The plastic recycling opportunity

An industry ready for consolidation

Realizing value series

Demand for recycled plastics in Europe is increasing, driven by legislation, economics and the need for sustainable use of resources. However, the recycling sector has not yet been able to fully benefit from these favorable fundamentals due to quality issues and a lack of investment in recycling processes. In a highly fragmented market, these dynamics present unique investment prospects for consolidation. Everybody’s talking about recycling – now is the time to grab the moment.

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The production and disposal of plastics put an enormous burden on the environment – something discussed in greater detail in KPMG’s recent paper, *To ban or not to ban.*

Every minute, more than one million plastic bags are thrown away after an average use of just 15 minutes. According to Peter Thomson, UN Ambassador for Oceans, “plastic pollution has dire consequences for the future of many species, including humankind.”

This challenge has put plastic recycling very high on the agenda of the World Economic Forum, the European Commission and many other organizations, senior politicians and, perhaps most importantly, the general public. Legislation and escalating customer awareness have increased the volumes of plastic waste collected for recycling in Europe, which grew by 6 percent a year between 2012-2016, with further rises anticipated towards 2020.

Demand for recycled plastics from large brand owners and industrial buyers is also increasing, driven by financial considerations, sustainability targets and customers’ desire for environmentally-friendly products.

Despite these favorable conditions, the plastic recycling sector remains very fragmented and relatively immature, which is holding back recycling efficiency, quality and profitability.

Industrialization – achieved through investments in technology and operational excellence – would result in higher yields, product quality and revenue. Furthermore, consolidation would result in economies of scale in operations, sourcing and sales. The industry lacks the means to invest and consolidate, as it consists of smaller companies with limited access to capital. Outside investment is, therefore, required to seize the opportunity.
Figure 1: Six arguments for consolidation in European plastic recycling

1. Favorable fundamentals such as rising supply and demand and legislation.
2. A highly fragmented industry where large players are more profitable.
3. Increased scale would enhance negotiating power with suppliers and buyers.
4. Automation and standardization, which is still limited, can increase yields and reduce costs.
5. Investments in technology can increase output quality and revenues.
6. Larger companies can better handle pricing volatility and investment uncertainty.

Figure 2: Plastic recycling value chain

Plastics products

Consumption

Sorting

Recycling

Conversion

Leakage

Plastic waste

Landfill

Incineration

Waste

New (virgin) granulates

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An increase in recyclable plastic

Regulation and heightened consumer awareness are driving up the supply of sorted plastic waste.

Plastic recycling is a hot topic that is constantly in the headlines and the market growth potential is huge. According to the most recent published figures, just 31 percent of all plastic waste collected in Europe was recycled, with the remainder either incinerated (causing CO2 emissions) or landfilled (squandering land). For plastic packaging specifically, the recycling percentage for collected waste is a bit higher at 41 percent.\(^7\) When you consider the volume of plastic that is not even collected but leaks into the ecosystem, then the recycling percentages are even lower.

Given the environmental benefits of recycling plastic waste, the European Union (EU) has recently tightened recycling targets for its member states. The latest Circular Economy Package requires 55 percent of plastic packaging waste to be recycled by 2030 (compared to 41 percent in 2016) and a ban on landfilling of separately collected waste.\(^8\) Both the EU and national governments are taking measures to reach these quotas; these include expanding the types of plastic packaging materials collected from households and deposit schemes for plastic bottles.\(^9\)

Together with growing consumer awareness, these regulations are driving up supply for recyclers which KPMG estimates to grow 10 percent year-on-year from 2016.

Figure 3: European plastic waste sent to recycling facilities (in megatonnes)\(^10,11,12\)
Demand is growing swiftly

Financial and sustainability considerations are impacting demand.

Regulation is not the only factor influencing plastic recycling. Firstly, recycled plastics trade at a 20-40 percent discount\(^1\) to ‘virgin’ (new, oil-based) plastics, making it financially attractive to plastic converters. The higher the price of oil, the more attractive recycled plastics become. Given the long-term scarcity of oil, the financial benefit might increase over time.

There is also far greater awareness of sustainability. Both industrial buyers of recycled plastic granules (regranulates) and end-consumers of plastic products are increasingly conscious of the environmental impact of their actions. Several major European companies like IKEA, P&G and LEGO use recycled instead of oil-based plastics. More and more end-consumers appreciate the use of recycled plastic in new products and are able to better sort their plastic waste:

“Several companies like Coca-Cola and Danone are setting minimum quotas for the use of recycled plastics.”
– Recycler (Management)

“Unlike a few years ago, where companies regularly switched between recyclate and virgin depending on the price, companies that use recyclate nowadays design their production process accordingly and stay with it.”
– Converter (Management)

“Our strategy is to use more renewable materials and keep recycling as the centre of our value proposition.”
– Converter (Procurement Director)

“Currently, we use 100 percent virgin, but we are planning to change to 80 percent pure recyclate.”
– Converter (Product Manager)
Exciting growth potential

European plastic recycling has consistently outgrown the overall plastics market and has ample room for growth. According to recent figures, Europe processes approximately 50 megatonnes (Mt) of plastics per year with an annual growth rate of 2 percent between 2012 and 2016,\textsuperscript{14} which is in line with economic growth.

Demand for recycled plastic grew significantly faster over the same period – by 17 percent.\textsuperscript{15} There was an uptick from 2015 to 2016 in Europe due to Chinese import restrictions (see figure 4).

![Figure 4: European plastic demand, 2012-2020 (in megatonnes)](image)

China

Until 2013, approximately half of total plastic waste in Western Europe was exported to Asia, primarily China, in order to fulfill the need for raw materials. However, China has imposed quality and import restrictions in light of environmental concerns around the import of highly contaminated plastic waste.

The first of these was ‘Operation Green Fence’ in 2013 followed by sharpened inspections in 2015 and ‘National Sword 2017’. The fall in imports was also driven by lower economic growth and decreasing demand for plastic, as well as China’s desire to protect its domestic recycling industry.

In 2019, other Asian countries such as India and Malaysia followed China in limiting plastic waste imports.

Although these declines have been partly balanced by increased imports of intermediate waste products (called regrind), the overall percentage of European plastic waste exported to Asia has diminished since 2013 and is expected to decline further. This has given rise to increased supply and lower prices of plastic waste bales in Europe.\textsuperscript{19,20}

The increased supply of plastic waste was absorbed into the market due to favorable pricing and increased sorting and recycling capacity in Eastern Europe. Even excluding this effect, the growth rate was still a healthy 9 percent.\textsuperscript{18}

Given the global transformation towards circular economies and lower carbon emissions, plastic recycling will increasingly replace virgin plastics production. Market participants consider recycled plastic to be the most important alternative to virgin plastics, as compared to other circular alternatives such as bioplastics. This view is supported by European legislation, which focuses strongly on litter reduction and thereby recycling, rather than bio-based or bio-degradable plastics. This paper focuses on mechanical recycling, as chemical recycling is not (yet) economically feasible on a large scale.
Obstacles to buying recycled plastic

Despite strong growth, penetration of recycled plastics is estimated at only 8 percent of the overall plastics market – and forecast to reach 10 percent by 2020.

Three key obstacles are holding back a decisive breakthrough:

1. Recycled plastics are inferior to virgin plastics

KPMG professionals conducted extensive interviews with plastics convertors reveal concerns over the quality and consistency of recycled plastics. Consequently, recycled plastics are often “downcycled” towards lower-value applications, such as garbage bags and crates. However, this is not always the case, as referenced on page 11.

“The quality must be sufficient for my end-customers. They want the same quality as from virgin.”
– Converter (Representative)

“For my B2B product it does not matter if there is a scratch or some traces of other materials in the plastic. However, for a smartphone case this is different.”
– Converter (Product Manager)

“We have done extensive testing and our products made of high-quality recyclate can be of the same quality as virgin-made products.”
– Brand owner (Representative)
Case study: Plastic recyclers searching for the right waste

Plastic recyclers tend to specialize in one or a limited number of plastic types such as HDPE, LDPE and PP, to name a few. Recyclers produce regranulates for industrial buyers, with whom they agree various quality standards around criteria such as density, melt-flow index and stability.

In order to guarantee product quality and quantity, plastic recyclers seek plastic waste bales with specific criteria. These often need to be sourced from various countries, which can be challenging due to the different collection schemes and sales methods for plastic waste. For example, Germany’s competitive system, with several collection schemes and collecting companies, produces a relatively high proportion of contaminated waste. In Italy, on the other hand, Corepla has a monopoly and invests more in an efficient sorting process, reducing contamination levels.

Understanding and analyzing the sourcing of waste, both quality and quantity, is key for investors or companies interested in the sector.

2. Virgin plastics remain price-competitive given relatively low oil prices

High virgin prices can incentivize plastic converters to switch to recycled plastics, but the current low oil price is not high enough to make a switch attractive.

3. Regulatory restrictions for food packaging

The European Food Safety Authority (EFSA) regulates the use of recycled plastics in food packaging, as chemicals can migrate from the packaging into food. There are three ways to use mechanically recycled plastics in contact with food: waste from the manufacturing site that has not been in contact with food; ‘functional barriers’ which is recycled plastics between layers of new plastics; and post-consumer recycled plastics from processes authorized by the EFSA in line with EU regulations. Consequently, very few recycled plastics can be used in food packaging, although the EU plans to authorize over 100 new ‘food safe’ recycling processes that might increase usage.

Improving the sorting process

Certain plastics, when recycled, are of higher quality, notably Polyethylene Terephthalate (PET), which is used for most soft drinks. Recycled PET has (at least) price parity with virgin PET, so it is vital that collectors separate this waste from other forms of plastic, notably the polyolefin family, which includes High-density polyethylene (HDPE), Low-density polyethylene (LDPE) and Polypropylene (PP). Prices for recycled plastic such as HDPE and PP can be as much as 20-40 percent lower than their virgin versions.

The quality of waste for these other plastic types can be improved by regulations that encourage better pre-sorting at households. Sorting standards in Europe change frequently and vary by country. Some regions have even switched to post-sorting of plastics from municipal solid waste. Another way to improve recycling is to produce packaging that easily decomposes, which allows better sorting and therefore better product quality. Many studies and other initiatives have focused on (regulation of) collection, sorting, and stimulating demand. However there are also a number of opportunities to make the actual recycling companies more efficient, effective and profitable.
Inefficiency and lack of investment

Recycling companies are at the heart of the plastic recycling value chain, but in an immature and fragmented sector, efficiency, quality and profitability all have room for improvement.

After plastic is collected and sorted by waste management companies, recycling companies convert waste bales into recycled plastics through a process of shredding, washing, further sorting and extrusion. The key challenge is to maximize the recycling yield (the ratio of recycled output to waste input) and quality (minimal contamination), while minimizing costs.

However, many plastic recycling companies have insufficient standardization, industrialization and operational excellence in their operations. This is largely due to the nature of the sector, which is characterized by small, entrepreneurial companies, with management teams that often have limited experience in the professional plastics industry.

There are approximately 1000 recycling companies across Europe and the combined market share of the four largest is estimated at just 17%. Even these players cannot match the resources of international petrochemical plastics manufacturers, which are primarily large, integrated multinationals. The high fragmentation also hinders the bargaining position with key suppliers (large waste management companies and plastic waste schemes) and key clients (large brand owners and plastics convertors).

Figure 5: Output capacity of European plastic recycling companies in 2018 (in kilotonnes)
As a result, industry profitability is relatively low, with average earnings before interest, tax, depreciation and amortization (EBITDA) of approximately 5 percent between 2012-2017. Modest profitability offers recycling companies little room to adapt to volatile virgin plastic prices. But more importantly, it limits the ability to invest in better recycling techniques that could reduce the current high costs and make much-needed quality improvements. This in turn impacts recycled plastics’ penetration and profitability; a vicious circle which cannot be broken by simply raising output prices, as quality is insufficient and/or virgin plastics are too cheap.

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Figure 6: Market shares or recyclers in output capacity, 2018²⁸

Note: Total capacity based on an estimated market volume of 4.7Mt in 2018 (see figure 4) and a KPMG estimated utilisation rate of 85% based on market feedback

Sources: Company websites, interview program, Plastic Recyclers Europe, CapitalIQ, KPMG analysis

Figure 7: Financial performance of selected key competitors¹², 2014-2017

Notes: (1) Only key players are compared due to availability of data; (2) Player 4 excluded due to lack of available data; (3) Revenue CAGR and EBIT average for 2015-17; (4) Revenue CAGR and EBIT average for 2014-16; (5) Revenue growth and EBIT average for 2016-17.
A breakthrough with consolidation

Investing in industrialization and consolidation can increase efficiency, profitability and quality.

The current state of the recycling industry, highly fragmented with ample room for improvement, offers a unique investment opportunity to industrialize and consolidate.

Standardization, professionalization and investment in the latest technologies can help increase efficiency to increase yield, product quality and revenues. Furthermore, larger factories – through consolidation – would result in economies of scale. Enhanced scale should also strengthen recyclers’ negotiating position for buying waste input and selling recycled output, which would improve margins. Bigger companies also bring more power to the debate on plastics recycling with governments and the EU. Additionally, there should be more funds available to invest in technology that improves quality, which in turn can boost price and demand for recycled plastics.

The success of Dutch plastic recycling company QCP, owned by SUEZ, LyondellBassell and a local private equity fund, is evidence that investments in technology and scale bring rewards. With its advanced factory, QCP produces recycled HDPE and PP of very high quality, which is sold for high-end applications at corresponding rates (rather than ‘downcycling’). Larger plastic recycling companies tend to enjoy higher profitability than smaller ones (see figure 7), thanks to various benefits shown in figure 10.

However, as the industry emerged from small-scale companies with limited access to capital, few players have the means to invest and consolidate. This gives investors the chance to realize the sector’s potential by employing a buy-and-build strategy: combining input volumes from several recyclers and processing them in an (new) efficient factory with the latest technology.
Limited penetration of recycled plastics

Quality recycled plastics is insufficient for many applications

Prices cannot be raised

Virgin plastics are still price competitive

Regulation on food packaging

Limited investments

Recycling is costly (and not optimized)

Low oil price

Limited profitability

(Sorted) waste is of limited quality

Figure 8: Recycling industry dynamics (before external capital)

Increased penetration of recycled plastics

Quality recycled plastics improves

Prices can be raised

Relative price attractiveness of virgin plastics decreases

Regulation on food packaging

Investments in large professional facilities

Increased efficiency, lowering costs

Increased profitability

Low oil price

Figure 9: Recycling industry dynamics (powered by external capital)
**Figure 10: The benefits of scale and investments in plastic recycling**

<table>
<thead>
<tr>
<th>Process step</th>
<th>Procurement of plastic waste</th>
<th>Shredding</th>
<th>Washing</th>
<th>Further sorting</th>
<th>Extrusion</th>
<th>Sales of recycled plastic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Buying sorted (by plastic type and/or colour) plastic waste bales, mostly from waste management companies.</td>
<td>Shredding the plastic into small pieces.</td>
<td>Washing off labels and other impurities with lye, through sink-float machines or centrifuges.</td>
<td>Filtering out waste and unwanted plastic types and colors.</td>
<td>Melting and pressing through an extruder.</td>
<td>Selling recycled granulates to plastic converters.</td>
</tr>
<tr>
<td>Benefits of increased scale/investments</td>
<td>Enhanced negotiating power results in lower cost per ton.</td>
<td>Larger shredders result in lower processing costs per ton.</td>
<td>Investments in the best washing techniques (centrifuges, hot wash) removes more waste and improves output quality.</td>
<td>More advanced and automated processes such as the use of (multiple) flake near-infrared will increase purity (color and type of plastic type), which strongly increases output quality and therefore sales prices.</td>
<td>Larger extruders result in lower processing costs per ton.</td>
<td>Enhanced negotiating power results in a higher price per ton.</td>
</tr>
</tbody>
</table>

Lower water and energy bills

Processing costs can be reduced through automation of logistics between the recycling steps, which is still manual in many recycling factories

This market solution is not without its challenges, but these can be overcome. Contracts are needed in order to secure input and sales, but there is a free market for both waste and recycled output. Also, synergies can, and should, be questioned for each business case. Finally, a large upfront investment is required to build a new factory and/or acquire companies.

There are other possible scenarios. Output quality and prices might only be increased through a separate collection system like PET. Separate collection results in the purest sourcing and output stream.

However, advanced and automated recycling techniques can go a long way to increase the quality levels of plastics which are not separately collected. Even the largest players must accept that government policies are uncertain, can take many years and vary by country. Regardless, every nation needs recycling companies to reach recycling targets, and the more efficient and advanced companies will benefit the most.
A number of large players from adjacent industries have woken to the opportunities in the recycling sector, as evidenced by the M&A overview in figure 11.

These acquisitions are primarily focused on realizing strategic synergies. However, there is also a unique opportunity for private equity (PE) investors to consolidate and/or employ a buy-and-build strategy. Several PE players have already expressed interest, with some actually competing in M&A processes with strategic investors. PE investors must buy, consolidate and industrialize now. After that, strategic investors will be willing to pay a high(er) price, implying an attractive exit price for PE.
## Figure 11: Major M&A activity in recycling

<table>
<thead>
<tr>
<th>Year</th>
<th>Target</th>
<th>Target location</th>
<th>Acquirer</th>
<th>Acquirer location</th>
<th>Deal description/Acquirer strategic rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>Kruschitz Gesellschaft</td>
<td>Austria</td>
<td>Steinbeis</td>
<td>Austria</td>
<td>Horizontal diversification of plastic division&lt;sup&gt;32&lt;/sup&gt;</td>
</tr>
<tr>
<td>2019</td>
<td>Societa Europea Rigenerazione</td>
<td>Italy</td>
<td>Sirmax</td>
<td>Italy</td>
<td>Horizontal diversification of plastic division&lt;sup&gt;33&lt;/sup&gt;</td>
</tr>
<tr>
<td>2018</td>
<td>Manuli Stretch</td>
<td>Italy</td>
<td>Oxy Capital</td>
<td>Portugal</td>
<td>Turnaround strategy&lt;sup&gt;34&lt;/sup&gt;</td>
</tr>
<tr>
<td>2018</td>
<td>Ecolast Kunststoff Recycling</td>
<td>Austria</td>
<td>Borealis</td>
<td>Austria</td>
<td>Horizontal diversification, part of circular strategy&lt;sup&gt;35&lt;/sup&gt;</td>
</tr>
<tr>
<td>2018</td>
<td>Plastic Recycling Zeit</td>
<td>Germany</td>
<td>Remondis SE &amp; Co</td>
<td>Germany</td>
<td>Geographical expansion&lt;sup&gt;36&lt;/sup&gt;</td>
</tr>
<tr>
<td>2018</td>
<td>Waste Paper Trade C.V.</td>
<td>Netherlands</td>
<td>Cycle Link International</td>
<td>China</td>
<td>Support transition from purchasing to trading organisation&lt;sup&gt;37&lt;/sup&gt;</td>
</tr>
<tr>
<td>2018</td>
<td>Lohner Kunststoffrecycling</td>
<td>Germany</td>
<td>Remondis SE</td>
<td>Germany</td>
<td>Horizontal diversification of plastic division&lt;sup&gt;38&lt;/sup&gt;</td>
</tr>
<tr>
<td>2018</td>
<td>MultiPet</td>
<td>Germany</td>
<td>Veolia Umweltservice</td>
<td>Germany</td>
<td>Complement existing business&lt;sup&gt;39&lt;/sup&gt;</td>
</tr>
<tr>
<td>2018</td>
<td>WIPAG</td>
<td>Germany</td>
<td>Albris</td>
<td>Germany</td>
<td>Horizontal diversification&lt;sup&gt;40&lt;/sup&gt;</td>
</tr>
<tr>
<td>2017</td>
<td>QCP</td>
<td>Netherlands</td>
<td>LyondellBasell / SUEZ</td>
<td>Netherlands</td>
<td>Horizontal diversification / vertical integration&lt;sup&gt;41&lt;/sup&gt;</td>
</tr>
<tr>
<td>2017</td>
<td>Van Scherpenzeel</td>
<td>Netherlands</td>
<td>Veolia Environnement</td>
<td>France</td>
<td>Further investment in waste chain&lt;sup&gt;42&lt;/sup&gt;</td>
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<tr>
<td>2017</td>
<td>Abakus Serve</td>
<td>Germany</td>
<td>Undisclosed</td>
<td>Germany</td>
<td>N/A&lt;sup&gt;43&lt;/sup&gt;</td>
</tr>
<tr>
<td>2017</td>
<td>MBA Polymers</td>
<td>China, Austria, UK</td>
<td>Elephant Equity</td>
<td>Germany</td>
<td>Buy-and-build&lt;sup&gt;44&lt;/sup&gt;</td>
</tr>
<tr>
<td>2017</td>
<td>KWP Recycling</td>
<td>Austria</td>
<td>Schonmackers Umweltdienste</td>
<td>Germany</td>
<td>Continue development in the long term&lt;sup&gt;45&lt;/sup&gt;</td>
</tr>
<tr>
<td>2017</td>
<td>Morssinkhof Rymoplast</td>
<td>Netherlands</td>
<td>Ikea</td>
<td>Netherlands</td>
<td>Vertical integration (minority stake)&lt;sup&gt;46&lt;/sup&gt;</td>
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<tr>
<td>2016</td>
<td>MTM plastics</td>
<td>Germany</td>
<td>Borealis</td>
<td>Austria</td>
<td>Horizontal diversification&lt;sup&gt;47&lt;/sup&gt;</td>
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<tr>
<td>2015</td>
<td>AKG Kunststoff Groep</td>
<td>Netherlands</td>
<td>Veolia Environment</td>
<td>France</td>
<td>Expansion of recycling capabilities&lt;sup&gt;48&lt;/sup&gt;</td>
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<tr>
<td>2014</td>
<td>Neo Eco Recycling</td>
<td>France</td>
<td>Baudelet Littoral</td>
<td>France</td>
<td>Expand offering (from collection to recycling) in the recycling space&lt;sup&gt;49&lt;/sup&gt;</td>
</tr>
<tr>
<td>2014</td>
<td>Houweling-Recycling Activities</td>
<td>Netherlands</td>
<td>SITA Nederland Holding</td>
<td>Netherlands</td>
<td>Expansion of recycling capabilities&lt;sup&gt;50&lt;/sup&gt;</td>
</tr>
<tr>
<td>2013</td>
<td>Prodhag Plastiques</td>
<td>France</td>
<td>Paprec Group</td>
<td>France</td>
<td>Geographical expansion&lt;sup&gt;51&lt;/sup&gt;</td>
</tr>
<tr>
<td>2012</td>
<td>Express Recycling &amp; Plastics</td>
<td>UK</td>
<td>Regain Polymers</td>
<td>UK</td>
<td>Expansion of recycling capabilities and geographical expansion&lt;sup&gt;52&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

**Note:** For transactions before 2017, only the largest have been selected.

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1. KPMG in the UK, “To ban or not to ban: The complex challenge posed by plastic and its alternatives”, June 2019. (https://home.kpmg/content/dam/kpmg/uk/pdf/2019/06/to-ban-or-not-to-ban-v6.pdf)


4. UN Ambassador Peter Thomson issues urgent call for action at Opening Oceans Conference, Nor-Shipping. (http://www.nor-shipping.com/call-for-action-at-opening-oceans-conference/)


9. More than only Polyethylene Terephthalate (PET) bottles, for which separate collection schemes exist in many countries.


11. KPMG proprietary analysis.

12. Figures include exported waste.

13. 2009-2018 pricing databases, Plastics Information Europe and Vraagenaanbod.nl


15. KPMG proprietary analysis.


18. Demand for recycled plastics divided by total plastic demand.


21. KPMG proprietary analysis.


24. 2009-2018 pricing databases, Plastics Information Europe and Vraagenaanbod.nl


26. KPMG analysis based on company websites and interview feedback.

27. Company websites, interview programs, Plastic Recyclers Europe data and Capital IQ data, KPMG estimate based on latest available company information.

28. Company websites, interview program, Plastic Recyclers Europe, Capital IQ, KPMG estimate based on an estimated market capacity of 5.5 Mt, which is based on an estimated market output volume of 4.7t in 2018 and a KPMG estimated average utilization rate of 85 percent based on market feedback.

29. Capital IQ.

30. 9 Steps of Plastic Recycling, Sinobaler Machinery. (http://www.sinobaler.com/9-steps-plastic-recycling/)


44. MBA Polymers Inc. has been taken over by Elephant Equity, MBA Polymers, 19 June 2017. (https://mbapolymers.com/news/takeover-by-elephant-equity/)


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