found that the practice can deliver greater overall GHG reductions than composting or AD.^{10,11}

4. Material Recycling, Composting and Anaerobic Digestion

Material recycling: cities are often dealing with slow decaying organic materials such as tree cuttings, wood and other woody plant materials. These are often recycled into other products, rather than composted; for example, coconut husk may not get composted but the fiber can be extracted and repurposed. Similarly, coconut shells are not composted but converted into charcoal; other woody materials are also sent for charcoal production.

Composting: unlike landfills, well-managed compost operations produce minimal amounts of methane, most of which is destroyed by bacteria.^{12,13,14} Composting can prevent as much as 99% of methane emissions that would otherwise be released from landfills,^{15,16} greatly reducing waste sector emissions. Decentralised, on-site management compost units are well-considered, but there are composting units and methods for all contexts.¹⁷

Anaerobic Digestion (AD): where organic discards are intentionally broken down in the absence of oxygen to produce methane for fuel – can be a suitable complement or alternative to composting. Unlike landfills, which constantly leak methane into the atmosphere, anaerobic digesters are sealed vessels that collect methane until it is burned as fuel, converting it into biogenic CO₂. AD also generates a smaller proportion of residual organic matter, called digestate, which can be composted and used as soil amendment. AD is often well suited for dense areas with large amounts of organic discards and little room for composting facilities, but has higher capital costs and requires more technical training to operate.¹⁸ Cheaper, small-scale AD units have also been employed with great success in remote communities with less reliable access to energy grids in countries such as Bangladesh, India, and China.¹⁹

¹⁰ Saleemdeen, R., Zu Ermgassen, E. K., Kim, M. H., Balmford, A. & Al-Tabbaa, A. (2017) Environmental and health impacts of using food waste as animal feed: A comparative analysis of food waste management options. *Journal of Cleaner Production*, 140: 871–880 <https://doi.org/10.1016/j.jclepro.2016.05.049>

¹¹ Broom, D. (2019) South Korea once recycled 2% of its food waste. Now it recycles 95%. *World Economic Forum*, 12 April 2019 <https://www.weforum.org/agenda/2019/04/south-korea-recycling-food-waste/>

¹² Cabanas-Vargas, D. D. & Stentiford, E. I. (2006) Oxygen and CO₂ profiles and methane formation during the maturation phase of composting. *Compost Science & Utilization*, 14(2): 86–89 <https://doi.org/10.1080/1065657X.2006.10702269>

¹³ Jäckel, U., Thummes, K. & Kämpfer, P. (2005) Thermophilic methane production and oxidation in compost. *FEMS Microbiology Ecology*, 52(2): 175–184 <https://doi.org/10.1016/j.femsec.2004.11.003>

¹⁴ Hermann, B. G., Debeer, L., De Wilde, B., Blok, K. & Patel, M. K. (2011) To compost or not to compost: Carbon and energy footprints of biodegradable materials' waste treatment. *Polymer Degradation and Stability*, 96(6): 1159–1171 <https://doi.org/10.1016/j.polymdegradstab.2010.12.026>

¹⁵ Boldrin, A., Andersen, J. K., Møller, J., Christensen, T. H. & Favoino, E. (2009) Composting and compost utilization: accounting of greenhouse gases and global warming contributions. *Waste Management & Research*, 27(8): 800–812. <https://doi.org/10.1177/0734242X09345275>

¹⁶ Zhao, H., Themelis, N., Bourtsalas, A. & McGillis, W. R. (2019) *Methane emissions from landfills*. Columbia University https://www.researchgate.net/publication/334151857_Methane_Emissions_from_Landfills

¹⁷ Nair, S. K. (2022) *Back to Earth. Composting for various contexts*. GAIA - Global Alliance for Incinerator Alternatives. https://www.no-burn.org/wp-content/uploads/2022/01/Back-to-Earth-Organics-Manual_Spread.pdf

¹⁸ United Nations Environment Programme and Climate and Clean Air Coalition (2021) *Global Methane Assessment*.

¹⁹ Paul, A. S. (2021) Thanks to high LPG price, homemakers turn to biogas. *The Hindu*, 11 September 2021 <https://www.thehindu.com/news/cities/Thiruvananthapuram/thanks-to-high-lpg-price-homemakers-turn-to-biogas/article36401902.ece>

However, it is worth highlighting foreseeable AD pitfalls such as landfilling AD digestate, flaring AD biogas instead of using it as fuel, burning fossil fuels to increase processing temperatures, digesting new, energy-intensive agricultural crops rather than organic discards, and perceived or actual competition with renewable wind and solar energy. It is also critical to ensure the correct operation of AD facilities to achieve financial sustainability and avoid any leaks of methane into the atmosphere once generated. AD, therefore, can work well with a clean organic waste stream in certain areas with appropriate operational capacity, but, like composting, needs to be integrated into an overall zero waste system that prioritizes prevention.

5. Bio-stabilisation of residuals

Given that some organic discards will remain in residual waste streams even after source separation and treatment of organics, residual waste should never be landfilled without first undergoing biological stabilization. This can include simple mixing and aeration techniques or more complex material recovery and biological treatment (MRBT) systems. In this way, bio-stabilisation provides a final screen for organic material, including contaminated or “dirty” organics still in the residual waste stream.

6. Remediation: Biologically active cover and landfill gas capture – to be implemented as a last resort

Even when complete diversion of organics is achieved, ongoing methane emissions from past discards buried in landfills will still need to be addressed, as landfills continue to emit methane for decades after they have stopped accepting new waste.²⁰ Fortunately, active landfills are responsible for the majority of emissions and emissions from closed landfills – also known as legacy emissions – only represent about 9% of the problem.²¹ A growing body of research suggests that biologically active cover – a layer of compost or other organic material over landfills – can greatly reduce these emissions. By fostering communities of microbes that digest methane as it rises from the landfill below, biologically active cover can reduce landfill emissions by 63% on average.^{22,23,24,25} Depending on environmental conditions, it can even generate “negative” emissions by drawing down methane from the atmosphere.^{26,27} On the other

²⁰ Agency for Toxic Substances and Disease Registry (2001) *Landfill gas primer: An overview for environmental health Professionals* <https://www.atsdr.cdc.gov/hac/landfill/html/ch2.html>

²¹ Powell, J. T., Townsend, T. G. & Zimmerman, J. B. (2016) Estimates of solid waste disposal rates and reduction targets for landfill gas emissions. *Nature Climate Change*, 6(2): 162–165 <https://doi.org/10.1038/nclimate2804>

²² Boldrin, A., Andersen, J. K., Møller, J., Christensen, T. H. & Favoino, E. (2009) Composting and compost utilization: Accounting of greenhouse gases and global warming contributions. *Waste Management & Research*, 27(8): 800–812. <https://doi.org/10.1177/0734242X09345275>

²³ Lou, X. F. & Nair, J. (2009) The impact of landfilling and composting on greenhouse gas emissions—a review. *Bioresource Technology*, 100(16): 3792–3798 <https://doi.org/10.1016/j.biortech.2008.12.006>

²⁴ Stern, J. C., Chanton, J., Abichou, T., Powelson, D., Yuan, L., Escoriza, S. & Bogner, J. (2007) Use of a biologically active cover to reduce landfill methane emissions and enhance methane oxidation. *Waste Management*, 27(9): 1248–1258. <https://doi.org/10.1016/j.wasman.2006.07.018>

²⁵ Barlaz, M. A., Green, R. B., Chanton, J. P., Goldsmith, C. D. & Hater, G. R. (2004) Evaluation of a biologically active cover for mitigation of landfill gas emissions. *Environmental Science & Technology*, 38(18): 4891–4899 <https://doi.org/10.1021/es049605b>

²⁶ Lou, X. F. & Nair, J. (2009) The impact of landfilling and composting on greenhouse gas emissions—a review.

²⁷ Stern, J. C., Chanton, J., Abichou, T., Powelson, D., Yuan, L., Escoriza, S. & Bogner, J. (2007) Use of a biologically active cover to reduce landfill methane emissions and enhance methane oxidation.

hand, financial support for biocover could potentially create a perverse incentive to dispose of low-quality compost at landfills as a mitigation strategy, which should be avoided.

A final method for remediating methane emissions – which should only be explored after the implementation of zero-waste strategies – is gas capture from existing landfills. In this process, landfills are equipped with tubes that allow some of the landfill gas (LFG), which is composed of 35–50% methane,²⁸ to be collected and piped to the surface. From there it can either be flared or burned for energy, converting the contained methane to CO₂. Capture efficiencies can vary significantly, however, with 10–65% of the target methane escaping into the atmosphere²⁹ and additional fugitive emissions arising from leaky pipes and transportation infrastructure.^{30,31} LFG capture is more carbon-intensive than composting and AD³² and should be employed with caution. In some cases, financial incentives to collect LFG have motivated waste management companies or municipalities to redirect organic discards from diversion programs (such as animal feed or composting) back to landfills to increase LFG production.^{33,34}

7. Never acceptable: Incineration, co-incineration and other types of thermal treatments

Incineration should never be used to manage organic discards. Incineration is highly polluting, expensive and carbon-intensive, with large capital costs and high operational costs incurred from covering pollution control, air quality monitoring, wastewater management and ash disposal.³⁵ These costs often lead to incineration facility closures and have drained municipal budgets of hundreds of millions to more than a billion US dollars in some cases,³⁶ compared with composting, which tends to have lower waste management costs and very low capital

²⁸ Johannessen, L. M. (1999) *Guidance note on recuperation of landfill gas from municipal solid waste landfills*. Washington DC, USA: International Bank for Reconstruction and Development/World Bank.

²⁹ Stanislavljević, N., Ubavin, D., Batinić, B., Fellner, J. & Vujić, G. (2012) Methane emissions from landfills in Serbia and potential mitigation strategies: a case study. *Waste Management & Research*, 30(10): 1095–1103
<https://doi.org/10.1177/0734242X12451867>

³⁰ The Landfill Gas Expert (2019) *Fugitive emissions of methane and landfill gas explained*
<https://landfill-gas.com/fugitive-emissions-of-methane-landfill-gas>

³¹ Inter-American Development Bank (2009) *Guidance note on landfill gas capture and utilization*
<https://publications.iadb.org/publications/english/document/Guidance-Note-on-Landfill-Gas-Capture-and-Utilization.pdf>

³² Barton, J. R., Issaias, I. & Stentiford, E. I. (2008) Carbon: Making the right choice for waste management in developing countries. *Waste management*, 28(4): 690–698 <https://doi.org/10.1016/j.wasman.2007.09.033>

³³ Global Alliance for Incinerator Alternatives (n.d.) *Clean development mechanism funding for waste incineration: Financing the demise of waste worker livelihood, community health, and climate*
<https://www.no-burn.org/wp-content/uploads/Clean-Development-Mechanism-Flyer.pdf>

³⁴ Global Alliance for Incinerator Alternatives (2013) *Recycling jobs: Unlocking the potential for green employment growth*.
<https://www.no-burn.org/wp-content/uploads/2021/03/Recycling-Jobs-Unlocking-Potential-final.pdf>

³⁵ Global Alliance for Incinerator Alternatives (2021) *The high cost of waste incineration*
www.doi.org/10.46556/RPKY2826

³⁶ Global Alliance for Incinerator Alternatives (2021) *The high cost of waste incineration*.

costs.^{37,38,39} Incineration also fares very poorly from a climate perspective. While it can save methane emissions from organic discards, it generates huge amounts of fossil-based CO₂ when plastics and synthetic textiles burn in mixed municipal waste.⁴⁰ When used for energy production, so called “waste-to-energy” incinerators generate more GHG emissions per unit of energy produced than any other energy source.⁴¹ Finally, organic waste content in residual waste is not desirable from the operator's point of view, since organic waste is high in moisture and lowers the temperature of the flare which drives up the generation of pollutants that need to be abated at a high cost. For all these reasons, source separation and treatment of organic discards is always preferable to LFG capture and incineration.

Checklist

- Implement waste management systems with provisions for climate change resilience and adaptation, along with maximizing resource recovery.
- Amend policies at national, regional and local level to integrate implementation of priorities of the waste hierarchy as described in this document.
- Include specific measures to reduce waste and resource use and move towards intergenerational equity, particularly in affluent contexts in developed countries.
- Include specific measures to divert and ultimately ban untreated and/or unstabilised organic waste from landfills and maximize recovery through source separation and separate collection systems.
- Allocate a budget for local governments to implement composting systems, anaerobic digestion, and other material recovery solutions and provide for subsidies to citizens and small businesses for organics recovery.
- Introduce a moratorium for new incinerators and set up a progressive phase out of existing waste-to-energy incineration facilities.
- Implement institutional green procurement strategies that include avoidance of single use plastic, set up of reuse systems, requirements to use compost instead of chemical fertilizers in urban gardening and landscape, and overall shrink of resource use.

³⁷ The New School Tishman Environment and Design Center (2019) *US solid waste incinerators: An industry in decline*. https://grist.org/wp-content/uploads/2020/07/1ad71-cr_gaiareportfinal_05.21.pdf

³⁸ Tavernise, S. (2011) City council in Harrisburg files petition of bankruptcy. *The New York Times*, 12 October 2011. <https://www.nytimes.com/2011/10/13/us/harrisburg-pennsylvania-files-for-bankruptcy.html>

³⁹ Morris, J. (2005) Comparative LCAs for curbside recycling versus either landfilling or incineration with energy recovery. *The International Journal of Life Cycle Assessment*, 10(4): 273–284 <https://doi.org/10.1065/lca2004.09.180.10>

⁴⁰ Tangri N (2023) Waste incinerators undermine clean energy goals. *PLOS Clim* 2(6): e0000100. <https://doi.org/10.1371/journal.pclm.0000100>

⁴¹ Tangri, N. V. (2021). Waste incinerators undermine clean energy goals. *Earth ArXiv* <https://doi.org/10.31223/X5VK5X>

Source separation of organic waste

Waste separation at source and separate collection is a fundamental policy that determines the quality of food waste recovery and other high impact treatments explained above. A key example of waste separation policy is the 2018 amendment to the EU's Waste Framework Directive which has set promising goals for organic waste management in all 27 EU member states. The Directive's mandate to separately collect all organic waste by the end of 2023 has already driven significant increases in separate collection rates and the European Commission is planning to adopt the additional goals of reducing food waste by 50% by 2030 and developing legally binding targets for food waste reduction.^{42,43}

Even with effective waste prevention programs in place, some organic waste will still be generated. For this discarded material, source separation – where organic discards are separated out from other waste at their point of generation (homes, businesses etc.) – is critical. Source-separated organic waste needs to be separately collected, ensuring a clean stream of organic material ideal for high-impact treatment methods such as composting, AD and diversion to animal feed, which can be done on site, at decentralized community-scale facilities, or at larger centralized facilities depending on local capacities and needs.

Waste Prevention: How Do We Avoid Food Loss and Food Waste

Waste prevention, at the top of the waste hierarchy, normally involves a set of policies that are often conceived outside the specific realm of waste management. Waste prevention involves reducing the production of disposable products, redesigning of products to maximize their reusability and recyclability and enabling the reduction of resource use overall. In this way, waste prevention policies are also beneficial for climate change mitigation and adaptation, and contribute to the goal of sustainability: covering basic needs and well-being for all without lack or excess, and investing in reuse systems while reducing and avoiding over-consumption, particularly of single use products.

All these policy instruments can have a great impact on food loss and food waste. Importantly, an increasing number of agroecology and composting networks have been organized in cities to recover organic waste and ensure community-based and decentralized management. These initiatives prioritize recovering food in good condition for food banks, overripe or highly damaged food for feeding farm animals, and decentralized composting. These initiatives need to be further incentivised and replicated with measures along the lines of:

1. Prepare and adopt a holistic plan that aims to reduce food loss and food waste within the frame of a wider transition to a sustainable food system which will ensure food safety and sovereignty;⁴⁴

⁴² European Union (2008) *Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives*

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02008L0098-20180705>

⁴³ European Commission (2021) *A farm to fork strategy*

https://ec.europa.eu/food/horizontal-topics/farm-fork-strategy_en

⁴⁴ Zero Waste Europe and Slow Food (2021) *Reducing food waste at the local level: Guidance for municipalities to reduce food waste within local food systems*

<https://www.slowfood.com/wp-content/uploads/2022/01/Guidance-on-food-waste-reduction-in-cities-EN.pdf>

2. Stimulate the local food system through community-supported agriculture and initiatives that reduce food loss at the primary level;
3. Create a local food environment that encourages a wide-range of public and private actors to develop food waste prevention activities;
4. Raise awareness and educate about the value of food beyond its appearance through educational programs or impacting campaigns stimulating citizens to reduce food waste;
5. Develop a proper bio-waste management system to ensure food waste is valorised into fertilizer in case it cannot be prevented.

2. Protect the livelihoods of waste pickers and waste workers to deliver just transition.

Millions of people worldwide make a living collecting, sorting, recycling and selling materials that someone else has thrown away. In some countries and localities, waste pickers provide the only form of municipal solid waste collection and recycling, providing widespread public benefits and achieving high recycling rates. Waste pickers contribute to local economies, to public health, safety and to environmental sustainability. While recognition for their contributions is growing in some places, they face low social status often based on occupation, race, caste, etc., deplorable living and working conditions and get little support from local governments. Increasingly, they face challenges due to privatization of waste management systems. It is important to raise the visibility of waste pickers and other workers in informal and cooperative settings and recognise their fundamental human dignity, and their historic contribution and continuing role.

A just transition for the waste sector means reducing methane emissions in a way that is fair and inclusive to everyone. It must move society towards an environmentally sustainable economy, including elements of decent work for all, social inclusion, social protection, more training opportunities, appropriate technology transfer, support for infrastructure and organizing of workers, and greater job security for waste pickers and waste workers. The just transition framework should emphasize supporting waste pickers and other workers who are most vulnerable to occupational disruption from waste management investments and climate change.

Ultimately, waste management needs to be recognised as an essential public service that must be guaranteed by the state. Policies must aim to maximize the social and economic opportunities of ending pollution while minimizing and carefully managing any challenges – including through effective social dialogue among all groups impacted, and respect for fundamental human rights.

A government or local authority should consider the following potential approaches:

- As the most vulnerable stakeholders in the waste system, waste pickers merit explicit mention and recognition, so existing legal frameworks need to integrate: Universal

Declaration on Human Rights, FPIC, UNDRIP (UN declaration on the rights of indigenous peoples) etc. and other relevant treaties such as the ILO on informal workers that cover the waste pickers and the waste recyclers.

- Establish a mechanism to ensure an equitable, inclusive and just transition for waste pickers and other workers affected by shifts in systems and policies in all countries – not just developing ones.
- Improve working conditions for waste workers and waste pickers in value chains, which includes providing legal recognition and support for informal waste pickers, such as access to health care, education and social security benefits.
- Recognise the role of waste pickers in value chains and promote a circular economy by establishing partnerships with waste pickers (associations, cooperatives and self-employed) for recovery of organic waste through just transition programs.
- Ensure that the autonomy and aspirations of waste pickers, and their associations and cooperatives are accounted for while planning a just transition through a universal survey of waste pickers and social dialogue. Waste picker surveys are essential for identifying who to bring to the table in the planning and implementation of new systems, and social dialogue is key to a just transition.
- Reporting by member states and producers on engagement and partnerships with waste pickers with regards to waste management, the extension of social welfare provisions and increases in waste picker income. Mandatory reporting will ensure that a just transition is in place, and will help member states learn from one another about how to best support vulnerable workers in their waste systems.
- Building capacities of government functionaries, especially grassroot level officials, on considering waste pickers as one of the important stakeholders.
- Design and develop recycling systems that prioritize and build upon to strengthen the existing informal sector rather than displacing it.
- Do no harm: any intervention cannot make their situation any worse. In short, this principle is about ensuring that interventions in one community do not harm another. In practical terms, this principle would provide a checklist of questions to be considered and answered around any potential harm to any other community.

Furthermore, this principle provides guidance on how to identify the relevant stakeholders and rights holders, following equity and justice criteria. This would involve prioritizing and ensuring that all historically marginalized organizations and community representatives are identified, informed and consulted appropriately. It would entail adopting and encouraging decentralized solid waste management systems for managing municipal waste, which allow for wider public participation and integration of the informal sector.

Centering justice and equity places focuses on identifying the right stakeholders through restorative justice criteria, so that the diversity of people and cultures is recognised, and that human-rights based participation in the political processes that create, manage and implement environmental policy are assured. Importantly, every and all waste management projects should be put forward with consultation and meaningful participation of all waste workers and waste pickers. This is particularly important in those contexts where waste pickers are unfortunately not guaranteed basic human rights such as the right to life and human dignity.

Checklist

- Recognise that waste management is an essential public service that needs to be guaranteed and financially backed by state/governments with appropriate allocation of resources.
- Recognise the principle of no-harm – that is, the legal, social and ethical rights of, and assessing the risks to, all stakeholders and rights holders with a special focus on vulnerable communities.
- Commit to developing a just transition framework in the waste sector with specific measures, focusing on prioritizing and supporting waste pickers and other workers who are most vulnerable to occupational disruption from waste management investments and climate change.
- Recognise the essential rights of identity, dignity and livelihood for all waste pickers and waste workers.
- Improve working conditions for waste workers and waste pickers in value chains including by providing legal recognition and support for informal waste pickers, such as access to health care, education and social security benefits.
- Establish partnerships with waste pickers (associations, cooperatives and self-employed) for recovery of organic waste through just transition programs.
- Ensure that autonomy and aspirations of waste pickers, and their associations and cooperatives are accounted for while planning a just transition through a universal survey of waste pickers and social dialogue.
- Implement a system to identify, recognize and integrate waste pickers and waste workers to ensure their meaningful participation in the process of just transition.
- Introduce mandatory reporting by member states and producers on engagement and partnerships with waste pickers in regards to: plastic waste management, the extension of social welfare provisions and increases in waste picker income; Mandatory reporting will ensure that a just transition is in place, and will help member states learn from one another about how to best support vulnerable workers in their waste systems.
- Build capacities of government functionaries, especially grassroot level officials, on considering waste pickers as one of the important stakeholders and work more closely with them to ensure their integration in the overall local waste management system.
- Design and develop recycling systems that build upon and strengthen the existing informal sector rather than displacing it.

3. Include local organizations and communities in the decision-making process.

Rooting environmental interventions in their local context is a fundamental pillar. Respecting local knowledge is paramount: changes to waste management and to materials management in general should be built from the community's expertise and traditional practices. In seeking to add value to existing local work, instead of replacing it, waste management projects should be decentralized, replicable and adaptable to geographically and culturally diverse needs and situations.

This principle is about ensuring that the process is both properly inclusive and builds inclusion further in the decision-making process. It looks at what decisions need to be made, how they will be made, who will be at the table, how disadvantaged communities are enabled to participate, etc. The specific outworking in how a just transition process will look like will depend on local context and local consultation.

Some ideas on how inclusion and meaningful participation of local organizations and communities should be pursued are as follows:

- Creating institutional mechanisms and building capacity at the institutional level with dedicated staff working on engagement/inclusion, taking the responsibility to hold local meetings and reach out through various ways to expand participation and ensure measurable community engagement
- Setting up systems to support the participation by a broader diversity of people or specific communities (considering timing of meetings, form of meetings, family support services, babysitting, languages, honorarium/ stipends, addressing accessibility issues, cultural training, providing translation – in meetings and of documents – having multilingual organizers and tech support for meaningful participation, etc.).
- Designing discussions and consultations for inclusion, in order to create conditions for voices to be heard, being aware of cultural circumstances and pre-existing inequalities including technology access, educational attainment and disability.
- Building capacity and providing technical expertise in local, vulnerable and impacted communities to ensure inclusion and meaningful participation with decision-makers.
- Give priority, emphasize and promote integration of waste pickers and waste workers, outlining how local knowledge of waste pickers and waste workers must be brought into the process for learning. For example: informal recycling collection routes.
- Recognising local expertise on the treatment of organic waste, e.g. different ways of composting, or other types of wastes; empower the local community with skills and finance to design and implement customized waste management related projects at local level with the support of local self governments.

- On-going relationship building and resource investments to develop trust with communities; assessment of successful community-based projects followed by scalability and financing – with promises to fulfill.
- Strengthen the Environmental Impact Assessment (EIA) process to incorporate EJ principles.
- International finance needs to be accessible at the local level, so that implementation can be led by frontline communities and organizations.

Checklist

- Create institutional mechanisms and build capacity at the institutional level with dedicated staff working on engagement/inclusion who take responsibility for holding local meetings and reaching out through various ways to expand participation and ensure measurable community engagement.
- Set up systems to access information, reports and documents prior to consultation with adequate time to get informed with transparency and accessibility to support the participation by a broader diversity of people or specific communities (timing of meetings, form of meetings, family support services, babysitting, languages, honorarium/ stipends, addressing accessibility issues, cultural training, providing translation – in meetings and of documents – having multilingual organizers and tech support for meaningful participation, etc.).
- Design discussions and consultations for inclusion, creating conditions for voices to be heard, and being aware of cultural circumstances and pre-existing inequalities including technology access, educational attainment and disability.
- Build capacity and provide technical expertise in local, vulnerable and impacted communities to ensure inclusion and meaningful participation with decision-makers.
- Give priority to, and emphasize and promote the integration of, waste pickers and waste workers, outlining how their local knowledge must be brought into the process for learning; For example: informal recycling collection routes.
- Recognise the local expertise on the treatment of organic waste, e.g. different ways of composting, or other types of wastes; empower the local community with skills and finance to design and implement customized waste management related projects at the local level with the support of local self governments.
- Strengthen the Environmental Impact Assessment (EIA) process to incorporate EJ Principles.
- Create local access to international finance so that implementation can be led by frontline communities and organizations.

4. Include mechanisms for compliance and accountability to do no harm.

In terms of accountability, standards for financial institutions and project promoters must adopt a clear set of criteria and guidelines for developing methane reduction projects. Before a project begins, a plan for complying with all project-related obligations must be developed including both incentives and sanctions. Steps should be taken to end corrupt practices.

Moreover, it is commonly accepted practice that those who produce pollution should bear the costs of managing it to prevent damage to human health or the environment. In practical terms, effective tools will include setting up effective sanction mechanisms and making sure no parties can externalize social and environmental costs.

In this sense, developing Extended Producer Responsibility legislation ensures producers are responsible for the life cycle of products and should include waste prevention measures at the design stage of products. While EPR has not proven effective at reducing pollution, it can ensure that the polluter pays, with specific legislation setting targets, metrics, fees and penalties to keep polluters accountable.

In practical terms, basic tools to consider are:

- Gaining public acceptance: any methane reduction plan in the waste sector should demonstrate that it has “demonstrable acceptance” of the affected people, and the free, prior and informed consent of affected indigenous and tribal peoples.
- Setting up feedback mechanisms and periodical reports. This could create a committee with representation of the different right holders to supervise the proper application of the EJ principles in the decision-making process and to interventions in the waste sector in a given context.
- Set up mechanisms to ensure that those responsible for environmental harm and pollution are held accountable.
- Where governments have allowed an area to become a “sacrifice zone” – an area where public health is harmed by levels of pollution exceeding the government’s own limit of acceptable risk, a revisioning process must be put in place acknowledging the ongoing harmful development.
- Make the proximity principle a priority: waste should be managed as near as possible to its place of production and exporting waste to countries without effective waste management systems or environmental legislation and regulations – known as waste colonialism – must end.
- Where pollution has impacted negatively the value of homes and made moving elsewhere unaffordable, provisions need to be made to cover for the necessary relocation.

Checklist

- Adopt a clear set of criteria and guidelines for developing methane reduction projects including mechanisms that will ensure compliance and accountability, incentives and sanctions and end corrupt practices.
- Develop EPR legislation to ensure producers are responsible for the life cycle of products and include waste prevention measures at the design stage of products that can be effective measures; EPR must ensure that the polluter pays, with specific legislation setting targets, metrics, fees and penalties to keep polluters accountable.
- Commit to the preventive and precautionary principles: the first addresses tangible risks, while the latter deals with scientific uncertainty – when there are threats of damage to people or the planet, then lack of full scientific certainty cannot be used to delay cost-effective measures to stop such harm, and policies to prevent use and release of toxic chemicals (pesticides, PFAS, brominated fire retardants, etc.) must be put in place.
- Gain public acceptance: any methane reduction plan in the waste sector should demonstrate that it has “demonstrable acceptance” of the affected people, and the free, prior and informed consent of affected indigenous and tribal peoples.
- Set up feedback mechanisms and periodical reports to ensure that environmental harm and pollution are held accountable – this could take the form of a committee with representation of the different right holders to supervise the proper application of the EJ principles in the decision-making process and intervention in the waste sector in a given context.
- Implement a revisioning process acknowledging the ongoing development that has been harmful in places where governments have allowed an area to become a “sacrifice zone” – an area where public health is harmed by levels of pollution exceeding the government’s own limit of acceptable risk.
- Set up a global regulatory toolbox to manage chemicals in material cycles (or circular economy by extension) that is binding, and implement globally harmonized requirements for transparency of information on chemical identities that can be traced and linked to individual materials and products.
- Make the proximity principle a priority: waste should be managed as near as possible to its place of production and exporting waste to countries without effective waste management systems or environmental legislation and regulations – known as waste colonialism – must end.

5. Design climate interventions within a multidimensional framework

The waste and climate crisis are not only environmental issues and they are closely interrelated with other social and economic crises, thus, building towards and exceeding the Sustainable Development Goals.

Waste policies and projects are not solely environmental – they have a significant cross-sectoral dimension and a great impact on social and economic dimensions, given that they are linked to critical issues such as poverty, gender injustice, inequality, conflict and war. Importantly, waste issues are the result of political decisions related to economics, governance, power dynamics and culture, amongst other factors.

In practical terms, this principle will encourage policymakers and practitioners not to work in silos and ensure that key performance indicators (KPI) for projects have multi-dimensional criteria, not only looking at the quantification of methane emission reductions, for example, but just as importantly looking at job creation, local economy, public health, community development, etc. Addressing methane emissions in non-systemic ways runs the risk of trading one problem for another e.g., exchanging methane emissions with carbon dioxide emissions resulting from waste-to-energy incineration.

Alliances and the development of common strategies between committed public authorities/institutions should be promoted. In practice, successful implementation of waste projects with EJ principles will be led by collaborations between civil society, local authorities, and governments, bringing together a wide range of stakeholders to build a political and visionary common ground that strengthens the quality of governance itself. Systemic solutions that address a community's problems as perceived by the community will win greater and more rapid acceptance and thus be implemented more quickly and fully.

Check list

- Strategic planning, policy development and general decision-making for implementation in the waste sector must recognise that the waste sector is not solely environmental but has a significant cross-sectoral dimension and a great impact on social and economic dimensions
- Encourage policymakers and practitioners not to work in silos and ensure that key performance indicators (KPI) for projects have a multi-dimensional criteria, not only looking at the quantification of methane emission reductions, for example, but just as importantly looking at job creation, local economy, public health, community development, etc.
- Establish alliances and the development of common strategies between committed public authorities/institutions should be promoted
- Implement waste projects with EJ principles led by collaborations between civil society, local authorities and governments, bringing together a wide range of stakeholders to build a political and visionary common ground that strengthens the quality of governance itself

References

Practical roadmaps and guidelines on implementing zero waste strategies:

- [The Zero Waste Masterplan: A Guide to Building Just and Resilient Zero Waste Cities](#) (GAIA US and Canada, 2020)
- [Companion Guide for Organizers](#) (GAIA, 2020)
- [The Zero Waste Masterplan: Turning the vision of the circular economy into a reality for Europe](#) (Zero Waste Europe, 2020)
- [Reducing food waste at the local level: guidance for municipalities to reduce food waste within local food systems](#) (ZWE and Slow Food, 2021)
- [Back to earth: composting for various contexts](#) (GAIA, 2022)
- [Funding Zero Waste in Your Municipality: 3 Steps to Success](#) (GAIA, 2021)
- [Zero Waste City Manual. A Toolkit to Establish City and Community Zero Waste Systems](#) (Citizen consumer and civic Action Group (CAG), with GAIA and Break Free from Plastic, 2020).
- [My Zero Waste Event. 12 Actions to start a zero waste process](#) (Zero Waste Europe, Zero Waste France, 2018)

Relevant external reference documents and processes from close and aligned allies:

- Various EJ Declarations [here](#)
- [Principles of Environmental Justice, developed in Washington DC in 1991](#)
- [Jemez Principles for Democratic Organizing](#), developed in Jemez in 1996
- [Declaration Of The International Forum For Agroecology](#), developed in Nyéléni, Mali, 2015
- [Environmental Justice Leadership Forum on Climate Change](#)
- [Citizens' Guide To The World Commission On Dams](#) (p.15-16)
- [FoEI People Power Now Energy Manifesto- 10 demands for a transformed energy system](#)
- [FoEE- 7 Sparks to Light a New Economy: Transformational Ideas for a Life-Sustaining Economy Within Earth's Limits](#)

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GAIA's NDC Checklist

Guidance on integrating waste and methane reduction into the NDCs 3.0 in alignment with Environmental Justice Principles

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1958 University Avenue, Berkeley, CA, USA

GAIA is a network of grassroots groups as well as national and regional alliances representing more than 1000 organizations from 92 countries. With our work, we aim to catalyze a global shift towards environmental justice by strengthening grassroots social movements that advance solutions to waste and pollution. We envision a just, Zero Waste world built on respect for ecological limits and community rights, where people are free from the burden of toxic pollution, and resources are sustainably conserved, not burned or dumped.

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