WASTE WISE CITIES

UN HABITAT
FOR A BETTER URBAN FUTURE

Waste Wise Cities Newsletter #10

April 2021 - Materials Recovery Facilities

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Intro: Waste Separation

Globally 2.1 billion tonnes of municipal solid waste is generated annually, comprising of various fractions including organic or biodegradable waste, glass, plastic, metal, etc. Each waste fraction has an inherent value that can be maintained or exploited. For instance, organic waste can be used to produce animal feed and biogas or turned into compost, as we have shown in our last newsletter. A lot of plastic can be cleaned, shredded, and recycled into new products. However, if the waste fractions are cross contaminated, their inherent value is reduced as it becomes more difficult to process them. Consider the case of organic waste again: if mixed with plastic, glass, or any other waste fraction, it would be impossible to use as animal feed. In other cases, cross contamination affects the amount of waste ending up in landfills and the quality of the end-product and subsequent profits and livelihoods attached. Therefore, waste separation is a key element of sustainable waste management.

Waste separation means segregating/ categorizing waste into at least two broad waste fractions i.e., wet waste (organic) and dry waste (all others). Please note that there is no "upper limit" for the number of fractions. Separation can be done along the waste value chain, so either at source (where waste is generated e.g., households, restaurants, markets), at a designated facility after collection (e.g., Materials Recovery Facility (MRF), Integrated Resource Recovery Centre (IRRC)) or at the disposal points. The more waste separation moves away from the source, the more cross contamination will occur, reducing the quality. In this regard, it is important to understand that the number of separate fractions and the point of separation have different implications regarding operational and management capacities and finances. One possible model that balances the resources needs is introducing the separate collection of two (wet, dry) or three (organic, dry, residue) waste fractions at source, combined with further separation of the dry fraction after collection, for example in a MRF or IRRC.

A few benefits of having waste separation as integrated part of the overall waste management system are:

- Reduced waste quantities reaching landfills/dumpsites and associated costs
- High quality products and material substituting virgin raw materials in supply chains
- Reduced greenhouse gas emissions
- Promotion of a green economy
- Reduced environmental footprint

As mentioned, one way to harness these benefits are MRFs or IRRCs, therefore we took a closer look at them in our Waste Technologies Deep Dive Webinar Series, summarized on the following pages. You can have a look at the webinar recording here.

Solid Waste Materials Recovery Facilities in Southern Africa

This article was provided by Richard Emery, a civil engineering technologist and Executive Associate at JG Afrika.

Materials Recovery Facilities (MRFs) have been identified as key infrastructure required to support waste separation at source to enable further separation of recyclable waste, which is called "Clean MRF".

"Dirty MRF" are facilities that depend on non-separated waste, contaminated by moisture or organics and tend to have little market demand. This is therefore not sustainable in the current market under current legislative drivers.

Market demand is a key driver for the financial sustainability of an MRF. The supply of clean, consistent (in quality and type) materials (e.g. cardboard, white paper, glass, etc.) fetches higher prices as it means industry has less work to do to recover the benefit of the material for manufacture. Cost of logistics and consistency in supply (and quality) are also critical planning factors.

The cost for establishing MRFs vary widely. Ideally the MRFs must promote labour intensive processes, as has potential for sustainable job creation, a much-needed consideration in southern Africa.

The planning, design, implementation and operation of an MRF, whether large or small, follows a distinct project lifecycle. Figure 1 presents a typical project

lifecycle, which begins with understanding the supply side of the waste system and the market demand for recyclables. Setting the boundaries of the recyclable supply system allows the project planner to reduce the variables that need to be considered in the process design and physical infrastructure development. MRFs have great potential for job creation and sustainable waste treatment, which in the right context could be an important step towards achieving a sustainable waste management system.

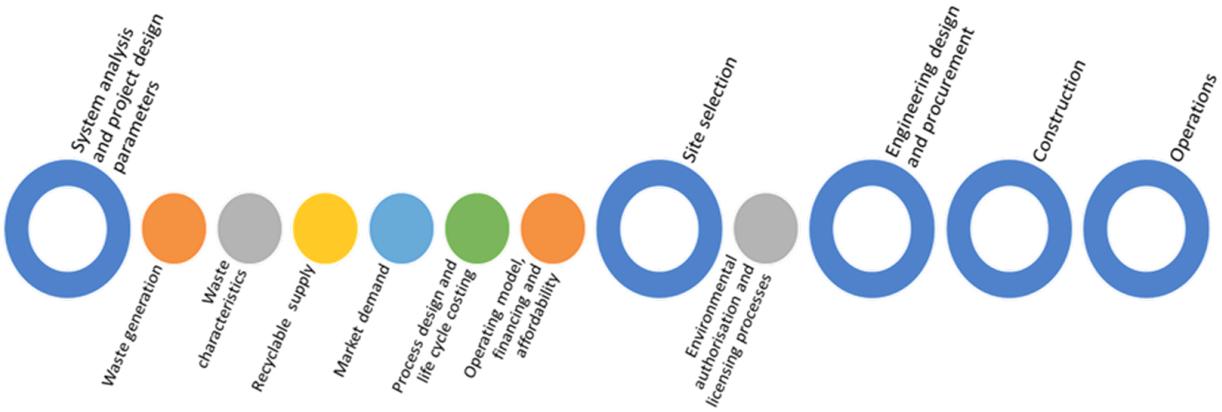

Figure 1: MRF Project Lifecycle

Materials Recovery Facilities in Qalyubeya, Egypt

For developing countries, Material Recovery Facilities (MRFs) can offer opportunities to find more sustainable solutions for challenging waste problems as well as improve livelihoods for disadvantaged communities dealing with waste on a daily basis.

The Integrated Resource Recovery Centre (IRRC) in Khanka City, Qalyubeya, Egypt was established within the context of the Community Based Solid Waste Management project, a community development project funded by the Bill and Melinda Gates Foundation and implemented by GIZ with the support of Qalyuebya Governorate through the Participatory Development Program in Urban Areas (PDP).


© Tawfik Elkheshen

The IRRC was designed to receive 100 tons of mixed waste daily and through both manual and mechanical processes the facility recovers recycled material, producing compost as well as refused derived fuel (RDF). RDF is increasingly being used by cement companies in Egypt as a substitute for traditional fossil fuels which facilitated the off take of RDF from the IRRC in Qalyubeya.

While MRFs can be tremendously beneficial in diverting waste from landfills and recovering value from waste, they can also be challenging to operate and sustain economically. This is particularly the case for dirty MRFs which receive mixed waste. To mitigate some of these challenges it is imperative that sound operator and business models are in place from the outset and that sufficient research is done to understand the quality and quantity of waste received as well as the dynamics of the offtake markets.

This article was provided by Tawfik Elkheshen, Middle East Program Manager for the Resources and Waste Advisory Group (RWA).

Material recovery facilities in the city of Buenos Aires, Argentina

This article was prepared by Melisa Wilkinson, New Technologies Operative Manager in the Ministry of Public Space and Urban Hygiene, Buenos Aires, Argentina.

In order to promote circular economy and divert waste from landfill, the City of Buenos Aires has implemented an integrated municipal solid waste management strategy based upon a differentiated collection and processing system for the recyclable waste stream.

Thanks to this public hygiene policy, Buenos Aires has different collection methods for the recyclable materials —such as door-to-door, drop off sites (known as Green Points) and recycling bin containers (deployed within 150 meters from every home)— which then are transferred by more than 130 trucks to the 16 Recycling Centers within the city.

Moreover, three of these Recycling Centers have been expanded to Material Recovery Facilities (MRF), which allows not only to improve the work performance (by increasing the overall processing capacity) but also the hygiene and safety conditions for the workers. These facilities are located strategically in the neighborhoods of Saavedra, Barracas and Villa Soldati, thus covering the city's north, east and most southern points in order to provide an efficient collection system. They are operated by Urban Waste Pickers Cooperatives (formalized waste pickers) who receive a subsidy, health insurance and other benefits from the city and also keep the earnings from marketing the recyclable output material. The capital and operational expenditures are borne by the City of Buenos Aires.

The MRF is divided in a preselection area, a classification area and a storage area. The classification area consists of a semiautomatic serial production line, which includes a drum feeder, Classification Conveyors, Air Separation (vacuum system), O.C.C. Screen, C.P. Screen, Optical Sorter, Magnetic Separator, Baler Machine and Return Conveyors. The MRFs can process between 10 and 12 tons per hour and are operated in 1 or 2 shifts, with about 70 workers per shift. Read more here.

Get to know our Affiliates

In this section we give our Waste Wise Cities Affiliates the possibility to introduce themselves.

Empower, a digital infrastructure for the circular economy

"Founded in 2018, Empower is a Norwegian technology company building a global plastic waste deposit system. By giving plastic a value, Empower crowdsources waste collection and segregation at source, helping local communities to create jobs and provide income opportunities for those who need it the most. Empower's digital tools provide both access to market, the ability to deliver traceable materials and alternative sources of funding for their collection activities through issuance of Plastic Credits.

All collected plastic is digitised and tracked through the value chain, creating a layer of trust and transparency, facilitating waste stream mapping and ensuring that plastic ends up where it has the highest value, and lowest cost, to society. Brands and producers benefit from sourcing high quality and reliable feedstocks with tracking data and product passports.

Empower has deployed its solutions in over 20 countries, incentivising the collection and tracking of 1900 tons of plastic waste, involving over 7000 people. Our work has been selected among the Top 25 SDGs projects to be showcased at Expo 2021 Dubai's Global Best Practice Programme, and has featured in Forbes and BBC mini documentary as a game changer initiative."


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SweepSmart - Happiness thrives if everybody wins

"SweepSmart is a Dutch-Indian social enterprise on a mission to realize zero-waste systems that make economic sense, serve the community, save the environment and create jobs to be proud of. We believe in a world in which every community has an efficient and modern waste sector as foundation for progress and prosperity in balance with nature.

But how can you realize smart waste management that entails a win for everybody? We help to make the leap from ambition to achievement! Having 50+ years of experience in waste management around the world, we build safe, efficient and inclusive waste management systems with global best practices tailored to the local situation.

We advise and engineer. Design and deliver. Connect and create. In short: we make it happen.

We've set up 11 Smart Waste Centres in India, Indonesia and Ghana, often run by informal waste pickers. Our solutions are scalable across different geographies with minor adaptations. We work hands-on together with local partners to realize fast and long-term sustainable change. For example, our first projects in India and Indonesia were up & running within 4 months and have been running independently since then."


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Waste Wise Cities Affiliates

Do you want to:

- → Support Waste Wise Cities and improve waste management in cities around the world?
- → Be an official partner of Waste Wise Cities and UN-Habitat?
- → Show up on the soon to be updated Waste Wise Cities website (after the update)?
- → Implement the Waste Wise Cities Tool?
- → Read about your activities in this newsletter?
- → Do much more?

Then contact us and become a Waste Wise Cities Affiliate! Together we can become Waste Wise!

Waste Wise Cities Updates

Waste Wise Cities Tool (WaCT)

In March, the Waste Wise Cities Team hosted two trainings on the Waste Wise Cities Tool for UN-Habitat employees. In total more than 70 colleagues attended the training, which had fruitful discussions about how the Waste Wise Cities Tool can be used in different cities. The Waste Wise Cities Tool will be applied to more than 50 cities across the world in 2021 with the support of UN-Habitat colleagues in different countries. If your city is interested in the WaCT application, send an email to wastewisecities@un.org for more information.

The WaCT has already been applied as part of UN-Habitat's HOCCI project, and due to COVID-19 travel restrictions Cagayan de Oro, Philippines, has become one of the first cities to conduct the WaCT by themselves only with remote support. The example from Cagayan de Oro shows that the application of the Waste Wise Cities Tool does not require carbon intensive air travel but can be successfully implemented with remote support only. Read the full story here

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Community of Practice on Solid Waste Management

24 February there was an Urban Basic Services Community of Practice meeting, an internal UN-Habitat meeting, on the highly requested topic of Solid Waste Management. We were joined by four presenters on different waste related topics. Andrew Whiteman from Wasteaware presented the Waste Wise Cities Tool, Voltaire Acosta from UN-Habitat Philippines presented the Healthy Oceans and Clean Cities Initiative, Fitsum Melaku from UN-Habitat Ethiopia talked about tackling plastic waste in the environment, and Anna Sobczak from the UN-Habitat PSUP Programme discussed how to turn waste into jobs. The session attracted a large audience from within UN-Habitat, and generated a great discussion, and the Waste Wise Cities team is happy that there is such an interest in Solid Waste Management within UN-Habitat.

Launch of Hawassa Dumpsite Rehabilitation Project in Ethiopia

UN-HABITAT Ethiopia, jointly with The Embassy of Japan and the City Government of Hawassa officially launched a project titled the "Emergency technical support to Solid Waste Management (SMW) in Hawassa, Ethiopia: The Implementation of Fukuoka Method as a Solution to Reduce Risks of Open Dump Site and Safeguard Public Health" in Hawassa, Sidama Regional State. The project is worth USD 750,000 and funded by the Government of Japan as a follow-up to the commitments made at TICAD 7 in Yokohama.

At the opening of the launching event, Japanese Charge d' Affairs H.E. Mr. Ida Toshio highlighted that the Government of Japan provided funds worth a total of over USD 3.1 million to UN-HABITAT for the "Emergency Support to Solid Waste Management in Ethiopian Cities" to be implemented at the open dumpsites in Addis Ababa, Bahir Dar and now in Hawassa.

In 2010, the city planned for a sanitary dumpsite (3.8 ha). However, the practice since then has been open dumping without cover soil or compaction. Currently, the dumpsite has already exceeded its capacity and is in a very poor and risky condition. This project is therefore a welcome contribution to improving solid waste management treatment in Ethiopia.


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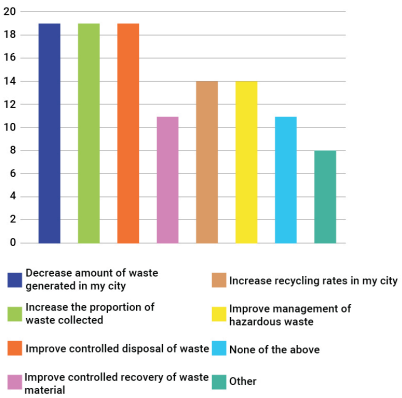
Waste Wise Cities Updates

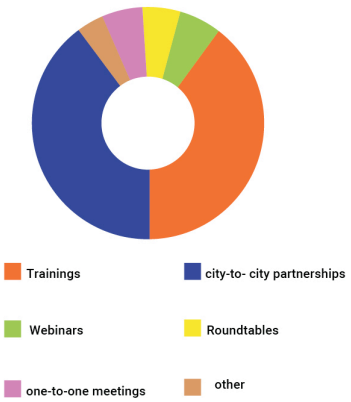
Member and Affiliate Survey Results

Waste Wise Cities and African Clean Cities Platform sent out a member survey last month to learn what our members and affiliates would like more of in the future. In general, the respondents were satisfied with the information shared, especially on funding opportunities, trainings, workshops, and webinars. The number one thing the respondents want more of regarding information, is information about funding opportunities. And the opportunities from WWC and ACCP that generated most interest, was trainings and city-to-city partnerships. Furthermore, many of our Members and Affiliates answered that since joining WWC and ACCP they have improved their solid waste management systems one or more ways. WWC and ACCP will take the results of the survey into consideration when planning future interventions with our Members and Affiliates.

Since you joined Waste Wise Cities/ African Clean Cities Platform, have you been able to:



Which opportunities that WWC or ACCP offer are you most interested in?



Which kind of information are you most happy to receive emails about?

What information do you wish you received more of?

IMPLEMENTING THE NEW URBAN AGENDA

11 SUSTAINABLE CITIES AND COMMUNITIES

Call to Action

- → Look for companies in your city that recover waste and give them your recyclables!
- → Make a compost bin at home, to ensure that wet and dry waste do not get mixed!
- → Reach out to your city local representative and ask them about the process to improve solid waste management in your city!
- → Become a Waste Wise Cities member or affiliate and share your good practices with us!

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