ENGLISH SUMMARY

CLIMATE DEAL TEXTILES ROTTERDAM

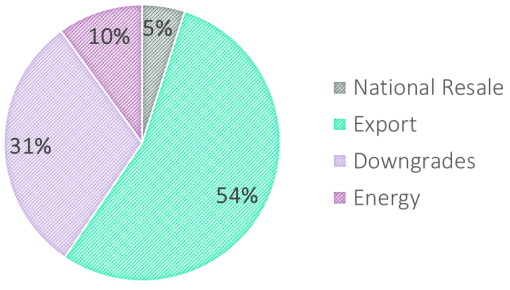
The 2015 Paris Agreement is a driving force for local and national governments to review and revise policies on reuse and recycling of textiles. And while the region of Rotterdam has high potential to become a circular textile hub, the first step has yet to be taken.

In September 2021, Eigendraads was commissioned by the City of Rotterdam to conduct a feasibility study on textile recycling as a first step towards the potential realisation of a circular textile hub in the region. With accurate data provided by sorters in the region Eigendraads was able to calculate current (2021) and projected (2030) volumes of feedstock availability and therefore define what considerations should be made in order to make a circular textile hub successful.

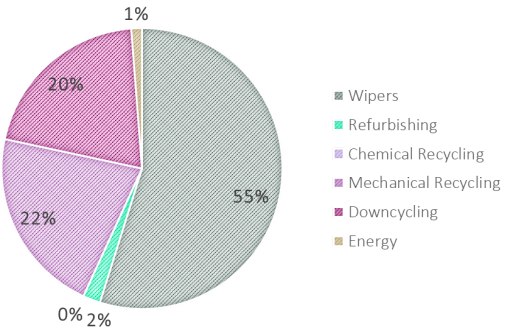
The current situation – The prominent Dutch post-consumer textile trade position

Despite the worldwide COVID restrictions in 2020 The Netherlands was still the world's 5th largest textile importer. While around 140,000 tonnes were imported, circa 185,000 tonnes were (re-)exported as second hand textiles and downgrades. For size reference, the total volume of collected post-consumer textiles generated by the population of The Netherlands in that same year was 126,000 tonnes. As the numbers above may give away, not all these textiles collected in The Netherlands are processed locally, over half (55%) of the Dutch post-consumer textiles are sorted abroad, while most of the Dutch sorters sort foreign (mostly German: 60%) textiles in return.

Over half of the Dutch sorters are located within the Province of South-Holland, close to Rotterdam. The four sorters that participated in this research together process around 92,000 tonnes per year. The business case of these sorters is made possible by the large portion of rewearable textiles (59%) they are able to reclaim from the mix. However, a significant volume of over 30% is classified as downgrades: textiles that are not suitable for rewear. Of these downgrades, 55% are used as wipers.



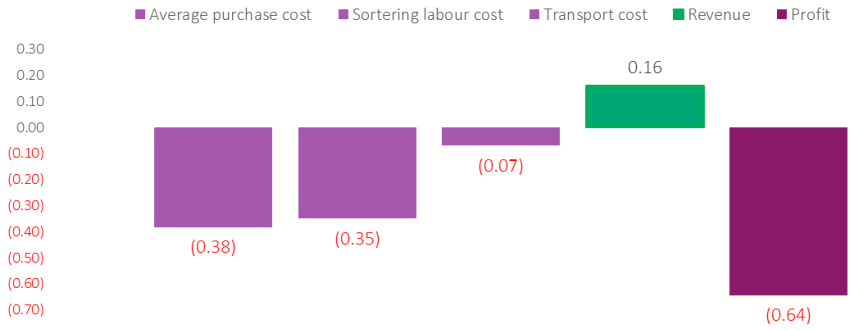
Breakdown of sorted textile destinations



Breakdown of downgrade destinations

These downgrades have a negative impact on a sorter's business case as it costs to sort these grades out, as illustrated in the figure below. The business case is being put under

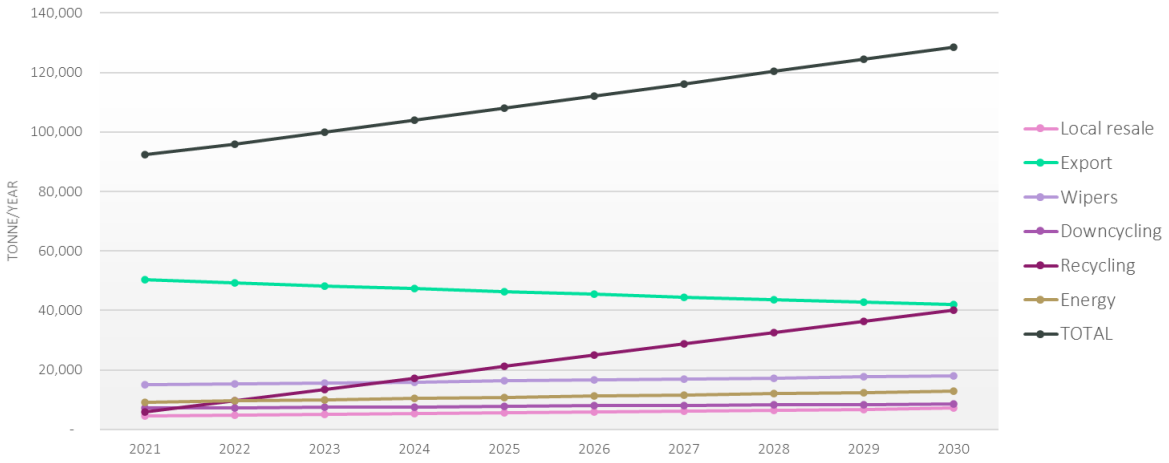
increased pressure these days due to the impact of fast fashion and the growing consumer awareness to put all textiles in the textile bin (and not only the rewearable ones), leading to an increase of loss making downgrades in the collected mix.



Cost per kilo of downgrades

Future volumes – Volumes projection which The Netherlands will have to process

45% of the post-consumer textiles generated by the population of The Netherlands is currently collected. The other 55% ends up in the general waste bin. However, it is the expectation that per year per capita 223 gram more post-consumer textiles will go to the textile bin, an increase of 4% per year. This is mainly driven by increasing consumer awareness. If we extrapolate this 223 gram per capita per year to 2030, the four sorters in the region will have to process c. 130,000 tonnes of which over 50% is classified as downgrades, of which at least 60% (or 40,000 tonne) will fall in the recycling bucket. These numbers assume that there is minimal movement in the current export, local resale and downcycling market due to saturation. A full list of assumptions can be found in the report (in Dutch).



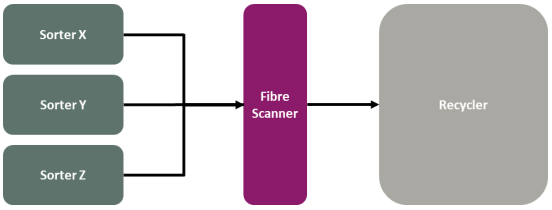
Volume growth per sorting grade

Business case – Making the supply chain circular

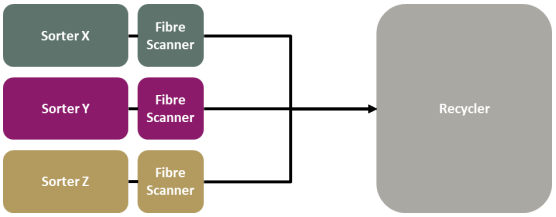
In order to anticipate this growing mountain of downgrades, focus should be put on preparing textiles for a new outlet: (chemical) recycling. To cater to this new way of material

recovery, the traditional sorting process will need to be supplemented with a fibre sorting step. It is crucial for a recycler that the feedstock that comes into their process is of high quality, e.g. the right fibre blend as a cotton recycler does not want feedstock that for instance contains 40% polyester.

This extra step in the sorting process can either be set up i) centralised: one big facility in the area or ii) decentralised: fibre sorting done in-house by each sorter individually.

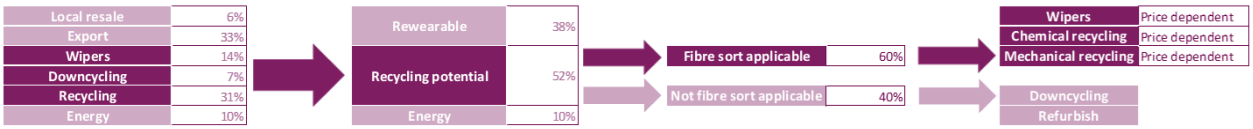


Centralised fibre sorting



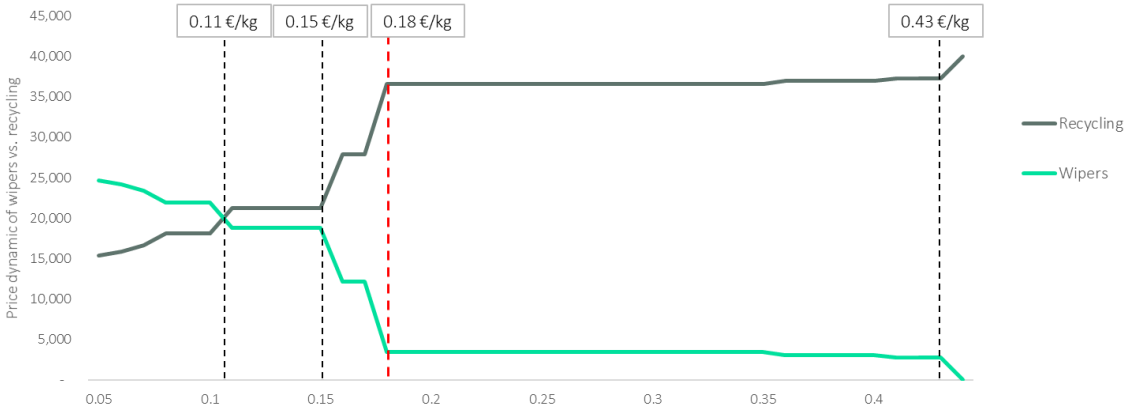
Decentralised fibre sorting

Not all textiles of the 51% downgrades will be suitable for fibre scanning, for example some garments will have multiple layers and therefore are only suitable for other applications such as downcycling. However 60% of the 66,000 tonnes of downgrades will be suitable for fibre sorting and can fall into three categories: wipers, mechanical recycling and chemical recycling.



Sorting potential of a fibre sorting machine with downgrades in 2030

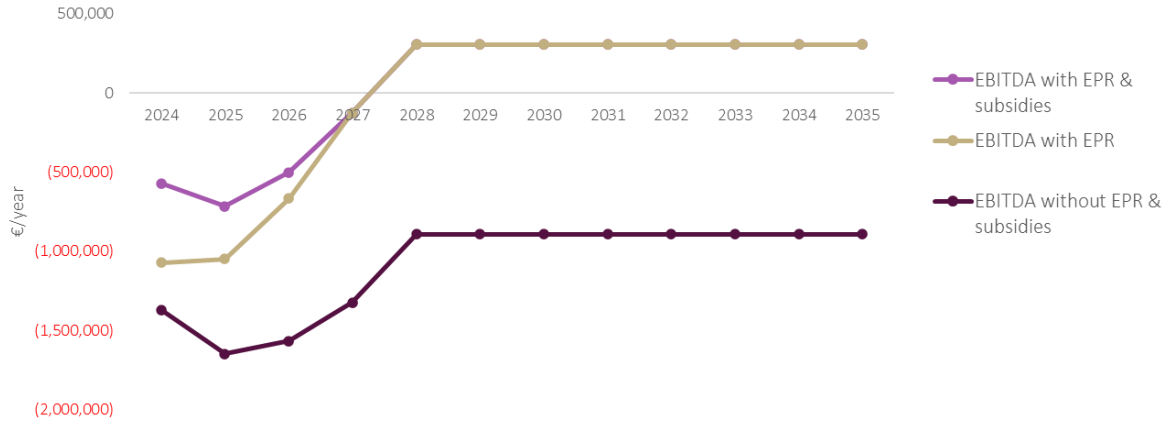
Market dynamics will dictate what the volume distribution between these 3 destinations will be. Under current market conditions a recycler will have to bid more than 18ct per kilo to outbid the wiper industry for the majority volume of sorted textiles.



Financial dynamics of wipers vs recycling

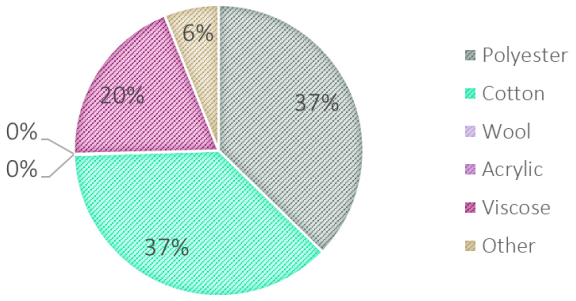
When modelling a 40,000 tonne fibre sorting facility, the capital investment is estimated at €2 million plus €600,000 start-up cost. Assuming the current average market price of 16ct/kg for downgrades and an output price of at least 18ct/kg meaning a reasonable €2ct/kg valoration (and 12.5% increase), the business would be losing money. Even with an

Extended Producer Responsibility (EPR) subsidy of 3ct/kg and a reasonable CAPEX subsidy of €500,000 in year 1, €333,000 in year 2 and €167,000 in year 3, the return of investment period will be 13 years.



EBITDA of fibre sort facility with and without financial support

When zooming in on the projected fibre composition of post-consumer downgrades in 2030, it is expected that it will not be the perfect feedstock for a recycler e.g. no big volumes of 100% polyester nor cotton shall be found. However, what will be present are blended textiles with high polyester or cotton content. It will be up to recyclers to ease their intake requirements on fibre purity. As this may lead to a negative impact on their business case, the Extended Producer Responsibility scheme should be prepared to support.



Expected fibre composition of regional feedstock for a chemical recycler in 2030

Workforce behind sorting – Securing continuity within industry

The four sorters in the region of Rotterdam together employ 421FTEs to sort 92,000 tonnes per year, or in other words per year one FTE on average sorts 221 tonne. Textile sorting is highly specialised as there are 400 sorting grades that are sorted in only 2 steps and it is all done manually. Partly due to shortage of staff it is more and more challenging to keep business local and to not let it disappear to the cheaper Eastern European countries.

In the projected situation where volumes of textiles will significantly increase, the sorter's business case will be put under pressure. As the additional collected textiles are likely to be a

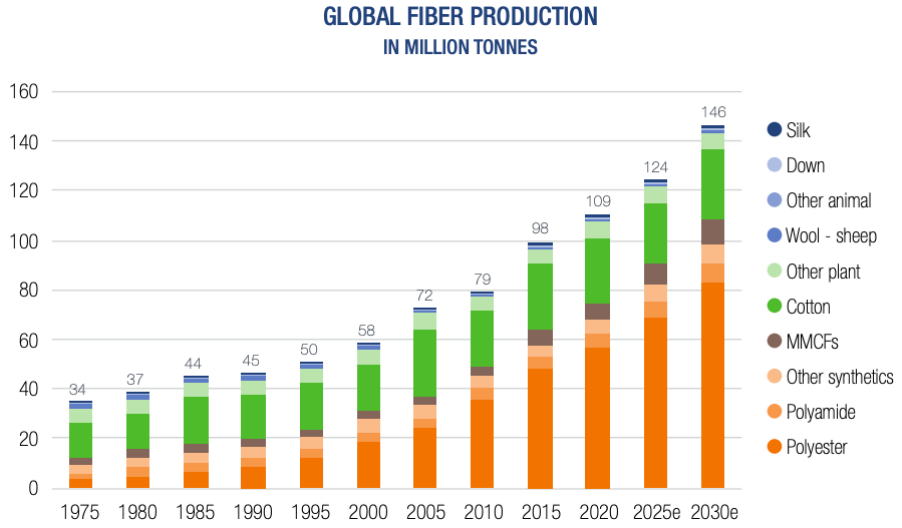
downgrade and while at the same time a sorter will have to employ more staff to process the volumes, the margins will be even more squeezed.

Assuming that the downgrade mix will grow from 31% in 2021 to 51% in 2030 and using the EPR calculations, the average value of textiles will be reduced by €13ct/kg. At the same time labour cost is expected to increase with €3ct/kg in 2030. Concluding that a sorter in 2030 on average is making €17ct/kg less than today, the negative business case without any aid will eventually lead to relocation or even bankruptcy. Hence the necessity to set up an ERP scheme where the sorter will be supported with at least 18-20ct/kg to cover the increased sorting cost as well as the automated sorting hub operations.

	2021	2030	Changes 2030 vs 2021
Value of sorted textile (averages)			
Price rewearable textile (per kilo)	€0.80	€0.80	
Price downgrades (per kilo)	€0.16	€0.16	
Share downgrades	31%	52%	21%
Average value per kilo	€0.52	€0.39	-€0.134
Labour cost sorting			
Labour cost per hour	€36.80	€40.48	€3.68
Labour cost per kilo	€0.35	€0.38	€0.03
Net impact downgrades and labour cost per kilo			**-€0.169**

Our place in the world – looking at the bigger picture

The value of downgrades is dependent on the composition of the fibres of which the post-consumer products are made. In the last 10 years this composition has changed rapidly. While in 2000 less then 20 million tonne polyester was produced, this number has quadrupled to over 80 million tonne in 2030. In 2020, 52% of the world fibre production was polyester. Even though this is not a representative image for The Dutch textiles market (mainly because as a relatively wealthy nation the focus is more on luxury fibres such as



cotton and wool) it is expected that also in the Netherlands we will see more polyester in our post-consumer textiles.

The Dutch government has set the bar high in terms of fibre-to-fibre recycling targets: by 2030 50% of the textiles put on the Dutch market should be recycled, of which 33% fibre-to-fibre. This means that of the 315,000 tonne consumer textile that is brought to The Netherlands, at least 52,000 tonne should be fibre-to-fibre recycled. At this point in time a whopping 0.5% or 545,000 tonne of the world fibre production is fibre-to-fibre recycled. The target's set by the Dutch Government would mean that it would be able to absorb almost 10% of the world's fibre-to-fibre recycled textiles today.

What is next – Recommendation on how to move forward

In 2019, Rotterdam together with 100 local businesses launched the Rotterdam Climate Agreement with the aim to realise the climate targets set by the city. The participating parties were divided by industry, where each industry has its own 'Climate Table'. It is up to these Climate Tables to set targets and write out Climate Deals.

It is a given that the realisation of these targets take time and effort. Investments in an infrastructure that runs on small margins, which is surrounded by major uncertainties should not be carried by the private sector alone. Private and public stakeholders have therefore joined forces under the Climate Deal Textiles, part of the Climate Table on Consumption.

In the Climate Deal Textiles, the participating stakeholders will work in a pre-competitive setting supported by Eigendraads as initiator and process director. A competition clause is in force to protect all parties involved. Currently this consortium consists of textile sorters in the region, the City of Rotterdam, the Province of South-Holland, the Port of Rotterdam, and chemical Recyclers. Other stakeholders such as knowledge institutes or textile collectors without sorting activities can contribute in kind via for instance meetings and interviews.

The publication of this feasibility study marks the first step towards the realisation of a circular textile hub in the region of Rotterdam. In the first half of 2022 Eigendraads will continue to collaborate with the key stakeholders in the region to sign a collaboration agreement and generate a detailed execution and funding plan for the realisation of the hub. In the meantime Eigendraads will also focus on positioning the region as a circular hub.

Our partners: during this study we collaborated with sorters and collectors in the region. We also worked in parallel with environmental consultant CE Delft to map out the environmental impact of a circular textile economy in the region.

About Eigendraads: we are an initiative, based in Rotterdam, the Netherlands, and specialised in end of use textiles. Eigendraads works with governments, businesses and initiatives along the value chain, mainly on the post-consumer textiles to help valorise them. Want to know more? Contact us: hilde@eigendraads.com