

Sharjah's Path to Resource Recovery: A Paradigm Shift in Waste Management

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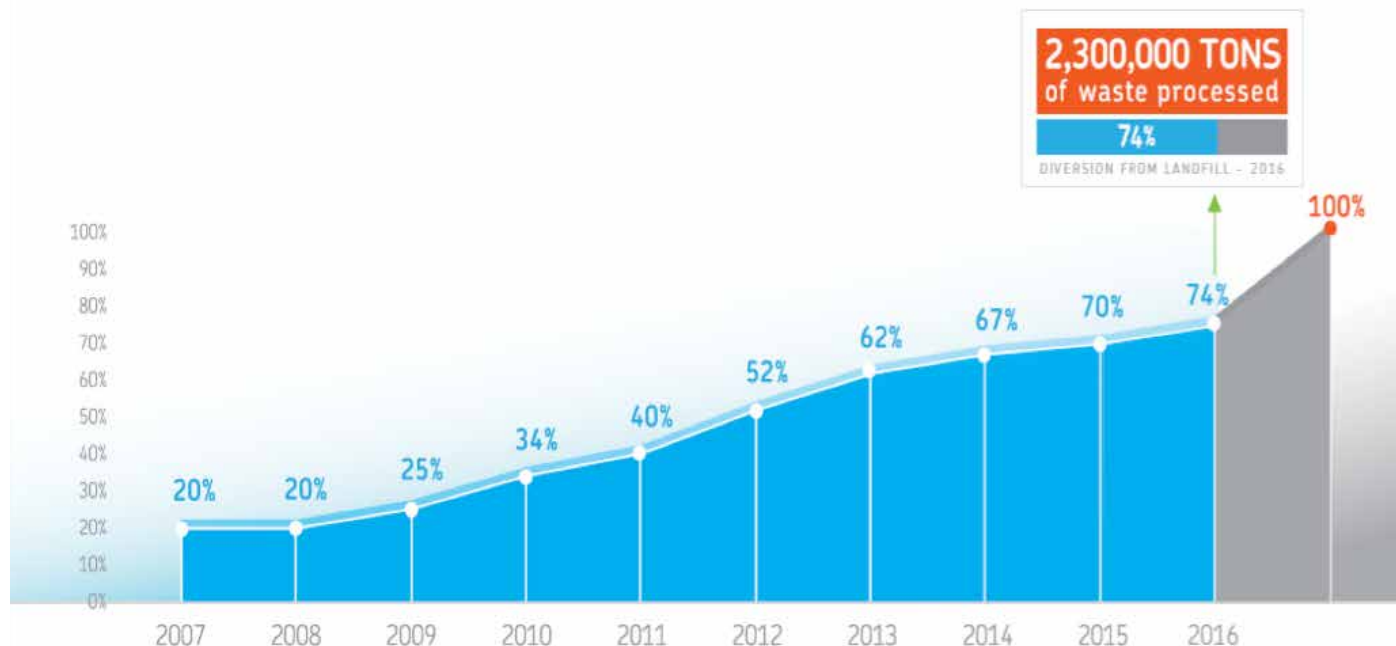
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In 2006, waste diversion rates in Sharjah stood at a dismal 20%. HH Sheikh Dr. Sultan bin Muhammad Al-Qasimi, Member of the Supreme Council and Ruler of Sharjah, recognised that proper disposal and treatment of waste was pivotal to ensuring the sustainable growth of the emirate. With urbanisation, infrastructure development and the growth of a highly diversified population, waste production and composition patterns were drastically changing, necessitating new disposal and treatment techniques. Bee'ah was formed in 2007 in recognition of this need and since then, we have implemented a waste management strategy for the emirate that is regenerative and restorative in design. Through this strategy, Sharjah is now diverting 74% of its waste away from landfill, achieving one of the highest diversion rates in the Middle East.

WASTE DIVERSION

The Bee'ah journey towards ZERO-WASTE to landfill



The Importance of Proper Disposal



Figure 1: Bee'ah's green and blue waste collection bins

When dealing with the issue of waste, proper disposal is the first, and most critical, step to ensuring that all subsequent processes can be carried out effectively. Every year, Bee'ah collects around 2.3 million tonnes of waste from residents and establishments in Sharjah. To ensure that the waste we collect can be recovered or put to use in processes like waste-to-energy, it is important for us to advise waste generators on how to segregate the waste at the source. Inert and high moisture content fractions should be separated to prevent decontamination and to increase the likelihood of treatment options like energy generation. We have organised residential recycling programmes and distributed green and blue bins, dedicated to general and recyclable waste, to encourage the separation of waste streams by the public. These practices ensure that only a minimum of waste collected in Sharjah is disposed in landfills.

The Case for Waste Processing & Treatment

The primary aim of waste processing and treatment is diversion of waste from landfill. In a region like the UAE where the average individual produces 2.7 kg of waste per day, waste is accumulating rapidly

in landfills. If left untreated, this will not only consume valuable space and affect the aesthetic value of the landscape, but also release harmful gases like methane, which is 18 times more poisonous than CO₂. This contributes to alarming issues like global warming. Through a strategic combination of waste collection and treatment methods, Bee'ah has managed to triple diversion rates in Sharjah.

In addition to boosting diversion rates, waste treatment also provides the dual benefit of preserving resources, and of adding value to the economy through the reintegration of recycled products. Waste treatment is the driving force behind the adoption of a circular economy. In today's growing economy, resources are being depleted faster than they can be regenerated. When we use and dispose of a resource, we lose the value and energy contained within it as well. Through treatment, resources are repurposed and restored to forms where they continue adding value and producing energy, thus sustaining a loop of recovery that saves time, effort and money.

Instrumental Role of Advanced Recycling Facilities



Figure 2: Bee'ah's retrofitted Material Recovery Facility

One of the pivotal requirements for extracting value from waste is the availability of proper recycling facilities that can facilitate this process. The UAE and the Middle East, in general, has very few state-of-

the-art facilities dedicated to the process of resource recovery. By investing in advanced technology, we can ensure greater recovery and treatment of finer materials which would otherwise be dumped in landfills. Bee'ah was one of the first companies in the Middle East to establish a waste management centre, with advanced recycling facilities for specific types of waste. We currently have facilities which process materials like paper, plastic, tyres, vehicles, metal, and construction & demolition waste, with facilities for wood, industrial liquid and oil, plastic film, PET plastic and others now under way. The efficient processing of these materials helps us to ensure sustainable growth and complete recovery of recyclable materials.

Bee'ah's Material Recovery Facility (MRF) is the largest of its kind in the UAE, and one of the best in the world. Possessing an annual capacity of over 500,000 tonnes, it processes around 2000 tonnes of recyclables every day. Recently, the MRF underwent a retrofit that was developed by Oregon-based Bulk Handling Systems, featuring Bag Breakers, Optical Sorters and Nihot air separators. Following the retrofit, the MRF is now recycling an impressive amount of plastics, recovering 69 million pieces (equaling 1700 tonnes) in November alone. This has made the facility the biggest recovered plastics producer, out of the mixed household recovery facilities in the world. Since plastic constitutes a major component of the household waste generated in the UAE, we have been able to turn this non-biodegradable waste from a cause of concern, into a resource opportunity for our economy through its recovery.

Construction waste constitutes 50 per cent of the waste generated in Sharjah. With a recovery rate of around 95 to 97 per cent, Bee'ah's Construction and Waste Demolition Facility has ensured that most of this waste is diverted from the landfill. Every year, the facility processes around 500,000 tonnes of concrete, bricks, wood, insulation and asphalt.

Accounting for the increasing number of automobiles on Sharjah's roads, Bee'ah has also established a Car and Metal Shredding and Recycling Facility as part of its integrated waste management solution. Our facility houses the world's most powerful shredding

machine to date, the Red Giant, which can shred a car in just 60 seconds. The facility also shreds light metal scrap, segregating the individual metal, glass and plastic components for recycling.



Figure 4: Bee'ah's Car & Metal Shredding & Recycling Facility

The increasing number of vehicles have also led to the accumulation of tyres in landfills. Bee'ah's Tyre Recycling Facility caters to this problem by using state-of-the-art cryogenic processes to recycle over 9000 used tyres every day, achieving remarkable recovery rates.

Resource Opportunities in Waste Treatment

Recovery presents a number of resource opportunities, right from new raw materials to recycled components that can be reintroduced into the economy, fueling a diverse revenue generation model, which improves future resource security.

Products recovered from Bee'ah's Construction and Waste Demolition Facility are used as aggregate for roads, pavements and walkways, while the crumb rubber derived from our tyre recycling process is used to create running tracks, grass-surfaced and stadium playing areas, miniature golf courses and artificial turf infill. In fact, the jogging track on Al Majaz Waterfront was produced using 6000 tyres that were recycled by Bee'ah.



Figure 5: Rubber tiles produced from recycled tyres, at Bee'ah's Tyre Recycling Facility.

Apart from the generation of materials, waste treatment can also produce energy. Bee'ah has joined forces with Masdar to deploy waste-to-energy projects across the UAE. We are now building Sharjah's first waste-to-energy plant, which will incinerate non-recyclable waste to produce 30 MW of energy. With increasing urbanisation, high calorific waste is increasing in Sharjah and this can be put to maximum use through projects like these.

With the UAE now implementing government initiatives like Green Economy for Sustainable Development, the UAE Green Agenda 2015-2030 and the UAE Vision 2021, recovering value from waste is presenting a bigger opportunity than ever before. Bee'ah is adhering to a decade-old commitment to ensuring that Sharjah exploits the potential of these opportunities, to continue to be a driving force for sustainable economic development in the UAE.