Feedback on Metro Vancouver's Waste Management -Discussion paper to support *Climate 2050* and the *Clean Air Plan*

1. We applaud the goal of moving to a circular economy and hope that it is one based on prioritizing ecological health and equity as well as other key Zero Waste principles. As the region starts considering the circular economy, the thinking broadens from "what do we do with this wasted material?" to "how do we design systems to prevent materials and products from being wasted?" and "what can meet this need in a waste-free model?" The solutions then end up being much broader than handling material as solid waste (often engineering solutions) to ones about policy, behaviour change and system change.

2. We applaud the notes on page 3 and elsewhere about embodied emissions. Accounting systems for carbon continue to evolve. Present accounting does not include the consumption-based emissions and allows us to feel as though our consumption choices do not impact the climate. This is not the reality and Metro Vancouver should be both pushing to have the accounting systems changed as well as acting as if these changes have already occurred and include targets and actions to help reduce these consumption-based emissions. Ideally graphics like Figure 2 would also have a companion figure that shows the actual emissions estimates when consumption based emissions are included. Otherwise the discussion is disproportionately focused on buildings and transport and fundamentally misses a driver for a lot of them: consumption. The emission sources noted on page 7 could then talk about economy-based emissions with subsequent strategies to target wasteful and inefficient consumption.

3. Climate Change Targets: It is appropriate that Metro Vancouver's targets are in line with the IPCC's recommendations and not some of the weaker ones used by other jurisdictions. One could argue that Canadians have the opportunity and capacity to do more (as well as perhaps the responsibility due to our higher past emissions) and so if these can be accelerated or exceeded, they should be.

4. Air Quality Targets: It is good to acknowledge that there are no known safe levels for many air contaminants and have targets to at least meet the standards. However, these standards do not focus on emissions but only the ambient and visual air quality of Metro Vancouver. Metro Vancouver is lucky to avoid much of the worst pollution through the nature of its airshed, where some of the emissions may be blown further afield such as into the Fraser Valley. "Dilution is not the solution to pollution" is an apt phrase here. As such, a far stronger set of targets including ones that set targets for emissions (and perhaps include some measures of air quality in the Fraser Valley) are needed. It would also be appropriate for Metro Vancouver to pursue emissions reductions for its corporate sources of emissions (such as closing the Burnaby Incinerator or at the very least, putting in the required pollution control measures, such as for sulphur oxides, to meet the provincial timelines). It is inappropriate to frame the output of such facilities as only contributing x% to any one kind of pollutant release regionally instead of trying to minimize each source, especially when it is acknowledged that there are no safe levels for many pollutants and that they cause a large number of deaths each year (not to mention ongoing health problems and impacts on the environment).

5. Linkages to other issue areas
   Energy – it is important to avoid wasting energy but it is also important to take a systems-thinking lens to this. Capturing waste heat from liquid waste is a good way to recover this energy and actually reduces GHGs. Burning solid waste actually produces more GHGs than landfilling (which is a form of carbon storage for some materials like plastics) and encourages the ongoing production of waste. Even the capture of landfill gas (which should be done) must be planned for in such a

way that the first priority is in preventing the formation of gas in the first place by having an increasingly robust organic waste prevention system ensuring that the capture and use of the gas does not drive continued waste production.

Industry – businesses using feedstocks from another is a suitable purpose but only when the feedstocks are to be used as *materials* and not for energy. Destruction of materials through use for energy only wastes the embodied energy and creates further demand for raw material extraction of those materials instead of having incentives for the business that is producing them to decrease their waste in the first place.

6. Emission sources – while the analysis of emissions from hauling recycling and solid waste (and we are assuming organics) will be included in the Transportation Discussion Paper, a systems perspective should note that reducing all of these forms of material outputs through aggressive pursuit of Zero Waste will have GHG reduction benefits for both solid waste facilities and transportation (as well as the upstream benefits from reduced material throughput). A concern is that by separating these two emission sources, the proposed actions tend to be end-of-pipe solutions like capturing gases and changing fuels rather than actual waste reduction.
We are pleased to see a recognition of the value of waste prevention and diversion in this section but a focus on recovering more energy from solid waste will only divert resources from the more important and impactful work on Zero Waste.

7. Current Actions – Solid Waste Management
Disposal ban programs -these are to be commended but can be strengthened by increasing the percentage of loads inspected at all disposal facilities including the Burnaby incinerator, developing a program to inspect material hidden in black bags, working with regional and provincial governments to standardize disposal bans across BC, and preventing waste haulers from circumventing the regional bans by shipping uninspected loads out of region and out of province.

Behaviour change campaigns -again these are great programs that are to be commended but much more can be done. Some of these are wonderful marketing campaigns but it is unclear if the effectiveness at changing behaviour is being tested and the campaigns modified based on the results. Info provided to the Zero Waste Committee tends to focus on views, shares, reach, etc. (marketing metrics) but smaller, more targeted pilot campaigns could be used to see if they actually have the desired result.

We feel that there should be more work done to change behaviours that can reduce waste (such as working with the ICI sector on reduction and diversion) or developing sustainable purchasing standards, templates and data to share. We greatly appreciate that Metro Vancouver shares these campaigns to be used by other local governments.

Extended Producer Responsibility Programs -Metro Vancouver continues to be a leader in pushing for more programs and this work should continue. An added focus must be made to address systemic issues within the BC EPR model:

- to incent innovation;
- to prioritize the top rungs of the Zero Waste Hierarchy (rethink/redesign, reduction, reuse, refill, repair);
- to be more inclusive for entrepreneurs and businesses who want to be part of the EPR program by increasing and standardizing access and opportunities to become collectors, transporters, or processors;
- to ensure fair treatment of service providers;
- to improve transparency;
- enact more inclusive governance models;
- to increase collection and recycling rates; and

- to pay for the full environmental, health and social costs of the product throughout its life cycle, including materials going to incineration, landfill and litter or illegal dumping.

National Zero Waste Council – again a great initiative but it could better live up to its potential by developing clear policy asks that align with international Zero Waste Policies such as adhering to the Zero Waste Definition, and the Zero Waste Hierarchy, templates for local governments and being a stronger advocate for change. Care needs to be taken to ensure that a focus on this does not detract from actual on the ground local campaigns to reduce waste.

Food Recovery Programs – a great suite of initiatives. Using the Zero Waste Hierarchy could help ensure that policy does not foster ongoing wasting of food by suppliers by cementing in the throughput of food that is wasted. A focus on equity should look to solutions that ensure all people have access to quality food with dignity and do not require the existence of food banks in the long term.

National Industrial Symbiosis Program – another good initiative but care must be taken to ensure the inclusion of using waste as an energy source does not create just another way of losing material resources and preventing better solutions from being enacted.

Demolition recycling requirement – an initiative with good intentions but implementation has sometimes allowed loopholes that thwart the desired outcomes. These loopholes need to be closed with a focus on deconstruction to maximize material recovery, and to expand them to other municipalities.

Sharing platforms – these are valued systems that could be expanded to other goods.

Carbon Price Policy – this is a smart initiative and the price used needs to look at future carbon pricing.

Consumption-based emissions inventories – these should be pursued and inform the climate action plan.

Water treatment and solid waste residual – the ash from the incinerator should not be going to cement kilns. Other jurisdictions have had problems with contaminant levels in the concrete requiring pathways to be dug up (despite assurances that all was well to begin with). It may be very hard to prove safety and harder still to recapture all the contaminated concrete that could be dispersed across the region. The precautionary principle would dictate that the ash is handled in a way that minimizes potential for leakage or exposure (as it was before).

Landfill biogas capture and utilization – as noted before, the capture and use of existing gas is recommended however the system must focus on prevention and not come to rely on this for revenue nor fuel.

Landfill Gas Management Regulation – the regional district should follow provincial law.

Biofuel facilities – those that focus on source separated organics that are scaled to the ongoing production levels (after food waste is reduced) and that treat the final output to make usable compost are to be commended.

Emissions controls – as noted, Metro Vancouver has applied to delay adding pollution control measures for sulphur oxides which is counter to being a climate and air pollution leader.

Organic waste management facilities – odour should be controlled but it is unclear why Metro Vancouver pursued building new waste incineration capacity but does not look at building and controlling its own organics facilities that will be needed for the foreseeable future.

Metro Vancouver Odour Management Framework – suitable

Authorization of emissions and **Options to reduce smoke emissions from open-air burning of vegetative debris** -this not only reduces emissions but also can ensure that materials are not wasted and could provide feedstock for organics facilities.

Liquid Waste Management – while our focus is not on liquid waste, some items do cross over.

Biosolids use – actions should focus on keeping these materials as uncontaminated as possible. One way is through encouraging use of the existing EPR programs for oil, pharmaceuticals and residuals as well as new programs for products not yet regulated. Other ways may be working to reduce other materials that may come from business or industry and end up in the liquid waste system when they might be best handled through solid or hazardous waste systems. Keeping the biosolids stream separate from food and yard waste is key to having the highest and best use possible for the latter materials.

8. Emissions Reductions Opportunity – in solid waste the biggest opportunity is through pursuing Zero Waste initiatives which has been mentioned above.

   In terms of solid waste *disposal*, the biggest opportunity is to shut down the Burnaby Incinerator. In 2017, it was the 25th largest industrial GHG emitter in BC, exceeded only by pulp mills, smelters, cement kilns and fossil fuel facilities.[1] It is "the largest source of sulphur oxides from waste management"[2] yet despite this Metro Vancouver has applied to the Province of BC to delay adding pollution control measures to reduce this output. An analysis of the data provided in the Metro Vancouver 2019 Biennial Report -ISWRMP (January 2020) as well as reports to the Zero Waste Committee and financial plans showed that in 2018, emissions of GHGs (in tCO2e/t waste) were 0.46 for the Burnaby Incinerator and 0.20 for the Vancouver Landfill (and 0.083 for the contingency landfills). This shows that using existing landfill capacity is actually best for the climate. The discussion above does not even factor in the air quality aspects and pollution released from the Incinerator for which total annual emissions data is not known as emissions during start-up, shut down and malfunction are excluded from testing and reporting.

   The energy flared but not sold from Metro Vancouver landfills is bigger than the net energy output of the Incinerator. While the amount of energy needed to be put into the Burnaby incinerator was 23% higher in 2018 than in 2010, the amount of energy from the Incinerator used by customers has declined by 49% in the same time period. This highlights the need for stable customers but also explains the drive to have district heating in an adjacent neighbourhood. Zero Waste BC has environmental and health concerns about situating residences close to waste incinerators as well as having the residences come to rely on ongoing waste burning for energy. The amount of energy coming from landfill gas capture of Metro Vancouver facilities is five times that of the net energy coming from the Incinerator. If Metro Vancouver is looking for energy sources, landfills are again preferred over the Incinerator (though again Zero Waste is preferable to both).

   The costs per tonne of waste handled by the Burnaby Incinerator was $87.05 in 2018. This has risen 28% since 2010. When energy sales are included, the costs per tonne are $58.16. The costs per tonne of waste going to landfill is $41.07. This has risen by 24% since 2010. From the data available, it is unclear what the revenues are for energy and thus the net costs. The above are just for the operating costs. Capital costs outlined in budgets from 2010-2018 show that waste to energy projects accounted for $168 million and landfill projects were $54 million.[3] Waste to energy had over three times the capital costs of landfills despite taking only 18% of the waste. The capital costs noted do not include the $2.5 million wasted pursuing new burning capacity.

   The capital costs do not include future pollution control needs for the Incinerator such as the provincial requirement for reduction in sulphur dioxide and hydrogen chloride emissions which Metro Vancouver has requested to delay. Even when energy sales are factored in for burning waste, it is still more expensive than landfilling on an operating cost basis. This is even more true once capital costs are included. This will likely worsen going forward.

   In the ten years since the last Solid Waste Management Plan, only $18 million has been spent on Zero Waste implementation while $463 million was spent on disposal. Given that Zero Waste

[1] Province of BC. BC 2017 Industrial Facility GHG report accessed at https://www2.gov.bc.ca/gov/content/environment/climate-change/data/industrial-facility-ghg

[2] Metro Vancouver (2020). *Waste Management -Discussion paper to support Climate 2050 and the Clean Air Plan.* Page 8.

[3] Projects for landfilling fly ash were assigned to the incinerator. The alternative fuel project was not assigned to either category. This calculation used budget numbers not actuals which were hard to find.

actions have ongoing benefits in terms of preventing waste, that despite this low amount being spent the programs have been effective in decreasing waste and that the last waste plan was meant to focus on Zero Waste, money currently spent on wasting should be diverted to focus on waste prevention. It is the most cost effective solution.

Unfortunately, Metro Vancouver's use of waste incineration has delayed progress on Zero Waste by diverting funds to disposal, has cost the region much more than Zero Waste or even landfilling, has emitted air pollution and has created more GHGs emissions than Zero Waste or even landfills. The climate action plan and upcoming update to the ISWRMP provide opportunities to rectify this.

9. Long Term Goals – Solid Waste -We agree that the solid waste system should be carbon neutral. In the goals as currently proposed, it is not clear at what level an impact is a problem, who defines it and who might experience it. We think air contaminant emissions from solid waste management should be **minimized** as science tells us that there are likely to be impacts but we are unlikely to know all of them or enough about them to manage it appropriately. We recommend "Businesses, governments and residents follow *Zero Waste* models, policies and lifestyles, which significantly reduce consumption-related emissions." This change is recommended as Zero Waste is more encompassing and suited to a broader range of audiences than "circular economy business models" and has an internationally accepted definition whereas circular economy has been defined in different ways and is more specific to how a business functions.

10. Waste Management Emission Targets – there should be clear targets for solid waste emissions but they need to be based on actual emissions so it is unclear if the Portland or False Creek ones are achievable. One that we would support would be: By 2030, eliminate organic material sent to landfill. We also strongly recommend: By 2025, the region has closed the Burnaby Incinerator and does not send waste nor materials to cement kilns or other waste burning facilities. Additional targets should be developed in the ISWRMP update process for the total amount of waste disposed (both total and per capita), recycling, composting, food waste reduction, reuse and consumption or material throughput.

11. Actions: We support the actions noted with the following caveats:
Construction procurement – consider embodied emissions but do not give credit for use of bottom ash in cement as this counters Zero Waste initiatives.

    Using organic waste as animal feed – only once food waste reduction and sharing food with people have been pursued first. Care must be taken not to feed animals waste from their own kind.

    Local biosolids use and Co-digestion – as biosolids will continue to have pharmaceutical and possibly other chemical contamination for some time, clean organics should not be mixed with biosolids. There should be a premium for the clean organics versus the biosolids so ensure that the capacity for highest and best use is preserved. Procurement should work for both kinds but prioritize the use of clean compost for food production while biosolids may be used for other areas.

12. Big Ideas:
Big Idea 1 – instead of prioritizing climate change, where the solutions may then cause further harms in other areas (note that we are facing both climate and ecological crises), the priority should be on systems thinking and long-term outcomes. In this way a focus on Zero Waste for the solid waste management plan is appropriate. Care must be taken when prioritizing climate change as we have seen in the past where waste-to- energy was touted as a climate solution but a long-term and systems-thinking view (not to mention Metro Vancouver's own statistics) clearly show this to be a harm to the climate. In addition, some may see the use of a bio-reactor landfill as a solution but the fact that the landfill is designed to accelerate methane production and that a high percentage of methane escapes (and that methane is a very potent GHG, especially in the short term), means that the focus needs to remain on preventing organics going into landfills.

Big Idea 2 – this is an inappropriate idea for solid waste. If we care about the climate and the environment, the focus needs to be on prevention, not expensive end-of-pipe construction that needs ongoing waste. We oppose the proposals for an alternative fuels system created based on waste, the use of cement kilns as de facto incinerators and the ongoing use of the Burnaby Incinerator. A very close look needs to be done at the actual GHG impact of using biomass as fuel, both in the short term GHG impact as well as the long term, and based on the actual materials and their usual carbon cycles and length of time for those. Burning wood could actually be emitting hundreds of years worth of carbon in a short time and possibly cause the harvesting of more forests than a reuse system would. From a solid waste perspective, the energy component that may make sense is anaerobic digestion for source-separated organics where the end product is energy plus a high quality compost. The system would be scaled to the amount of ongoing food scraps and yard waste that can be expected after measures have been taken to reduce the unnecessary components (such as edible food waste). District energy systems need to be based on fuels that are ongoing, sustainably sourced and do not conflict with other goals. District energy should not be pursued using mixed municipal waste, nor waste incineration.

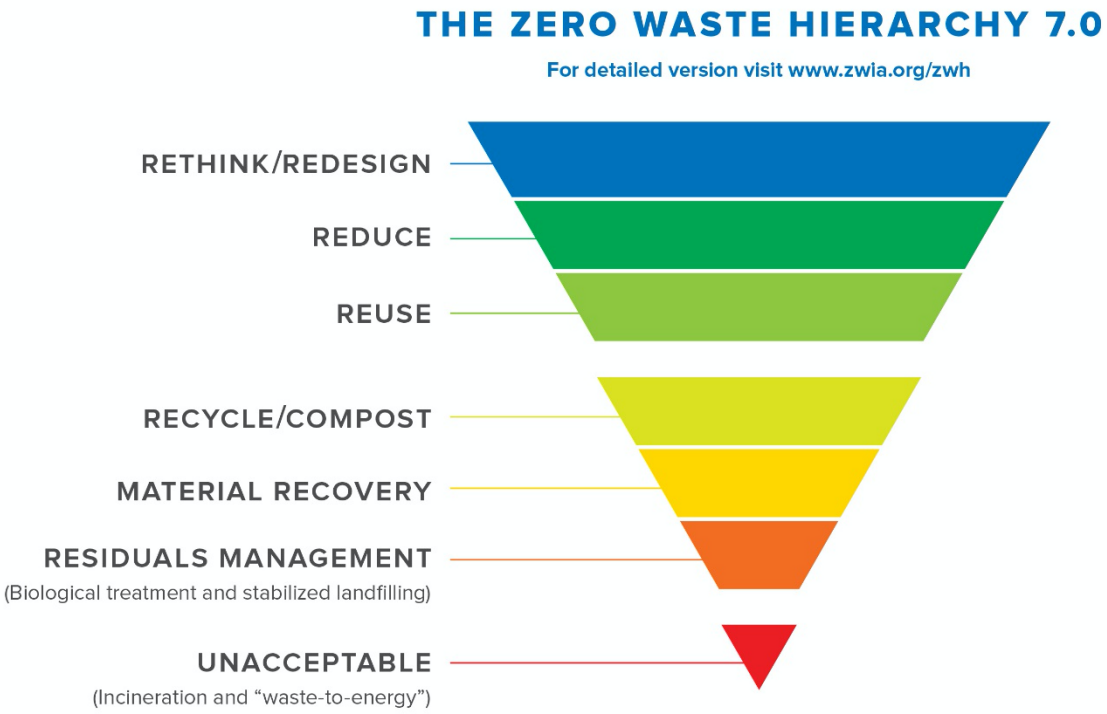
APPENDIX – INTERNATIONAL ZERO WASTE POLICIES

The International Zero Waste Definition

"**Zero Waste:** The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health"

Last Updated December 20th 2018

The International Zero Waste Hierarchy



ZERO WASTE HIERARCHY OF HIGHEST AND BEST USE (7.0)

PURPOSE

The Zero Waste Hierarchy describes a progression of policies and strategies to support the Zero Waste system, from highest and best to lowest use of materials. It is designed to be applicable to all audiences, from policy-makers to industry and the individual. It aims to provide more depth to the internationally recognized 3Rs (Reduce, Reuse, Recycle); to encourage policy, activity and investment at the top of the hierarchy; and to provide a guide for those who wish to develop systems or products that move us closer to Zero Waste. It enhances the Zero Waste definition by providing guidance for planning and a way to evaluate proposed solutions.

ZERO WASTE DEFINITION

Zero Waste: The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials, without burning them and with no discharges to land, water, or air that threaten the environment or human health. (Adopted by ZWIA December 20, 2018)

GUIDING QUESTIONS

Rethink/Redesign	What has led us to our present linear use of materials and thus, what needs to evolve to move towards a closed loop model? How do we re- design systems to avoid needless and/or wasteful consumption?
Reduce	What supports the use of less material and less toxic material?
Reuse	What supports the better use of those products we already have in ways that retain the value, usefulness and function?
Recycle/Compost	How do we ensure materials are put back in the materials cycle?
Material Recovery	What was salvaged from mixed waste?
Residuals Management	What is still left and why? What do we need to take out of the system that should not have been circulated in the first place? How do we manage what is left in a flexible manner that continues to encourage movement towards Zero Waste?
Unacceptable	What systems and policies encourage wasting and should not occur?

*** GUIDING PRINCIPLES**

Closed Loop Systems	Design systems to be closed loop rather than linear in their use of resources
Close to Source	Processes to occur as close to the source as practical
Conservation of Energy	More energy can be saved, and global warming impacts decreased, by reducing waste, reusing products, recycling and composting than can be produced from burning discards or recovering landfill gases.[1]
Do Not Export Harm	Avoid the export of toxic or potentially toxic waste or materials to poorer less developed nations and avoid the export of materials with limited, undefined recycling markets that will be either landfilled or incinerated in another region.
Engage the Community	Promote changes and systems that work with communities to facilitate meaningful and sustained participation, increase understanding, and influence behaviour change and perceptions
Highest and Best Use	Creating and keeping materials and products for a use as high on the hierarchy as possible and in the useful loop as long as possible. Keeping materials from being downcycled where the number of future uses or options are limited. Source separate items and materials to the extent necessary to ensure clean and marketable products and materials for reuse, recycling and composting streams.
Information & Improvement	Collect information on systems and use as feedback for continuous improvement
Local Economies	Support the growth and expansion of local economies (production, repair, and processing) in order to reduce greenhouse gases from transportation, improve accountability, and increase repair and parts opportunities
Materials Are Resources	Preserve materials for continued use and use existing materials before harvesting virgin natural resources
Minimize Discharges	Minimize all discharges to land, water or air that may be a threat to planetary, human, animal or plant health, including climate changing gases
Opportunity Costs	Consider opportunity costs of investments and ensure investments occur as high as possible on the Hierarchy
Precautionary Principle	Ensure that a substance or activity which poses a threat to the environment is prevented from adversely affecting the environment, even if there is no conclusive scientific proof linking that particular substance or activity to environmental damage
Polluter Pays	Whoever causes environmental degradation or resource depletion should bear the "full cost" to encourage industries to internalize environmental cost and reflect them in the prices of the products
Sustainable Systems	Develop systems to be adaptable, flexible, scalable, resilient, and appropriate to local ecosystem limits

[1] Source: http://zwia.org/standards/zw-community-principles/ .

ZERO WASTE HIERARCHY

1	**Rethink/Redesign**	Design and purchase products from reused, recycled or sustainably-harvested renewable, non-toxic materials to be durable, repairable, reusable, fully recyclable or compostable, and easily disassembled
2		Shift funds and financial incentives to support a Circular Economy** over the harvesting and use of virgin natural resources
3		Enact new incentives for cyclical use of materials, and disincentives for wasting
4		Facilitate change in how end users' needs are met from "ownership" of goods to "shared" goods and provision of services
5		Support and expand systems where product manufacturing considers the full life-cycle of their product in a way that follows the Zero Waste Hierarchy and moves towards more sustainable products and processes. Producers take back their products and packaging in a system that follows the Zero Waste Hierarchy.
6		Identify and phase out materials that cause problems for Closed Loop Systems*
7		Facilitate and implement policies and systems to encourage and support Local Economies*
8		Re-consider purchasing needs and look for alternatives to product ownership
9		Provide information to allow for informed decision-making
10		Be aware of and discourage systems that drive needless consumption
11	**Reduce**	Plan consumption and purchase of perishables to minimize discards due to spoilage and non-consumption
12		Implement Sustainable Purchasing** that supports social and environmental objectives as well as local markets where possible
13		Minimize quantity and toxicity of materials used
14		Minimize ecological footprint required for product, product use, and service provision
15		Choose products that maximize the usable lifespan and opportunities for continuous reuse
16		Choose products that are made from materials that can be easily and continuously recycled
17		Prioritize the use of edible food for people
18		Prioritize the use of edible food for animals
19	**Reuse**	Maximize reuse of materials and products
20		Maintain, repair or refurbish to retain Value**, usefulness and function
21		Remanufacture with disassembled parts; dismantle and conserve "spare" parts for repairing and maintaining products still in use
22		Repurpose products for alternative uses
23	**Recycle/Compost**	Support and expand systems to keep materials in their original product loop and to protect the full usefulness of the materials
24		Maintain diversion systems that allow for the highest and best use of materials, including organics
25		Recycle and use materials for as high a purpose as possible
26		Develop resilient local markets and uses for collected materials wherever possible

27		Provide incentives to create clean flows of compost and recycling feedstock
28		Support and expand composting as close to the generator as possible (prioritizing home or on site or local composting wherever possible)
29		Whenever home/decentralized composting is not possible, consider industrial composting, or if local conditions require/allow, anaerobic digestion
30	**Material Recovery**	Maximize materials recovery from mixed discards and research purposes after extensive source separation
31		If conditions allow, recover energy using only systems that operate at Biological Temperature and Pressure**
32	**Residuals Management**	Examine materials that remain and use this information to refine the systems to rethink, reduce, reuse, and recycle in order to prevent further discards
33		Ensure minimization of impacts by means of biological stabilization of fermentable materials.
34		Encourage the preservation of resources and discourage their Destructive Disposal or dispersal
35		Plan systems and infrastructure to be adjusted as discards are reduced and its composition changes
36		Minimize Gas Production and Release** and maximize gas collection
37		Use existing landfill capacity and maximize its lifespan. Ensure it is Responsibly Managed.**
38		Contain and control toxic residuals for responsible management
39	**Unacceptable**	Don't support policies and systems that encourage the Destructive Disposal of organics and/or the destruction of recyclables
40		Don't support energy and Destructive Disposal systems that are dependent upon the continued production of discards
41		Don't allow the Incineration** of discards
42		Don't allow toxic residuals into consumer products or building materials

**** Definitions:**

Biological Temperature and Pressure — The ambient temperature and pressure that occurs naturally without the use of added energy, or in any case not above 100 degrees Celsius or 212 degrees Fahrenheit.[2]

Circular Economy — An industrial economy that is, by design or intention, restorative and in which material flows are of two types, biological nutrients, designed to re-enter the biosphere safely, and technical nutrients, which are designed to circulate at high quality without entering the biosphere. Materials are consistently reused rather than discharged as waste.

Closed Loop System — A system not relying on matter exchange outside of the system, as opposed to open loop where material may flow in and out of the system.

[2] Unless higher temperatures are required, not to exceed 150 degrees Celsius, as a pretreatment (e.g. to control diseases, or reduce pathogens) to be then subject to composting or Aerobic Digestion; the pretreatment should never be used to destroy materials.

Destructive Disposal	Discarded materials placed in a landfill or in an Incineration** facility
Diversion	An activity that removes a material from Destructive Disposal.
****Incineration**	Incineration is a form of Destructive Disposal via combustion or thermal conversion/treatment, using temperatures above 100 degrees Celsius, of discarded materials into ash/slag, syngas, flue gas, fuel, or heat. Incineration includes facilities and processes that may be stationary or mobile, may recover energy from heat or power and may use single or multiple stages. Some forms of incineration may be described as resource recovery, energy recovery trash to steam, waste to energy, energy from waste, fluidized bed, catalytic cracking, biomass, steam electric power plant (burning waste), pyrolysis, thermolysis, gasification, plasma arc, thermal depolymerization or refuse derived fuel.
Minimize Gas Production and Release	This means keeping out source-separated organics as much as possible and biologically stabilizing the materials that go into landfill. For existing landfill cells that already contain unstabilized organics, the gas production should be minimized by keeping out rainwater and not recirculating leachate. Minimize methane release by permanently capping closed cells with permanent covers and installing gas collection systems within months of closure (not years). Maintain high suction on collection wells and do not damp down wells or rotate off the wells to stimulate methane production. Filter toxins in the gas into a solid medium that is containerized and stored on site. Note that this is not considered a renewable energy.
Problematic for a Closed Loop System	Materials that make it hard to recycle or compost the materials themselves or other materials. These may be contaminants for a material (like some forms of biodegradable plastics or stickers on fruit and vegetables) or materials that clog processing systems (like plastic bags)
Responsibly Managed Landfills	Manage landfills to minimize discharges to land, water or air that are a threat to planetary, human, animal or plant health. This must include plans for closure and financial liability.
Sustainable Purchasing	The purchase of goods and services that take into account the economic value (price, quality, availability and functionality) and the related environmental and social impacts of those goods and services at local, regional, and global levels.
Value	The importance, worth, or usefulness of something that may be economic, social, environmental, or sentimental.