



ENABLING SUSTAINABLE CITIES THROUGH

ZER WASTE

A GUIDE FOR DECISION- AND POLICY-MAKERS



When city planners put Zero Waste into action, they can establish resilient and sustainable cities, fulfill the SDGs, comply with RA 9003, and transition to a sustainable circular economy.



**Global Alliance For Incinerator
Alternatives (GAIA)**
www.no-burn.org

INTRODUCTION

This briefing paper presents a list of Zero Waste policy recommendations for local government officials as well as for national officials and policy makers in the Philippines.

The aim is to provide local and national decision- and policy-makers with a set of sustainable options that they can pursue when they lay out management systems for municipal solid waste in their areas of influence.

It comes at a time when city and municipal officials are faced with the golden opportunity to transform their localities into Zero Waste Cities—and in the process help them establish resilient and sustainable cities, help fulfill Sustainable Development Goal 11, comply with the Ecological Solid Waste Management Act or Republic Act (RA) 9003, and transition to a sustainable circular economy.

In the past few decades, we have seen increased understanding about environmental sustainability and the crucial role of cities and municipalities in its advancement. More recently, with all the current challenges associated with rapid urbanization, the importance of making cities liveable (“inclusive, safe, resilient and sustainable”) has been adopted as an important SDG (Goal 11).¹

There is global recognition that Zero Waste policies at the city and municipal level are among the crucial strategies for climate resilience as well as resource sustainability.² Many initiatives and programs centered

around ‘sustainable cities’ tackle how localities manage their resources and waste.

The city-led C40³ initiative, for example, has set forth a Zero Waste Declaration stating that “the sustainable, prosperous and liveable cities of the future will ultimately need to be zero-waste cities.”⁴ Although such initiatives are at their early stages and much change need to be done at the local level (even for signatory countries), these programs are sending a signal that the shift to Zero Waste has long begun.

Clearly, the term “Zero Waste Cities” is not just a buzz word or an unreachable pie-in-the-sky. US cities such as San Francisco, San Diego, and New York, as well as more than 400 cities and municipalities in the European Union, 16 cities in Asia, including four in the Philippines, are transitioning towards Zero Waste systems.⁵

The Philippines, likewise, has institutionally embraced Zero Waste, through Presidential Proclamation No. 760, which declared January as “Zero Waste Month.”

WHY GO ZERO WASTE?

Zero Waste presents a robust strategy to solve a waste crisis in a city.

It helps facilitate efficient segregation and collection systems, sets out doable and cost-effective solutions for the ecological management of organic waste, reduces consumption of wasteful products and packaging, and presents viable alternatives to landfilling and incineration, which are both acknowledged to be harmful, end-of-pipe, and expensive disposal technologies.

Implementing Zero Waste decreases pressure on the environment, mitigates climate change, reduces pollution, improves air quality, and supports local economic development and livelihoods.

Zero Waste strategies also support the achievement of Sustainable Development Goal #11 targets, namely:

11.6 - "reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management," and

11.B - "substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters..."⁶

RA 9003 law mandates the adoption of "a systematic, comprehensive, and ecological solid waste management program" which shall, among others:

- a. "Ensure the protection of public health and environment;
- b. Utilize environmentally-sound methods that maximize the utilization of valuable resources and encourage resources conservation and recovery;
- c. Set guidelines and targets for solid waste avoidance and volume reduction through source reduction and waste minimization measures, including composting, recycling, re-use, recovery, green charcoal process, and others, before collection, treatment, and disposal in appropriate and environmentally sound solid waste management facilities in accordance with ecologically sustainable development principles."

Currently, officials and lawmakers are grappling with the question of how to address growing waste volumes. What can they do within their capacity that can make significant positive impact on their city and constituents—without causing more environmental damage that will result from landfills or waste incineration?

This paper seeks to respond to this need: it aims to give local government leaders and policy makers recommendations for policies that put Zero Waste in action and implement RA 9003, while demonstrating that Zero Waste is both practical and achievable.

In the Philippines, Zero Waste strategies are the keys to successfully implementing RA 9003, or the Ecological Solid Waste Management Act.⁷

Local government leaders are at the center of this transformation—and with strong support from the national level—can provide much-needed political will to spearhead their city’s or municipality’s journey to Zero Waste.

ZERO WASTE: ‘RESOURCE MANAGEMENT’ VS ‘WASTE MANAGEMENT’

The concept of Zero Waste is a new wave of innovation in environmental planning and resource management.

It supersedes older and now-debunked models of waste management, particularly waste incineration, including waste-to-energy incineration and its variants such as pyrolysis, gasification, plasma arc, and refuse-derived fuels. Waste incineration is banned in the Philippines under RA 8749 or the Clean Air Act of 1999 and RA 9003.

In contrast to waste incineration, Zero Waste presents a holistic—and pollution-free—approach that facilitates a circular, closed-loop system, transforming the outdated concept of ‘waste management’ to ‘resource management.’

Simply put, Zero Waste is efficient resource management. It helps city planners unlock a path that avoids environmental destruction and its corresponding social, health, and economic impacts. Thus, it is a fundamental part of enabling sustainable cities.

“Waste management”: the old approach

Until the previous century, the concept of ‘waste management’ was to take the waste and make it ‘disappear’ by dumping in a landfill, or burning in a facility.

This concept is reflected in the way waste infrastructure was designed: as large-scale centralized facilities (landfills and waste incinerators), dependent on the hauling, delivery of large quantities of waste for disposal, and availability of land. These facilities are prohibitively expensive, and developing countries are often heavily reliant on loans for their construction.

The other drawback is pollution: landfills and incinerators produce harmful pollution.

Even the most technologically-advanced landfills leach out toxic chemicals. Similarly, waste incinerators are major sources of pollution, specifically cancer-causing dioxins and furans. These toxic chemicals are created during the burning process.

Modern waste incinerators still produce dioxins, furans, and heavy metal emissions. Their pollution control systems merely capture some (not all) of these toxic chemicals and transfer them to by-product ash and slag. Even the most advanced pollution control systems do not capture all the toxics, so that governments need to put pollution emissions standards in place. Moreover, the facility’s by-product ash or slag still need to be disposed of in a specially designed hazardous waste landfill that can handle ash. (For more information about fly ash, see Annex 2: Can Philippine cities deal with it?)

Irrespective of whether the design and maintenance are good or bad, waste incinerator facilities pose very serious health risks to surrounding communities, and contribute to the global load of persistent organic pollutants (POPs)—highly toxic chemicals subject to priority elimination under the Stockholm Convention.⁸

In other aspects of environmental sustainability, landfills and incinerators destroy resources rather than preserve them. This puts a lot of pressure on the planet—creating the need for more extraction and production, which are recognized as main drivers for much of the world’s environmental problems, including climate change.

Waste management was a model accepted in the 20th century. New thinking in 21st century, however, has revealed the pitfalls of the ‘linear economy’ where extraction and waste disposal were the norm. Now, with a clearer understanding about the need to transition to a sustainable ‘circular economy’ (where resources are conserved rather than destroyed), and the efficiency of decentralized systems, ‘resource management’ strategies are recognized as the right approach.

Resource management: the path for future sustainability

With the change of perspective from ‘waste’ to ‘resources,’ the aim of resource management is to make sure no waste is created in the first place.

Many countries are now moving towards ‘resource efficiency’ and are correspondingly changing their old waste systems (i.e. their dependence on landfills and incinerators) with the goal of resource preservation. In many countries and regions, this new approach is framed under the concept of the circular economy.



Segregated at-source collection of waste is crucial for the successful implementation of community Zero Waste program. Photo by Miko Alino

A circular economy is an economy “that does not waste and pollute, an economy that keeps products and materials in use and rebuild the natural capital of our ecosystems.”⁹ In this model, the value of materials is preserved, and extraction is minimized; waste prevention is the key and disposal is not considered a sound strategy.

At the heart of the circular economy is the Zero Waste approach.

This shift from ‘waste’ to ‘resources’ is also illustrated in the Waste Hierarchy, a ranking of resource and waste management approaches according to ecological sustainability.

Zero Waste approaches are located at the top of the hierarchy, indicating that these are the preferred actions, while disposal methods such as landfilling and incineration, including incineration with so-called ‘energy recovery,’ are located at the bottom.

Zero Waste actions at the top (reduction, reuse, and recycling) are upstream solutions, while disposal methods are end-of-pipe approaches that fail to address the problem at root.

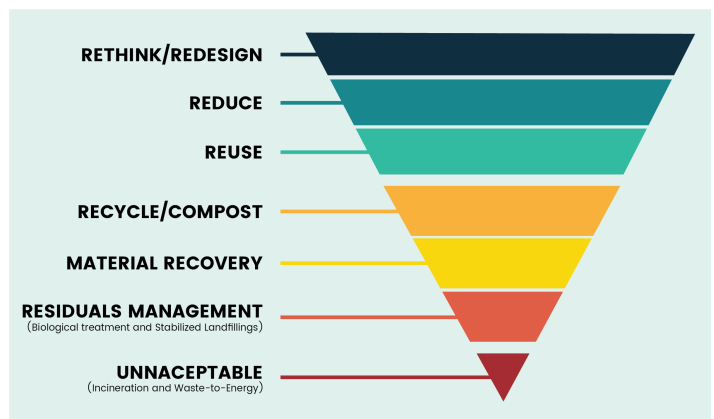


Figure 1: The Zero Waste Hierarchy was developed by the Zero Waste International Alliance. This is a detailed and effective approach that focuses on eliminating wastage instead of relying on incinerators or landfills. Thermal treatment or incineration of waste, including WTE incineration, is considered not acceptable in this hierarchy. From: <http://zwia.org/zwh/>

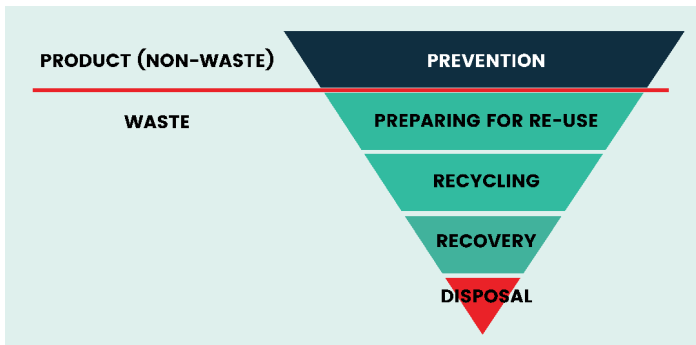


Figure 2: In this hierarchy, waste prevention (reduction), reuse and recycling are on top and are considered the priority actions for any waste legislation and policy by EU countries. "Recovery" (in some European Commission [EC] documents, this is referred to as "Other Recovery"), is a euphemism for "waste-to-energy," and is the second least desirable option for waste treatment. The EC advises member countries to prioritize prevention and other actions at the top of the hierarchy, and the presence of "recovery" and "disposal" as options (albeit least desired actions) is recognized an obstacle to the effective implementation of the priority actions. Source: European Commission.

WASTE IN THE PHILIPPINES

Waste in Philippine cities and municipalities is mostly composed of organics (52%). Recyclables comprise 28%, and residuals (waste that can't be re-used, recycled, or composted) 18%.¹⁰

Much of the waste (80%, which is organics and recyclables combined) can be safely returned back to nature or industry without resorting to landfills and incineration.

With proper segregation, organics can be composted or digested (through anaerobic

digestion) in household, business, or community facilities. Instead of being wasted, the organic portion of the waste is now turned into a resource: converted into compost fertilizer, and in the case of anaerobic digestion, renewable energy. Recyclables (glass, cardboard, metals) can either be reused or recycled.

What is left is a small percentage of mostly non-recyclable plastic waste. Under a Zero Waste approach, plastic residuals should not end up in landfills (where they contaminate the earth for future generations), or burnt in incinerators including so-called "waste-to-energy" (WTE) incinerators (where they are converted into carcinogenic air, water and soil pollution).

Instead, we have to make sure that materials that can't be composted, digested, reused, nor recycled (such as disposable implements or throwaway sachet packaging) are not produced in the first place.

The task for national policy makers is then to ensure that businesses design single-use plastic waste out of the system.

This means instituting policies to make sure cities and municipalities aren't burdened with this waste. Policies such as extended producer responsibility (EPR), plastic bag bans, and instituting alternative delivery systems to eliminate sachets (for example, the DENR project, Refill Revolution Reloaded¹¹) can go a long way in drastically reducing residual waste from single-use plastics.

Throwaway plastic packaging: a huge burden on cities and municipalities—and Filipino taxpayers

Corporations are profiting by the billions from unrecyclable plastic sachets—but cities and Filipino citizens are footing the bill to clean them up.

The burden of waste management is borne by cities and municipalities who have the responsibility to design and implement the systems for waste collection and disposal, and shoulder the corresponding costs. In Metro Manila, local governments spend as much as 24% of their budgets just on waste collection, mostly on contracting private hauling companies.¹²

In the case of plastic packaging, much of this waste is the result of poor packaging and product design or delivery. Examples include throw-away plastic packaging such as sachets used almost universally by manufacturing companies, and single-use cutlery, plates and cups, etc, used by eateries and fast-food establishments.

Eventually, with strong national policies and strong support from national decision makers, cities and municipalities can reduce residual plastic waste to zero. In the meantime, they can drive change by issuing local bans on single-use plastics and incentivizing alternative delivery systems.

This will also drastically reduce, and hopefully eliminate, a city or municipality's dependence on landfills and incinerators.

Companies designed these disposable products, which have helped them earn billions of pesos from marketing these in cheap, throwaway single-use sachets or flexible packaging. Similarly, eateries and fast-food establishments that use disposable cutlery, straws and plates to sell their food, are actually passing on the job of cleaning up the utensils to the city or municipality. (If they used reusable containers, they would be the ones to do the job of cleaning or washing these containers for further re-use.)

Yet, companies, fast-food establishments and eateries are not mandated to have any responsibility—or even shoulder the cost—for the management and disposal of these disposable products. It is the city or municipality which is left to do the job and shoulder the costs involved through taxpayer money.

The final burden of managing these waste products are left to cities that had no hand in the design or use of these products in the first place, and did not profit from their marketing. Local governments have little or no choice but to spend millions of pesos on waste disposal, as well as deal with waste products' negative environmental and health impacts on their cities and constituents.

POLICY RECOMMENDATIONS

Many cities and municipalities across the Philippines (for example, the City of San Fernando, Pampanga, and Tacloban City), as well as hundreds more around the world, have started the transition toward Zero Waste.

The biggest factor for the success and sustainability of these Zero Waste Cities is putting the right policies in place.

This section will first discuss RA 9003 in order to show how Zero Waste approaches facilitate the implementation of this law.

The second part of this section will then list recommended Zero Waste policy actions that national and local government leaders can pursue. These policy actions will not just help city and municipal leaders to effectively implement RA 9003, but also chart the way towards creating sustainable, liveable, and resilient cities.

The list of policies in this report is not comprehensive, but merely provides an overview of options. This is because details will vary from region to region, city to city, and barangay to barangay.

It is important to remember that Zero Waste must be grounded on local realities for it to be successful. And most important, community participation and empowerment is key for the plans to succeed in the long term.

Implementing RA 9003

The Ecological Solid Waste Management Act of 2000 is the guiding law for proper solid waste management in the country. It is globally acknowledged as a landmark legislation for environmental protection.

The law mandates that cities and municipalities must have a 10-year solid waste management plan, enforce segregated at-source collection of waste, establish materials recovery facilities, close open dumps, and dispose of residual waste in engineered sanitary landfills.

Under the law, "primary enforcement and responsibility of solid waste management" remain with local government units. The barangay is held responsible to collect the segregated garbage and further sort it at a materials recovery facility (MRF). The responsibility of the municipal government is to haul any remaining residual waste, which will then be brought to a sanitary landfill.

The law encourages cooperative effort among the national government units, other local government units, non-government organizations, and the private sector.

Notably, the law reinforces the national ban on waste incineration and recognizes that waste incineration is not an ecological approach to waste management.

In the past several years, much attention has been focused on the compliance of local governments to the law. Since 2016, cases have been filed against municipalities that have been deemed not compliant, particularly in closing down open dumps. Local government officials have been reported in media to have said that compliance was difficult. Many local government officials have been sued or suspended. In 2018, Ombudsman Samuel Martires recalled the suspension (for the non-implementation of RA 9003) of mayors and local government officials, saying that the law needs to be revisited as it is not economically feasible.¹³

However, work by GAIA and member organizations in many cities in the Philippines has shown that these challenges are more perception than reality. Instituting Zero Waste strategies, as manifested in actual and successful experiences of Philippine cities and municipalities, proves that implementing RA 9003 is not difficult nor expensive.

As long as the right strategies are in place, cities can successfully set up systems that will enable successful Zero Waste implementation within a period of as short as six months—while also achieving very significant savings in waste management costs.

Facilitating RA 9003 through practical and cost-effective Zero Waste systems

GAIA believes that there is a lack of information available to local government and national officials about practical strategies and policies that can help them enact RA 9003.

Other limitations are resistance to waste and resource management decentralization. Many cities and municipalities are still locked into the thinking that the only way to manage waste is through large-

scale centralized services and facilities, often designed by foreign companies in contexts very different to ours. There is also the belief that it is not possible to compel households and business establishments to follow segregation-at-source.

However, many cities that have pursued Zero Waste approaches are showing that RA 9003 can be successfully implemented with little difficulty—and at the fraction of the cost of centralized waste systems.

Through practical and doable Zero Waste systems, local governments hold the key to better, more sustainable waste management, and compliance to RA 9003.

The Zero Waste City of San Fernando, Pampanga

One example is the City of San Fernando in Pampanga. The city initially signed a contract with a private company to build and operate a WTE incinerator, with a promise that the city will not spend anything other than donating a piece of land. After learning about the negative impacts of burning waste, and considering that the facility has failed to operate as promised in three years, the city instead opted to adopt a Zero Waste system in partnership with the NGO Mother Earth Foundation.

In a span of six months, the city was able to drastically reduce the volume of municipal waste.



Segregated waste in the MRF of Pilar Village, City of San Fernando, Pampanga. Photo by Khate Nolasco

In the past, the city brought almost 90% of its waste to landfills. In the last five years, with a Zero Waste program which includes segregation at source and composting of organics, this figure was reduced to 30%.

This also resulted in huge savings for the city. San Fernando, for instance, would be spending around PHP 70 million for waste management if it were to haul all of its waste to the nearest landfill. Thanks to its Zero Waste program, the city was able to cut down its waste management cost to about PHP 15 million a year. Likewise, the city also improved its waste diversion rate from 12% in 2012 to 76% in 2017.¹⁴

One barangay, Maimpis, for example, reported savings following the implementation of a Zero Waste program. The barangay used to spend PHP 700,000 for hauling and fuel for waste disposal, but it now managed to bring expenses down to just PHP 400,000.¹⁵

As part of the system, the city included waste pickers in the collection scheme, creating more income opportunities for these workers in the form of regular salaries and sales from recyclable materials.

More importantly, waste workers, together with youth groups, government officials and NGOs, are represented in the city's solid waste management board and are involved in decisions related to the city's overall waste management program.

Segregation-at-source and collection in Tacloban City

Following San Fernando's footsteps, Tacloban City has improved its waste management services by adopting a decentralized collection system.

In the past, the city, which generates about 200 tons of waste per day, was only able to collect waste from 30% of its households, due to limited resources.

In partnership with Mother Earth Foundation and the Global Alliance for Incinerator Alternatives (GAIA) and through funding from the Plastics Solutions Fund, they started the implementation of a decentralized collection system in 17 barangays in March 2018.

In just nine months, the door-to-door collection has expanded to 63 barangays. The remaining barangays are serviced by the city government, and collection coverage from households is now almost 100%.

As part of its Zero Waste program, landfill-bound waste was reduced to 120 tons per day by December 2018, from 174 tons per day in December 2017. The drop in waste volume translates to as much as PHP 21 million in savings from hauling and tipping fees.¹⁶

The system also enabled hauling trucks to reduce their trips from 17 to eight trips daily, even as the city widened their collection coverage.

Seen through the lens of Zero Waste approaches, RA 9003 is a boon, not a burden, to local governments.

Zero Waste policies in practice

The following section lays out the secrets to success to creating Zero Waste Cities and provides a sampling of enabling policies that can be pursued by local government leaders, as well as national policy- and decision-makers.

Recipe for successful Zero Waste systems

Zero Waste systems in the Philippines have been proven to be most effective when the following elements are present:

1. Strong implementation and enforcement support

Experiences in Zero Waste cities have shown that while it is important to put a system in place, it is equally important to ensure that the system is consistently implemented and enforced, and supported at all levels of local government.

People need to be aware of the system, appreciate its importance and benefits, and should be fully informed of its 'rules.' In implementing the system, the local government

should constantly reinforce why it's important, show its benefits, as well as strictly and consistently enforce it. The more people are informed and consulted, the more they will feel part of the Zero Waste system and care for it to succeed.

For example, in the City of San Fernando, as well as in Malabon City, among others, stakeholder consultation and house-to-house information and education campaigns were conducted as part of the implementation of the Zero Waste system.

Waste collectors and monitors, with firm support from the barangay and local government, ensure that strict enforcement is in place. Unsorted waste is not collected, and households and establishments that do not follow segregation at source are given tickets, and fined, and are called to the barangay hall for a reorientation on the Zero Waste program.¹⁷

2. Decentralization of waste collection

Decentralization has been key to the success of the programs. Garbage hauling is done per barangay, with waste workers that are able to establish relationships with households. This personal interaction (aside from information campaigns and penalties) compelled households to segregate waste properly prior to hauling, and enabled barangays to have functional MRFs as well as composting centers. These achievements would not have been possible through a centralized hauling system.



Decentralization is key to the success of Zero Waste programs. Garbage hauling is done per barangay, with waste workers that are able to establish relationships with households. Photo by Miko Alino

3. Institutionalized organics management systems

When the city, municipality, or barangay provides structures and systems for organics management, such as land for composting, or partnerships with companies for small-scale anaerobic digestion, better at-source segregation for organics is achieved.

At present, while many cities and municipalities implement segregated collection, the destination of biodegradables and non-biodegradables are the same. When the city has no system beyond segregated collection (eg. structures that facilitate organics management, therefore rationalizing and showing the benefits of waste segregation) households and businesses do not see the point in complying.

4. Waste prevention and reduction systems

While cities and municipalities are mandated to implement waste segregation at source, there is also a greater need to enforce waste prevention and reduction. This can be done through ordinances or projects that aim to minimize, for example, plastic waste or food waste.

It is in this respect that cities and municipalities need strong policy and implementation support from the national government.

Plastic bag bans, for example, will be more comprehensively enforced through a national ban because cities do not exist in isolation from its neighbors. Other laws such as extended producer responsibility (EPR), or mandating manufacturing companies to limit single-use plastic packaging, or change delivery systems, need to be formulated and enforced at the national level.

5. Incentivization of compliant barangays, businesses and schools

Cities need to monitor the compliance of barangays, businesses and schools. But beyond monitoring, recognizing the efforts of best-performing establishments fosters pride and increases active participation.

National agencies and local governments alike have organized award-giving events to recognize communities, businesses or groups

that have successfully implemented Zero Waste programs. Awardees are often presented with tokens, additional equipment for waste management, or even prize money (sometimes sourced from waste collection savings).

6. Support for the national ban on incineration

Incineration, including WTE incineration, and its variations (gasification, pyrolysis, and plasma arc, etc) are waste burning methods. Burning waste does not address the problem of waste at root.

Addressing the problem of waste effectively means “turning off the tap”—making sure that less and less volumes of waste are produced. Incinerators rely on large supplies of waste,

encouraging the generation, and not the minimization of waste.

Cities that mistakenly opt for incineration will find that:

1. They still need to deal with the problem of ash and sludge—by-products of the burning process that are classified as toxic waste.

Cities will still need an ash landfill apart from a residuals-only landfill to dispose of this waste, and the landfill will need to be a hazardous waste landfill to prevent environmental contamination. (Please see Annex 2 for more details.)

2. They will need to invest in very costly pollution monitoring systems and law

Singapore Ministry of Environment and Water Resources: incineration “not a sustainable solution”

The problems with incineration can be seen in the case of Singapore whose dependence on waste incineration has not solved their waste problems. Although it is a small city-state, they now need to build a new waste incinerator to operate aside from their old ones, and build a new hazardous waste landfill for the ash. In the website of the Ministry of Environment and Water Resources, they acknowledge that incineration is “not a sustainable solution.”¹⁹

Singapore relies heavily on incineration for waste management. In 1999, they finished building their only remaining landfill, Semakau landfill, as a receptacle for waste as well as the country’s incineration ash. At the time of building, it cost SGD 1.36 billion. The landfill was supposed to be functional for 47 years, until 2046.²⁰ However, the government has acknowledged that because of the country’s growing amount of waste (including incinerator ash) the landfill’s capacity will only last until 2035.²¹

The country already operates five incinerator plants. With the rate of waste generation, the government has estimated that they need to build a new incineration plant “every 5-7 years,” but with waste reduction and recycling, they

hope to build one less frequently, every “8-10 years.”²²

The Singapore government also acknowledges that, while they find incinerators “effective,” it is not a “sustainable solution” because:

- “Incineration plants are very expensive to build and operate. They also take up large areas of land. We cannot keep building more incineration plants indefinitely.”
- “Pollutants, such as NO_x, SO₂, dioxin and particulate matter, are produced in the process of incineration and they affect our air, soil, and water quality.”

They also admit that pollution control systems in incinerators removes only “most of the pollutants”, meaning that pollutants are still left, although they comply with the standards.²³

The Singapore example highlights that incineration does not solve the waste problem. It has abetted waste production in the city-state by covering up the root of the problem: the excessive and increasing generation of waste.

This illustrates how incineration hinders waste prevention and reduction, which is at the heart of Zero Waste approaches.

enforcement mechanisms to ensure incinerators meet emission standards, and still have to manage increased health problems within population.

3. They will need to expand capacity or build more incinerators as the years progress. Incinerators abet waste generation. Studies show that unless the world veers away from business-as-usual, plastic trash will increase by 70% by 2050.¹⁸
4. They will likely face strong public opposition, in the light of worldwide evidence of the problems caused by incinerators.

(Please see Annex 3 for more information on how incineration hinders the implementation of RA 9003.)

Policy options for local and national government leaders

With strong political will and robust policies in place, government leaders can transform their localities into sustainable cities.

However, it is important to note that the work does not end at the local government unit (LGU) level. Many LGUs which are already enacting Zero Waste policies need similarly strong policy support from national government agencies and national legislators.

For example, cities that are trying to reduce non-recyclable plastic waste cannot do this unless there is a law at the national level to mandate businesses to reduce and ultimately stop the use of single-use disposable plastic packaging.

Leaders in national government agencies must realize they also have an important role to play in activating sustainable, Zero Waste Cities by supporting policies that promote sustainability and removing policy support from systems that hinder the success of local governments. Unfortunately, several national government agencies in the Philippines, such as the Department of Environment and Natural Resources (DENR), the Department of Energy (DOE), and the Department of Public Works and Highways (DPWH) are promoting waste incineration—in violation of national laws (RAs 8749 and 9003) that, as government line agencies, they should be promoting.

Local government officials need to ensure that they do not fall into the same trap of believing that constructing waste incinerators will solve their waste problems. They should instead call upon national government agencies to enact and enforce national policies that can help them institute Zero Waste systems and become sustainable cities.



Single-use plastics such as plastic sachets are posing big problems to Philippine cities and communities. A law at the national level mandating businesses to reduce and ultimately stop the use of single-use disposable plastic packaging is needed. Photo by Khate Nolasco

Below are examples of practical Zero Waste policies that local and national government officials can enact.

A. LGU-level policies

1. Regulation on the use of plastic bags and other non-recyclable products

What is it	<p>An ordinance regulating single-use plastic bags and other non-recyclable containers that are provided for packaging or transporting goods.</p> <p>Several cities in the Philippines have different versions of such ordinances, with varying degrees of coverage. Most ordinances focus on shopping bags and styrofoam (expanded polystyrene) containers, but the others have expanded coverage to plastic straws and secondary packaging, etc.</p>
Best practices	<p>It is recommended to develop a timetable for gradual transition and eventual phase-out of plastic bags and other secondary packaging.</p> <p>In cities such as San Fernando, introducing a 6- or 12-month moratorium period,²⁴ helped businesses and residents adjust, thus achieving better compliance rates among constituents.</p> <p>To be effective, a good regulation should also limit the use of so-called biodegradable bags (oxo-degradable)²⁵ or those made out of plant material (bio-plastics).²⁶</p>
Examples	<p>The City of San Fernando has achieved an 85% compliance rate for the ordinance, thanks to its gradual implementation, as well as continuous door-to-door education campaigns.</p> <p>Several cities also initiated enforcement in government buildings (i.e. City Hall), to demonstrate that LGUs can “lead by example.”</p> <p>Other examples include: Muntinlupa,²⁷ San Fernando,²⁸ Quezon City,²⁹ San Carlos,³⁰ Pinabacdao (Samar),³¹ Los Banos,³² Calamba, Binan, Dumaguete,³³ Makati,³⁴ Cagayan de Oro,³⁵ Albay,³⁶ Province of Bulacan,³⁷ Province of Cavite,³⁸ and Imus.³⁹</p>

2. Regulation on the use of plastic straws, cutleries, plates, cups and other single-use items

What is it	<p>An ordinance regulating single-use plastic straws, cutleries, plates, cups and other single-use items, often provided in food establishments and public events.</p> <p>The regulation may be an expansion of an existing ordinance regulating the use of non-recyclable plastics.</p>
Best practices	<p>As in the case of plastic bags, cities may consider adopting a moratorium for implementation, in order to give establishments time to look for alternatives.</p> <p>A comprehensive ban can include different types of single-use containers and cutlery (including paper cups and paper food boxes, which are actually lined with plastic and therefore not recyclable). It is best to roll this out in a phased implementation plan, as in the case of Seattle and the European Union.</p>

	Others have adopted a more flexible approach by offering straws only by request. Nonetheless, it is recommended to develop a timetable for gradual transition and eventual phase-out of identified single-use items and other disposables.
Examples	<p>Cities in the Philippines have yet to approve an ordinance banning the use of plastic straws, but there are several LGUs (e.g. Iloilo⁴⁰) that have made proposals passing such bans.</p> <p>At a regional level, the European Parliament in October 2018, voted to ban single-use plastic items, and in December 2018, an agreement on the rules for the European Union-wide ban. The measures include:</p> <ul style="list-style-type: none"> • bans on several single-use plastic items including plates, cutlery and expanded polystyrene food containers and beverage cups; and • ensuring manufacturers pay for waste management and clean-up of several single-use plastic items, including cigarette butts and fishing gear.⁴¹

3. Incentives for RA 9003-compliant barangays

What is it	<p>Incentives for barangays implementing Zero Waste initiatives.</p> <p>Non-compliant local government units often face cases under RA 9003, resulting in the suspension of sitting officials. This policy seeks to promote best practices by recognizing LGUs that have successfully implemented Zero Waste programs in their respective cities or municipalities.</p>
Best Practices	<p>Incentives can be sourced from savings generated from lower waste collection costs, as well as support from the private sector.</p> <p>Other incentive options include additional training for LGU staff, or equipment for improving sorting and composting activities.</p>
Examples	<p>Quezon City has offered incentives to compliant barangays, giving as much as 50% of budget savings from waste collection cost.</p> <p>Qualified barangays should:</p> <ul style="list-style-type: none"> • achieve a 25% volume reduction of solid waste (which can be achieved through proper segregation at source and management of organics so they can be diverted from landfills); • operate a functional MRF; • be RA 9003 compliant for six months; and • develop and implement a solid waste management plan. <p>In Alaminos, Pangasinan, the city government distributed worms and vermicompost, and offered vermicomposting trainings for free to encourage composting among barangays, residents, schools and other institutions.⁴²</p>

4. Tax breaks and other incentives for RA 9003-compliant businesses and social enterprises that create jobs, and other livelihood opportunities, etc.

What is it	This is a policy that will give positive reinforcement in the form of incentives to businesses that are complying with RA 9003.
Best Practices	Incentives can be sourced from savings generated from lower waste collection costs, as well as support from the private sector.

	Other incentive options include additional training for LGU staff, or equipment for improving sorting and composting activities.
Examples	<p>Example of incentives are tax breaks that may be offered to schools, businesses, institutions and social enterprises that are managing their own waste properly, thereby resulting in savings for the city.</p> <p>Other incentives such as waived payment for business permit renewal, cash awards, public recognition and the like may also be given to businesses and enterprises that support waste reduction, create green jobs, promote conservation of resources, and other similar efforts.</p>

B. National laws

1. City/Municipality Environment and Natural Resources Office (CENRO/MENRO) as permanent units in LGU structures

What is it	<p>At present, cities and municipalities in the Philippines are not required to have a dedicated unit or staff for the City/Municipality Environment and Natural Resources Office.</p> <p>Municipalities that do not have enough operating budget often have to assign other staff to double up on this duty. Without a dedicated unit or staff, implementation of environment-related policies, including for waste, can fall through the cracks.</p> <p>There have been efforts from the DENR to amend the Local Government Code of 1991 to create CENRO/MENRO as a permanent position or unit in cities and municipalities.</p> <p>The amendment ensures that such officers/offices do not have overlapping responsibilities (i.e. administrative operations, agriculture, public safety, etc.) and their status not dependent on elected government officials.</p> <p>However, this amendment is yet to be approved.</p>
Best Practices	<p>The presence of CENROS/MENROs in LGUs has provided focus and additional resources in addressing environmental issues in the city, particularly waste management.</p> <p>All RA 9003 model LGUs have dedicated CENRO or MENRO and staff that implement Zero Waste programs.</p>

2. Ban on plastic scrap imports

What is it	<p>A national ban on imports of plastic scrap, similar to China's plastic waste ban, to stop the flow of all plastic scrap waste imports into the country.</p> <p>Under the guise of recycling, developed countries have shipped plastic scrap out of their countries into poorer countries that are already struggling with their own plastic scrap. Until December 2017, China was the main destination for this plastic scrap.</p> <p>In January 2018, China closed its doors to plastic waste imports, prompting</p>
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waste exporters from Europe, US, etc., to send the waste to countries in Southeast Asia, such as Vietnam, Malaysia, Thailand and Indonesia.⁴³

The Philippines has also been a target of plastic scrap shipments, for example, the shipment of plastic scrap from Korea which was sent to Misamis Oriental last July 2018.⁴⁴

With moves from neighboring Southeast Asian countries to ban plastic waste imports, the Philippines can be targeted by waste traders are on the lookout for other countries with no bans in place.

This national ban should therefore be an urgent priority by Philippine lawmakers.

Best Practices

Although trade in waste from developed to developing countries is banned under the international treaty, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal,⁴⁵ the treaty does not cover waste that is labeled for “recycling.”

Many waste traders take advantage of this loophole. Plastic waste and scrap are being shipped to poor countries because they are purportedly for recycling.

China banned plastic scrap imports because the quality of much of the scrap being shipped to them was not fit for recycling.

To make this ban effective, countries such as the Philippines (which is already a Party to the Basel Convention) should further ratify the Basel Ban Amendment, to plug the loophole of permitted waste trade under the guise of recycling.

Examples

Malaysia issued a permanent ban on the import of plastic last October 2018, after the country became a recipient of the plastic waste destined for China. Included in the directive was the ban on the import on other types of plastic, to be effective in three years.⁴⁶

In July 2018, Vietnam also issued a directive to control plastic scrap imports. Import permits for plastic waste are now only given to companies which can prove they can process the volume of waste they import, and that the waste imported meets environmental standards.⁴⁷

Thailand is also set to ban the importation of all kinds of plastic scrap by 2021.⁴⁸



The Philippines has been a target of plastic scrap shipments from countries like South Korea and Canada. A national ban on waste importation should be made an urgent priority. Photos courtesy of EcoWaste Coalition

3. Mandatory organics recovery

<p>What is it</p>	<p>Organic waste comprises more than half of the total waste volume generated by most cities and municipalities in the country.</p> <p>Majority of local governments, however, report a low diversion rate in organic waste, citing the lack of composting facilities.</p> <p>Creating a policy that will require mandatory organics recovery will result in:</p> <ul style="list-style-type: none"> • less waste sent to landfills, extending the life of the landfill; • no organic waste in landfills (lessening methane buildup); • less need for hauling; and • increased savings for the city (reduced costs for tipping fees and hauling services). <p>This policy will also complement and strengthen the segregation-at-source.</p>
<p>Best Practices</p>	<p>The DENR and, in agricultural areas, the Department of Agriculture (DA) can start with developing an inventory of compost markets and demands, thus providing information for building future capacity for managing organic waste.</p>
<p>Examples</p>	<p>Under RA 9003, LGUs are mandated to achieve at least 50% diversion rate, but there are no specific targets for recoverable materials (such as organic waste, recyclables).</p> <p>The state of California, USA, has enacted a law⁴⁹ requiring businesses to manage their own organic waste.</p> <p>In India, the government has required bulk generators (businesses or residential buildings) to manage their own organic waste⁵⁰ by either setting up their own composting/biogas facility or contracting a third-party service provider.</p>

4. Food waste reduction and redistribution

<p>What is it</p>	<p>Food or organic waste account for more than half of the waste generated by households.</p> <p>While RA 9003 mandates composting activities, there are gaps in promoting other diversion options, for example, raw vegetables that only have small spoiled parts or are only partially wilted can be cut and then further used, instead of being outrightly disposed. Vegetable scraps can also be used to feed livestock before setting aside the remains for composting.</p>
<p>Best Practices</p>	<p>Partnerships with the private sector: supermarkets, hotels, restaurants, and connecting them with charity organizations can ensure supply and demand channels.</p>
<p>Examples</p>	<p>Several social enterprises and NGOs have ventured into food banking. Good Food Grocer (GFG)⁵¹ was recently opened by Rise Against Hunger Philippines.</p> <p>Overseas, the Food Bank For New York City⁵² has been operating in New York's five boroughs for 35 years.</p> <p>Senate Bill No. 357 (Zero Food Waste Act),⁵³ proposes a National Anti-Food Waste Scheme that will serve as a coordinating agency between food businesses, such as food manufacturers, supermarkets, restaurants, cafeterias, and hotels, and food banks.</p>

ANNEX 1

Implementing Zero Waste: Challenging But Doable

By Sherma E. Benosa

As the world scrambles to solve the plastic waste crisis, two Asian cities stand tall for having made huge strides not only in waste management but also in waste reduction.

Trivandrum City in Kerala, India, and the City of San Fernando in Pampanga, Philippines, are hailed as Zero Waste model communities with their successful implementation of Zero Waste programs: compliance rate is high, so is their diversion rate from landfill.

But not too long ago, these cities were on the brink of a waste crisis. Landfills and dumpsites were filling up in their communities. Trash littered streets and clogged waterways. The problem was so huge that incineration was even considered as an option.

But instead of taking a disastrous step toward building waste incineration facilities, leaders of these model cities turned to more sustainable solutions. They partnered with non-government organizations (NGOs) which guided them in implementing Zero Waste programs.

Today, these cities are proof that indeed, Zero Waste is not only possible; it is the way.

Changing people's mindsets
With systems and policies already in place, implementing Zero Waste in both cities now seem less challenging. But leaders of these cities say that the road to get to that point was an uphill climb.

"We met numerous challenges, especially at the start," shared Dr. K. Vasuki, Director of Suchitwa Mission, an organization of the Government of Kerala responsible for evolving implementation strategy and

providing technical inputs for sanitation and waste management projects.

"When I was new in the mission, there was no clear [waste management] strategy. There were few learning models but no clear strategy. The idea at the time was to move toward incineration. People did not have faith in the government. For the first six months, we did not even have a complete idea on how to go about it," she said.

To understand the problem, they partnered with Thanal, a public interest research, advocacy, and education organization based in Trivandrum with focus on environmental health and justice.

"We felt it was crucial to showcase models to demonstrate that Zero Waste works. But the mission only has an advisory role. We do not implement projects," Dr. Vasuki shared. "We invited people to implement, but there were no takers to the idea. There was no place to demonstrate."

According to Dr. Vasuki, it was a big challenge to convince people that doing away without disposables is doable. "People were resistant and critical about it. They thought it was impossible, impractical, and just not doable. So, we had to demonstrate that it was possible," she said.

They partnered with the organizers of the 2015 National Games to implement a program they called Green Protocol. The aim was to reduce waste generation by, among others, banning the use of disposables in all sporting venues. They encouraged the use of reusable

tableware and tumblers. With the help of 700 volunteers, the initiative prevented the generation of 120 metric tonnes of disposable waste.

With the successful implementation of Green Protocol at the event, people started believing that perhaps doing away with disposables was possible, but they were still not convinced it could be replicated.

This, according to Vasuki, challenged them to up their game. They built more models and strengthened their education campaign. They invited various segments of the society to take part in the initiative.

“We left no stone unturned. We approached every possible segment of the society—the schools, the church, the businesses... We convinced people that waste is everybody’s responsibility. We started the campaign, “My Waste, My Responsibility.”

Under the campaign, households were to manage their organic waste. “In Kerala, our biodegradable waste is 40 to 60 percent; because it is now managed at home, we are not at all concerned with this waste stream. Biodegradable waste is not a threat; it is a resource and is easy to compost at home. If we manage biodegradable waste, we have addressed a big part of the problem,” she shared.

Today, the Green Protocol has become embedded in people’s lifestyles, penetrating a great fraction of society.

Strict law enforcement

The Philippines, meanwhile, has a national law called the Ecological Solid Waste Management Act which decentralizes waste management down to the smallest unit of government: the barangay (village). The law requires at-source waste segregation, daily door-to-door segregated waste collection, and building of materials recovery facilities (MRF) for composting of organics and temporary storage of other waste.

While the national law is good on paper, many cities, including San Fernando back then, have a hard time complying with the law.

“There was resistance among heads of the barangays in implementing the law,” shared Benedict Jasper Lagman, City Councilor of San Fernando. “They feared that if they would strictly implement it, they would turn away the voters.”

But Mother Earth Foundation (MEF), a Philippine-based NGO helping local government units in implementing Zero Waste, was able to successfully convince then-mayor Oscar Rodriguez that Zero Waste was the way to go.

“So we implemented it,” Lagman said, adding that they were met with resistance when they started requiring households to segregate their waste.

Assisted by MEF and armed with MEF’s 10 Steps to Implementing Zero Waste Program in the Community, the city persevered. They conducted baselining, multi-stakeholder consultation, intensive house-to-house information and education campaigns, dry-run and eventually full implementation of daily door-to-door segregated waste collection. The city also gave grants to barangays to construct MRFs, and provided every barangay four tri-bikes to be used for waste collection.

Soon, people not only became used to segregating their waste but also started embracing the program, having seen its benefits: reduced waste, resulting in huge savings from hauling and transport and tipping fees and jobs generated for waste workers.

“Instead of losing votes, elected officials who promoted the program actually had more votes the next election,” Lagman said. Among them was Lagman himself. Then a neophyte politician, Lagman was at the

bottom of the winning councilors on his first term. When he sought re-election, he was at the top.

Following the successful implementation of their waste management program in San Fernando, Lagman authored an ordinance banning the production, distribution and use of single-use plastic bags in the city, a measure that pitted him against local businesses who thought that the ordinance would be detrimental to their business.

“Nine thousand businesses including multinationals were to be affected by the ordinance, so we engaged them,” Lagman said.

Eventually, a compromise was arrived at. “We agreed to stagger the implementation. We did baby steps. We educated people on radio and TV. We started with Plastic-free Friday. Then, for the first three months, we banned the use of polystyrene as packaging of food product. Finally, in 2015, we totally banned the use of plastic bags. Now, 85% of the citizen are obeying the rules,” he said.

Like Dr. Vasuki, Lagman underscored the importance of political will and collaboration in implementing a crucial program like Zero Waste.

“There is no perfect law, but through the strong partnership of the government, NGOs, and the private sectors and the strong participation of the community, we were able to balance the economic progress and environmental sustainability for the benefit of the generations to come,” he said. “When the people see the importance of the program, they follow,” he added.

Dr. Vasuki agreed. “Changing people’s behavior is a slow process. We have to accept that. We have to be persistent. But what I learned is that, when we showcase models and make people understand the benefits of the program, they support it. People do change,” she said.

Sherma E. Benosa is the Communications Officer of GAIA Asia Pacific. This article appears on the first issue of Waste Not Asia, the official publication of GAIA Asia Pacific. (Waste Not Asia, Vol. 1, Issue 1, January to March 2018. pp. 11-14).

ANNEX 2

Can Philippine cities deal with incinerator ash?

Incinerator ash, considered as hazardous waste in many countries, needs special handling, first because of its toxic content, and second because of its form. If not properly contained, toxic ash is easily dispersed by winds and, because of its powder-like form, are impossible to recover once dispersed.

The most toxic and hardest to handle is fly ash (miniscule solid particles captured from the air emissions of an incinerator chimney, since it contains the concentrated hazardous chemicals.

Any claim by incinerator companies that their ash is “safe” is untrue.

In fact, many industries, including incinerator industries and the hazardous waste companies they hire to treat incinerator ash, acknowledge the high toxicity of ash from the incinerator process.⁵⁴

It is also not true that incinerator ash can be used as materials for construction or in the manufacture of cement and roads.

Unlike fly ash from coal plants, fly ash from waste incinerators have high chloride content, which negatively affects the properties of the cement.⁵⁵

Fly ash in Europe, Japan, Sweden and China In Europe, where incinerator emissions

standards are fairly strict, incinerator fly-ash is landfilled, or disposed of and contained in abandoned salt mines in Germany.⁵⁶ (Note that containment in salt mines is also one of the methods to dispose nuclear waste.)

Other methods use vitrification, that is, the ash is exposed to very high temperatures in order to stabilize it into a glass-like substance before disposal. This method, once required in Japan, is very expensive and energy intensive since very high temperatures need to be produced.⁵⁷

In Sweden, fly ash needs to be stabilized before disposal in landfills. Incinerator ash is sent to 'washing plants' where the toxic content is 'washed out' from the ash, and then contained; or to plants that specialize in fly ash stabilization.⁵⁸ Currently, Sweden sends its fly ash to a facility in Norway, where the incinerator ash is treated before it is contained by mixing it with concrete, and then pours it into an unused limestone quarry.⁵⁹

In China, the government requires incinerator fly ash to be stabilized, pre-treated and solidified with cement before disposal in a special landfill. However very few cities in China have the proper systems to deal with fly ash. Enforcement of regulations on fly ash disposal is also lacking. Hazardous fly ash is frequently deposited in open dumps without any treatment.⁶⁰

At three Chinese WTE incinerator facilities funded by the Asian Development Bank (ADB), civil society groups in China found fly ash to be stored in areas lacking protection from rainwater, and was disposed of openly in municipal waste landfills in powder (non-stabilized) form.⁶¹

Many incinerator companies that approach Philippine cities are quiet when it comes to the disposal of incinerator ash.

Even sample public-private partnership

contracts for incinerator facilities, for example, the one commissioned by Asian Development Bank (ADB) for Quezon City, glosses over incinerator ash.

The terms sheet⁶² of the pre-feasibility study just identifies the need for a landfill for the incinerator ash, and under the terms, leaves it up to the city government to ensure that such a facility exists and can be used for hazardous ash waste:

"QC shall ensure QC landfills accept all such fly ash and un-incinerable waste....If QC landfills are unable to accept fly-ash and un-incinerable waste, QC to reimburse Concessionaire for costs incurred in disposing same to other landfills."

The production of incinerator ash shows how waste incinerators can never be part of a sustainable Zero Waste system.

Aside from its significant toxicity, treatment, stabilization and disposal of the ash present huge costs for cities, aside from the expensive facility itself.

ANNEX 3

WTE incineration: hindering RA 9003, creating a debt-trap, blocking sustainability

While the Zero Waste approach translates to cost savings for the city, facilitates the implementation of RA 9003, and enables sustainable cities, incineration systems—including so-called WTE incineration—takes cities and municipalities to the opposite direction.

Experiences of cities have shown that pursuing these 'quick-fix,' 'too-good-to-be-true' waste burning facilities, is not only prohibitively expensive, but also prevents cities and municipalities from complying with RA 9003.

For example, many incinerator companies

approaching local government officials today are marketing WTE incinerators by claiming no waste segregation is needed.

Local government units need to be smart when they are approached by companies with this claim.

The burning of mixed (unsegregated) waste is known to create the most harmful pollutants. And since waste in the Philippines is more than 50% organics or wet waste, the facility will actually use large amounts of energy to burn the waste, using more energy to operate than it can theoretically create.

In China, for example, where wet waste composition is similar, incinerators need to burn coal aside from the waste.⁶³

Aside from being the most expensive method for waste treatment, incinerators are also the most expensive way to generate electricity.

The projected capital cost of new waste incinerator facilities is twice the cost of coal-fired power plants and 60% more than the cost of nuclear energy facilities on a per installed kilowatt basis.⁶⁴ WTE incinerator operations and maintenance costs are also 10 times the cost of that for coal plants and four times the cost for nuclear plants.⁶⁵

Instead of creating savings, these facilities pose huge financial burdens on cities and municipalities who are locked into 25- to 30-year 'put-or-pay' contracts with private companies. Put-or-pay contracts stipulate the minimum amount of waste a city is committed to send to the incinerator per day; if the city produces or delivers less waste, it will be penalized.

This negatively impacts a city's efforts for recycling and composting. To avoid penalties, many cities in other countries have tried to maximize the use of incinerators by including recyclables as well as compostable organic waste, for burning.

Case study: Cost analysis on a proposed incinerator in Quezon City

In 2016, the Asian Development Bank embarked on a Pre-feasibility Study on Conventional Waste-to-Energy Project for Quezon City (QC).⁶⁶ The study outlines the cost and viability of a WTE incinerator in QC, as well as the ideal contract arrangements.

QC is already one of the top local government spenders on waste management. The city currently pays PHP 600 per ton of waste in tipping fees. However, the ADB study found that a PHP 13.1 billion facility, processing 1,000 tons per day is viable for the city.

Under a long-term (25 years) put-or-pay contract with the developer, the city would be required to allot a tipping fee of as much as PHP 3,700 per ton (equivalent to more than PHP 1.3 billion a year)—and representing a 500% increase from the current costs.

In contrast, investment in actions higher up the waste hierarchy (reduction, reuse and recycling, alongside better waste segregation), have already translated into tangible savings for QC.

The city already lowered its expenses for waste management from PHP 1.014 billion in 2014 to PHP 768.3 million in 2015 through grassroots approaches, segregation programs, the establishment of materials recovery facilities, solid waste management summits for village heads, a recyclable trading program, and an ordinance on plastic bag reduction.⁶⁷

The proposal about the viability of a WTE incinerator in QC therefore raises fundamental questions applicable to any other city or municipality. Waste incineration, including WTE incineration, is costly, creates a debt-trap for cities and hinders sustainability, aside from putting citizen health at risk. Why should cities and municipalities consider waste burning, when there are better, safer, more cost-effective, and proven options?

- ¹ <https://www.un.org/sustainabledevelopment/cities/>
- ² US EPA, Climate Change and Waste <https://archive.epa.gov/epa/climatechange/climate-change-and-waste.html>; Volume 44.3 'Zero Waste Circular Economy - A Systemic Game-Changer to Climate Change' https://www.boell.de/sites/default/files/radical_realism_for_climate_justice_volume_44_3.pdf; and Zero Waste: A Practical and Effective Approach to Reducing Human Impacts on Climate https://www.esrl.noaa.gov/news/quarterly/summer2009/ZeroWaste_poster.pdf
- ³ C40 is a network of the world's megacities committed to addressing climate change. C40 supports cities to collaborate effectively, share knowledge and drive meaningful, measurable and sustainable action on climate change. <https://www.c40.org/about>
- ⁴ <https://www.c40.org/other/zero-waste-declaration>
- ⁵ <http://www.no-burn.org/ngos-working-with-cities-in-asia-pledge-to-work-on-zero-waste-prevent-nearly-1m-tons-of-waste-from-entering-the-environment/>
- ⁶ <https://www.un.org/sustainabledevelopment/cities/>
- ⁷ <https://emb.gov.ph/wp-content/uploads/2015/09/RA-9003.pdf>
- ⁸ The Stockholm Convention on Persistent Organic Pollutants is a global treaty ratified by the Philippine Congress in 2004. It went into force in May 2004
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- ¹⁴ CSFP CENRO, 2018 (interview with Regina Rodriguez)
- ¹⁵ <https://www.rappler.com/science-nature/52839-garbage-law-san-fernando>
- ¹⁶ Tacloban City pays PHP 1,100 per ton for tipping fee.
- ¹⁷ Penalties for households and establishments that do not segregate their waste is not a new concept; in fact, the consistent enforcement of segregation policies is what makes waste segregation in other countries such as Germany, Sweden and Japan successful.
- ¹⁸ Kaza, S., Yao, L., Bhada-Tata, P., & Van Woerden, F. (2018). "What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050." Urban Development Series. Washington, DC: World Bank.
- ¹⁹ <http://www.mewr.gov.sg/topic/incineration>
- ²⁰ http://eresources.nlb.gov.sg/infopedia/articles/SIP_1008_2010-03-22.html
- ²¹ <https://www.mewr.gov.sg/topic/landfill>
- ²² <https://www.mewr.gov.sg/topic/incineration>
- ²³ *ibid.*
- ²⁴ <https://www.facebook.com/CityOfSanFernando/photos/a.276317464565/10152637372219566/?type=3&theater>
- ²⁵ Ellen MacArthur Foundation's New Plastics Economy, along with 150 major organizations around the globe called for a ban on this material as they "do not safely biodegrade but fragment into small pieces, contributing to microplastics pollution."
- ²⁶ Bio-plastics also do not biodegrade easily and only breakdown in certain conditions.
- ²⁷ <http://www.muntinlupacity.gov.ph/wp-content/uploads/2017/07/blg-10-109.pdf>
- ²⁸ <https://www.facebook.com/CityOfSanFernando/photos/a.276317464565/10152637372219566/?type=3&permPage=1>
- ²⁹ <https://docs.google.com/file/d/0BxVtyjOrPdYyZkQ3OHBXU3k2ZUE/edit>
- ³⁰ https://carbonn.org/uploads/tx_carbonndata/Ord_14-53-Plastic_Ordinance.pdf
- ³¹ <http://www.pna.gov.ph/articles/1058968>
- ³² Municipal Ordinance 2008-752, <https://webcache.googleusercontent.com/search?q=cache:-B-KRzO0gEsJ:https://lbtimes.ph/2016/03/02/a-plastic-story/+&cd=2&hl=en&ct=clnk&gl=ph&client=firefox-b-ab>
- ³³ The city ban is discontinued due to lack of enforcers, currently limited in the public market. <https://pia.gov.ph/news/articles/1008844>
- ³⁴ <http://www.makati.gov.ph/portal/news/view.jsp?id=2895>
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- ⁴¹ http://europa.eu/rapid/press-release_IP-18-6867_en.htm
- ⁴² <http://www.no-burn.org/wp-content/uploads/ZW-Alaminos.pdf> and http://www.alaminocity.gov.ph/public-service/local-policies/Legislative_Issuances/CityOrdinances_-_ENACTED/2014Ordinances/AlaminosCityOrdinance2014-16.pdf
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- ⁴⁴ <https://www.ft.com/content/bffeace8-e892-11e8-8a85-04b8afea6ea3>
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City and municipal officials in the Philippines are faced with the golden opportunity to transform their localities into Zero Waste Cities—and in the process help them establish resilient and sustainable cities, help fulfill Sustainable Development Goal 11, comply with the Ecological Solid Waste Management Act or Republic Act 9003, and transition to a sustainable circular economy.

This guide lays out recommendations for policies that will help city planners put Zero Waste in action and implement RA 9003, while demonstrating that Zero Waste is both practical and achievable.

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