

An overview of the plastic waste and recycling status in Qatar

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Abstract. It has been calculated and reported that the average Municipal Solid Waste (MSW) generation rate per capita in the Gulf Co-operation countries (GCC) is approx. 1.5 kg/person/d, with Qatar reaching almost 1.4 kg/person/d, thereby ranking the Gulf States amongst the top waste generating countries globally. Plastics, accounting for approx. 13–14% of the total MSW (in these countries), constitute both a significant amount and a valuable resource to be recovered. In the present work, an attempt is made towards delineating the plastic waste and recycling status of the country, based on recent governmental reports.

Keywords: Plastic waste, Recycling, Recovery, Qatar, Circular Economy

1. Introduction

Municipal solid waste (MSW) management is regarded as priority environmental issue within the Gulf cooperation council (GCC) region. Qatar is at the top of the GCC countries with an approx. MSW amount of 1400 g/person/d, as recorded in the last decade. Plastics, representing a c.a. 13-14% of the total MSW (in the Arabian region), constitute not only a substantial amount, but also a valuable and recoverable resource. However, there are various technicalities that restrict their efficient recovery and recycling (Hahladakis et al., 2018; Hahladakis and Iacovidou, 2018; Iacovidou et al., 2017)

The State of Qatar has recently launched its national vision (QNV2030) underlining, therein, its attempt to strive towards obtaining and maintaining sustainability. Nonetheless, increased immigration, huge construction projects, in view of the upcoming FIFA World Cup 2022, and an overall rapid development have created an alarming waste management situation that the majority of the experts in the field would, possibly, deem as unsustainable.

The complete lack or low landfilling fees together with the wide availability of land that is mostly comprised of sand and/or gravel, render the recycling route unappealing and in, some cases, even

economically unviable. Due to an insufficient waste management infrastructure, landfilling remains the prevalent waste disposal method in the State of Qatar.

2. Plastic consumption and waste generation status in Qatar

The consumption of plastics in the State of Qatar, in 2015, was estimated at around 240 kt (GPCA, 2015). However, the respective waste stream recovered in the same year was not more than 30 kt (thus, only approx. 12.5% of the overall consumption).

Plastic waste (PW) in the country can be mostly found in a) the MSW or b) the waste electrical and electronic equipment (WEEE) (QDB, 2017). Furthermore, local plastic recovery facilities (PRFs) usually sign rolling contracts and long-term agreements with commercial entities to have this type of waste sourced. The most recent estimates report on a ca. 14% of plastics within the MSW generated in Qatar (MDPS, 2014, 2017).

The amount of PW that was generated in the country (2010-2016) exhibited a ca. 50 kt increase; thus a yearly growth rate (AGR) of approx. 6.7% (MDPS, 2017). This increase can be mostly attributed to: a) lack of a proper waste management infrastructure, b) public unawareness of sound waste disposal methods, c) rapid population growth, d) lavish living lifestyle, and e) “mega” construction projects due to the upcoming 2022 FIFA World Cup.

Hence, governmental and local entities are, also, striving towards reducing the future MSW generation rate, with the intention of adopting eco-friendly solutions and by educating and incentivizing the public.

3. Plastics recovery and recycling status in the State of Qatar

The types and percentages of plastics that are usually and easily recovered in Qatar are: a) HDPE (25%), LDPE & LLDPE (55%), PP (15%) and

others(5%) (MDPS, 2014). More specifically the State of Qatar aims at a 38% recycling rate out of the country's total MSW, by 2030 (GSDP, 2008); this is considered a huge step from the recently reported percentage of ca. 4% (Kader, 2016) or even the much older of 8% (GSDP, 2008), depending on year and sources. This has led to the creation of several PRFs (e.g. *Doha Plastic Recycle*, *Twyla recycling* and *Asima Plastic Factory*) that are currently operating in the country.

3.1. Description of the most recognizable PW business models (BMs) operating in Qatar

Given the small number and operational scale of the aforementioned PRFs, there are currently two regional business models (BMs) that are mostly implemented in the Qatar. **BM1:** where the collection and sourcing of PW is done in two ways: either by a) a waste management company or b) a recovery facility (PRF). In the first case, the waste management companies collect the waste in a commingled form, either from households or from industries operating in the State, and, in turn, sort the waste according to fractions (organic, plastic, metal, paper, etc.). This way, plastic is separated and sent to PRFs. **BM2:** according to this model, the collection of waste is mostly done by waste management companies that collect mixed industrial or household scrap, etc. The plastic fraction is then sorted and sold to trading companies; there, it is either further sorted - per polymer type- or directly packed and internationally exported. Should the trading companies intend to sell it to a domestic PRF, they would need to sort it per polymer type; otherwise, local PRFs will prefer collecting it directly from the waste management companies, since local recovery facilities do tend to do that (even if it is unsorted PW).

4. SWOT description on Qatar's plastic recovery-recycling market

Considering the aforementioned points on the waste plastics recovery-recycling situation in the country, a SWOT description is provided below.

Strengths: i) Plastics constitute one of the largest recyclable fractions found in Qatar's MSW stream, accounting for approx. 13%, ii) existing PRFs tend to backward integrate the setting up of any recovery facilities and leverage on creating customer relationships.

Weaknesses: i) Manual separation is required to segregate the plastics into the various polymer types, ii) lack of sorting facilities and/or equipment lead a large percentage of the collected plastics to landfill, iii) in PET bottles, caps are manually removed.

Opportunities: i) Given that plastic recovery demand is expected to grow in the near future and a small capital is required for setting up a PRF unit this presents an opportunity for new businesses on that sector, ii) increased preference for recyclable plastic packaging materials, iii) recovered plastic pellets can be internationally exported.

Threats: i) Qatar has a large availability of virgin plastic material so this may lead to less focus on the recovered one, ii) collection of waste is not currently regulated in the country so any private company can initiate a waste collection via tie-ups.

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