Monitor Denim Deal

Overall results of quantitative and qualitative monitoring 2020-2023

Final report

May 21, 2024

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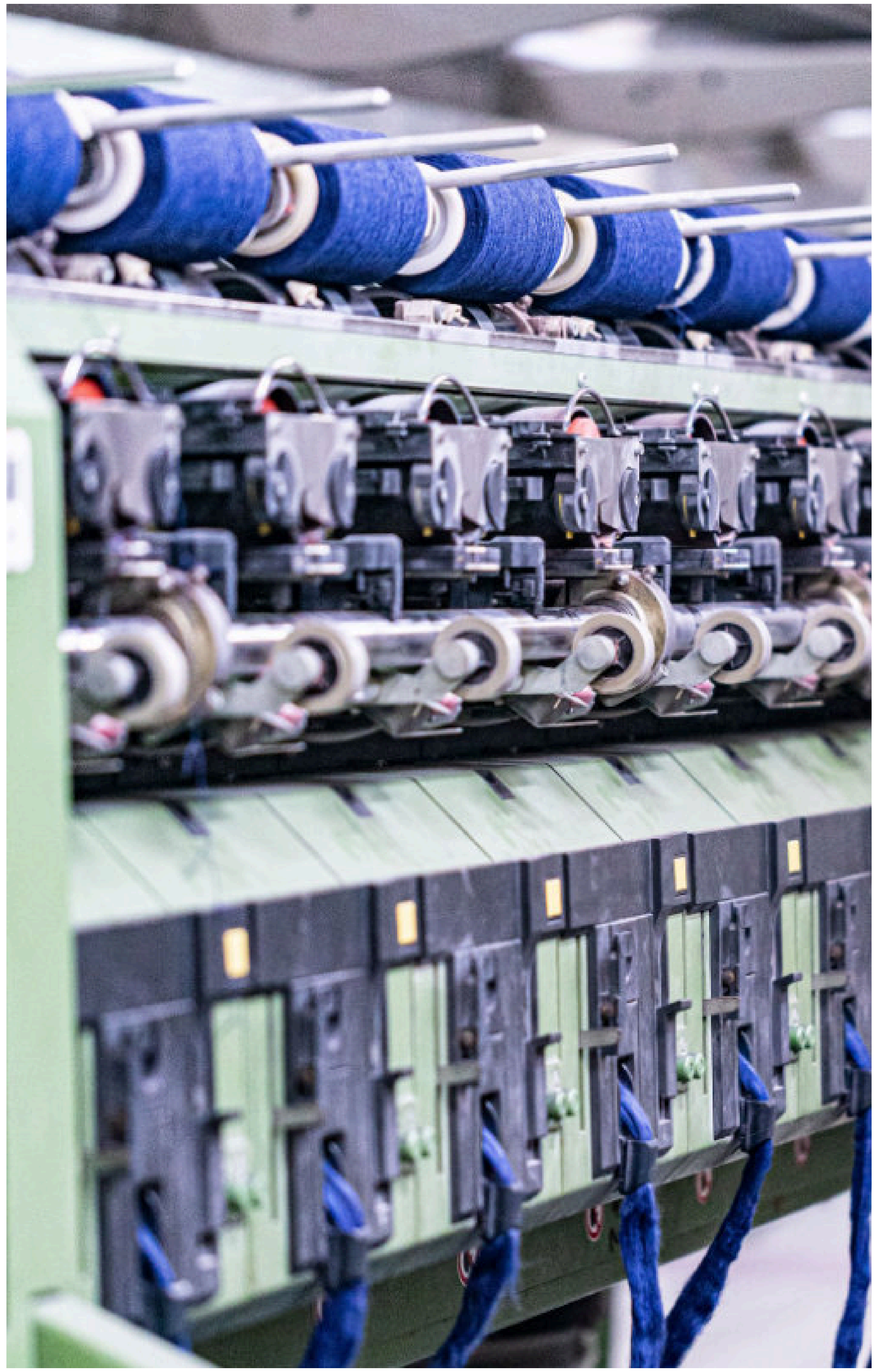

Introduction

On 29 October 2020, 28 parties signed the Dutch C-233 Green Deal on Circular Denim ('Denim Deal'). Signatories in the value chain, from producers, brands and retailers to collectors, recyclers and public authorities, have jointly developed an approach to take major steps towards using recycled textile in all denim products marketed in the Netherlands. On 1 January 2024, when the Denim Deal ended, a total of 53 signatories, including 7 brands and retailers (8 up to 2022), were committed to the Denim Deal.

This final monitor report about the Denim Deal provides a general summary of all results and challenges from 2020 up to 2023. It is based on the outcome of a quantitative monitoring of all participating brands and retailers and a qualitative monitoring completed by about two-thirds of all signatories to the Denim Deal. In 2023, lessons learned from the 2020-2023 Denim Deal were compiled and published in a booklet. The technical issues and challenges identified during the Denim Deal regarding the application of post-consumer recycled cotton (hereinafter to be referred to as POCR cotton) were described in the Technical Report for the Denim Deal. Both reports are published on www.denim-deal.nl.

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Summary

Quantitative results

The quantitative monitor for 2023 shows a clear positive trend regarding the increase in the use of POCR cotton in denim garments and jeans between 2020 and 2023. In general, most participating brands and retailers are aiming for higher goals in the coming years than the 5% POCR goal for all denim garments in the Denim Deal at the end of 2023.

Goal 1 Brands and retailers will achieve a **minimum of 5% POCR cotton** in their own denim collections by working together closely with other signatories.	In 2023, 62% of all denim garments put on the Dutch market by the participating brands and retailers contained at least 5% POCR. This is a substantial increase in comparison with 2020, when it was 8%. And the volume of denim garments produced by the participants worldwide containing at least 5% POCR cotton has increased from 12% in 2021 to 63% in 2023.
Goal 2 Brands and retailers will achieve their own, individual and **higher goals for POCR content** in denim garments and will set out their ambitions and approach in individual roadmaps, in close collaboration with other signatories.	Most (4 of 7) brands and retailers even aim for a higher percentage of POCR content in denim garments. The individual goals specified in the last two years are far lower but more realistic than in 2020 and 2021. Brands indicated that the transition takes time.
Goal 3 Brands and retailers will commit to individual ambitions designed to achieve the specific, joint goal of using **20% POCR cotton fibres in 3 million pairs of jeans** produced by these parties until the end of 2023.	On the global market, the goal of 3 million pairs of jeans with 20% POCR content was already reached in 2021, and this number more than tripled in 2023. However, it was not possible to reach the goal of 3 million pairs of jeans with 20% POCR cotton on the Dutch market only, due to the limited number of brands that signed the Denim Deal. Nearly all jeans of the participating brands would have had to contain 20% POCR cotton for this target to have been achieved during 2021-2023. In 2023 the volume of jeans put on the Dutch market by the participants with 20% POCR cotton increased from 8% in 2020 to 61% in 2023. 63% of the volume of jeans globally produced by participants in 2023 contained at least 20% POCR cotton. This is also a substantial increase compared to 2020. In 2020, 13% of the volume produced by participants contained 20% POCR cotton. The Denim Deal has shown that jeans can easily contain 5% POCR, including those from non-participants in the Denim Deal.

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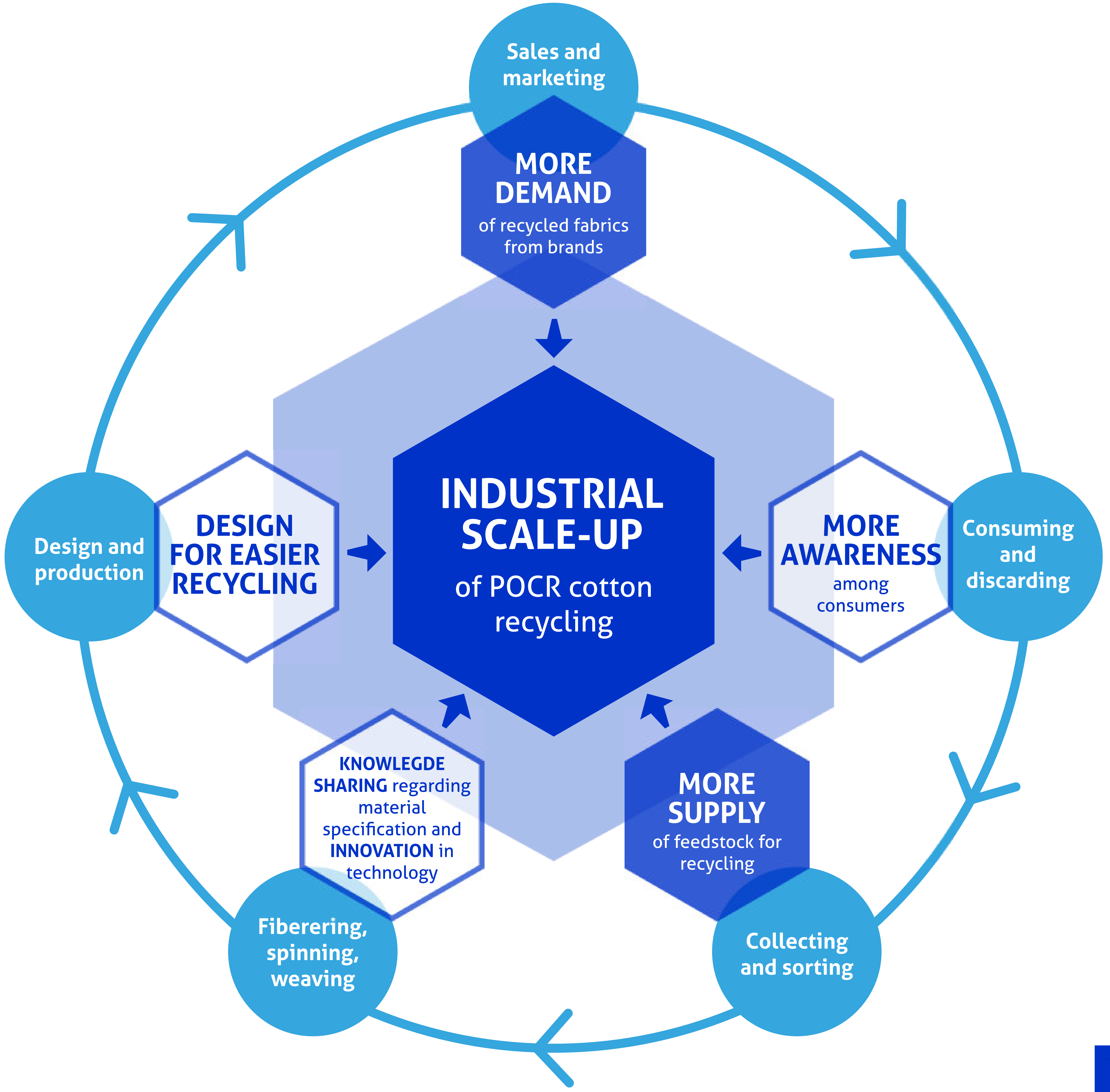
Summary

Qualitative monitoring

The objectives of the Denim Deal focused on the increase in the use of POCR cotton. In 2021-2023, brands and manufacturers carried out various pilot programmes with fabrics containing POCR cotton to gain more experience with post-consumer material. The efforts involved in the switch between the current denim qualities to POCR cotton versions have been a massive undertaking, and this is a journey where we have not yet reached the destination.

Now that we are on our way, we are noticing that there are challenges emerging from various types of organisations or companies in different countries, and opinions sometimes differ. This monitor reflects the different opinions, while also showing that all participants agree that an industrial scale-up of the post-consumer cotton recycling industry is required. Participants identified five interdepending challenges regarding the transition towards an industrial scale-up.



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According to the respondents, the international market requires a European and global approach to the denim industry. If we want to scale up the application of POCR content and make its production profitable, **more demand for this raw material must arise from the brands** and especially in their production countries such as Turkey and countries in Asia. Only then will there be the **industrial scale-up that is necessary to produce raw material with the same quality and the same price as virgin material**. To incentivise increased use of POCR cotton, brands should actively support and purchase recycled fabrics from mills, thereby demonstrating commitment and driving market change.

Furthermore, it is necessary to encourage Dutch sorters to invest in sorting for recycling so that more POCR cotton from the Dutch market can be supplied to fiberisers and spinners to produce yarns and fabrics with POCR content. The **implementation of extended producer responsibility**, whereby producers must achieve EPR goals in the field of fibre-to-fibre recycling, will contribute to this.

Certain **barriers** between the Netherlands and production countries still form an issue in achieving an industrial scale-up. In this context, rules applied by customs in Turkey and various Asian countries **obstruct exports from** the Netherlands. Dutch sorted material prepared for fiberisation and/or fiberised material for spinning needs to be exported to production countries. Connecting sorters directly to the international production market is essential for scale-up in the production of fabrics with POCR content.

It appears from the monitor that some participants **are concerned about the current revisions of the Waste Shipment Regulation**, affecting the options to export waste outside OECD countries. In order to stimulate the recycling of POCR textiles, they emphasise that is important to develop robust End-of-Waste criteria, so that non-reusable post-consumer textiles commonly used for recycling purposes are classified as a resource rather than waste and could be exported outside OECD countries. The textile production supply chain is a global process, and restricting the export of ready-to-recycle raw textiles from the EU could result in significant quantities of post-consumer textiles being diverted to incineration instead of contributing to the circular economy in the form of new yarns.

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Summary

Participants also mentioned that **European product legislation** will be required in order to stimulate demand for the use of POCR cotton in denim. If producers are required to use POCR content under new European legislation (e.g. Ecodesign for Sustainable Product Regulation), demand from brands will increase and new business models will emerge for sorting companies, fiberisers and spinners.

It is important to bring together demand from fiberisers for well-sorted material for recycling and supply from Dutch sorters. That said, **the market is not yet mature and pilots** usually still depend on individual contacts.

This also applies to brands. The participating brands of the Denim Deal are frontrunners, but they indicate that purchasing yarns with POCR content is a new activity and supply and demand still have to come together.

At the start of the Denim Deal, participants indicated that achieving the same strength and durability with post-consumer recycled cotton as with pre-consumer recycled cotton, or virgin cotton, is a considerable challenge. In this respect, some brands, spinners and weavers indicated that innovations should focus on improving manufacturing processes because recycled content with more than 20% POCR cotton currently results in less strength, which makes it more difficult to run denim processes such as dyeing, weaving and finishing. Trying to increase the amount of POCR cotton while preserving strength is difficult. However, some brands and spinners indicated that **significant technical progress has been achieved in recent years** (2022-2023) by fiberisers, spinners and weavers so as to improve the **quality of fabrics** with POCR content. The use of 20% POCR in the cotton blend currently offers the same physical quality metrics as 100% virgin cotton. This was demonstrated during the two quality workshops organised within the context of the Denim Deal with technical data sheets that were shown to the audience.

It is necessary to build up **knowledge** and expertise among **producers** with regard to the difference between post-consumer recycled content and pre-consumer recycled content.

Summary

Furthermore, alternative options in the recycling process of Denim to ensure sustainability - such as water use, pesticide use and/or other combinations of materials (e.g. Lycra/Tencell) - should be kept in mind.

It is important that brands be transparent about the origin and composition of their products. However, completely accurate traceability of the origins of the materials is not yet guaranteed. To achieve this, **more transparency between supply chain partners** regarding fabric quality data and fabric origins (Chain of Custody) will be required to trace the source of POCR content in the yarn.

The quantitative monitor is based on a self-reporting methodology of brands. The **next step** for the **monitoring** would ideally be the development of a **validation method** for the data from brands based on the Chain of Custody concept.

Finally, the Denim Deal has connected stakeholders in the supply chain and has highlighted the difficulties involved in the use of POCR cotton in new denim across the value chain. The **monitor reports show that collaboration between all the different parties in the supply chain** is required to break the current waiting game between the parties in the supply chain. The Dutch Denim Deal has made an **important step in demonstrating that it is indeed possible to work with POCR cotton**. In order to make a true impact, this initiative needs to expand and create change across multiple regions and at a global scale. However, since an industrial scale-up requires more demand for POCR from brands, it is essential to **connect a critical mass of large denim producers**.

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Monitor Denim Deal

Overall results of quantitative and qualitative monitoring 2020-2023

Introduction

The signatories to the Denim Deal aimed to close the denim loop by promoting the use of **post-consumer recycled cotton** fibres (hereinafter to be referred to as **POCR cotton**) in new jeans and other denim garments. They committed themselves to the joint ambition of working as quickly as possible towards a new industry standard of 5% POCR cotton used in the production of all denim garments and will raise the bar in the future, based on the lessons learnt from the Denim Deal. They annually monitored the activities undertaken to this end, the results achieved and their effect, and they identified challenges in achieving the goals of the Denim Deal.

This report provides a general summary of all results and challenges from the Denim Deal period from 2020 up to 2023. It is based on the outcome of the quantitative monitoring of all participating brands and retailers and the qualitative monitoring conducted on the basis of 65% response among signatories to the Denim Deal. Furthermore, we asked participants to review the qualitative results published in 2023 and give an update with respect to their challenges or innovation projects. Additionally, with respect to 2023, we have consulted with spinners and weavers for a brief assessment of the share of POCR content in yarns and fabrics produced by Denim Deal parties. Thanks to the final input of the participants, this report provides the most up-to-date picture of the results of the Denim Deal.

This monitor shows that increasing the use of POCR content in denim is a journey where we have not yet reached the destination. Now that we are on our way, we are noticing that there are challenges emerging from various types of organisations with a different role in the supply chain in different countries, and therefore opinions sometimes differ. This report reflects these different opinions, while also highlighting the need for genuine collaboration in the supply chain to advance towards greater adoption of POCR content.

In this report, all participating signatories are referred to as ‘participants’ (of the monitoring).

Goals Denim Deal

All signatories to the Denim Deal have undertaken activities to achieve the following specific goals before the end of the Denim Deal in December 2023.

1	Brands and retailers will achieve a minimum of 5% POCR cotton in their own denim collections during this period by working together closely with other signatories.	
2	Brands and retailers will achieve their own, individual and higher goals for POCR cotton in denim garments and will set out their ambitions and approach in individual roadmaps, in collaboration with other signatories.	
3	Brands and retailers will commit to individual ambitions designed to achieve the specific, joint goal of using 20% POCR cotton fibres in 3 million pairs of jeans produced by these parties until the end of 2023.	

Definitions

The following definitions apply in the context of the monitoring:

Denim is a cotton twill fabric, traditionally made from 100% cotton, but alternative fibres have recently been added such as hemp, linen and elastane. The product must contain at least 80% cotton. Denim is traditionally blue by using indigo dye to colour the yarn in one direction. In practice, denim can have different colours and does not necessarily have to be indigo blue.

Denim garments are outer clothing made of denim (e.g. pants, dresses, skirts, jackets, shorts, shirts and so on), except accessories (caps, bags, et cetera), which, for the purposes of the Denim Deal, does not include trimming.

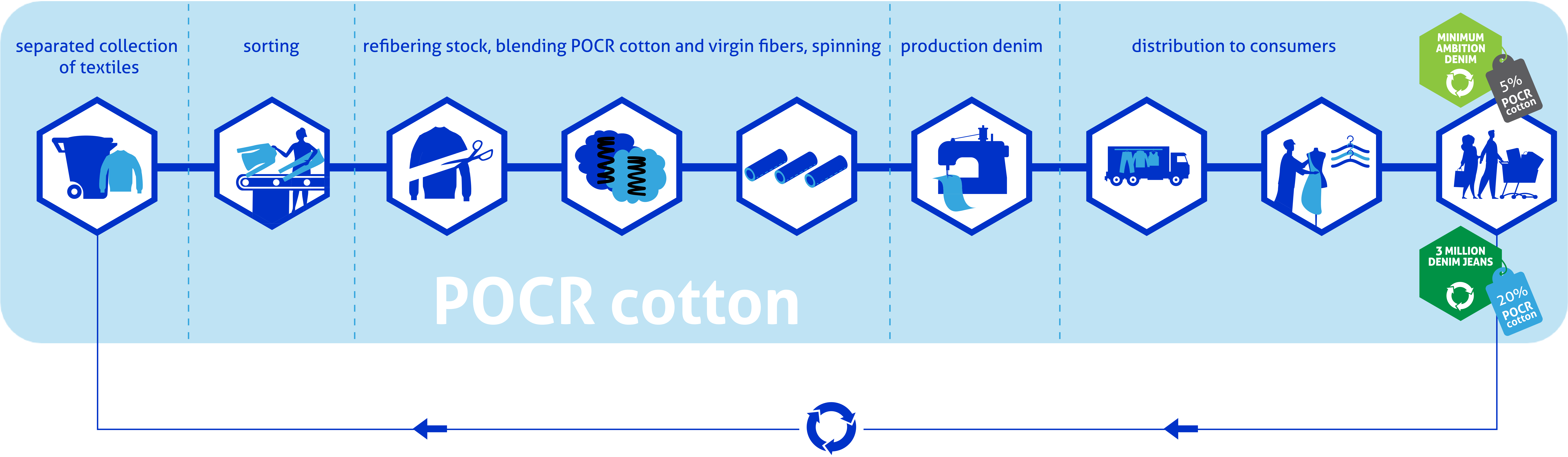
Jeans are hard-wearing trousers made of denim.

Post-consumer recycled cotton (POCR cotton) is recycled cotton from textile products used by the end user(s) for an indefinite period of time for the intended purpose, after which they are discarded and subsequently recycled, where the cotton fibres of at least 98% cotton are reused in new products.

The data have been compiled by FFact. The annual monitoring has been carried out for the years 2020-2023. This is the final monitoring report containing all results. The information in the report is anonymised and aggregated. The monitor is based on a self-reporting methodology for a given reference date with the aim of identifying possible trends in the reported data. The results presented therefore reflect the current state of affairs on the reference date. Subsequently added changes or differences to the exact figures may therefore occur.

The road to goals for **denim garments and jeans**

The figure below shows the supply chain of post-consumer recycled cotton.



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Monitoring approach

The quantitative data in this report apply to the input of all 7 participating brands and retailers and not to the total market. In order to collect quantitative data for 2023, the participating brands received a standard monitoring form to submit their data.

One of the 8 brands in 2022 was unable to provide data over 2022 due to circumstances. As for the figures over 2022, it has been assumed that the 2022 data of this company were similar to 2021. This brand formally no longer participated from 2023 onwards. The results of 2023 are therefore based on the data of 7 brands.

The aim of the qualitative monitoring is allowing the signatories to the Denim Deal to share experiences, to see which activities and efforts contribute to the Denim Deal, and to identify challenges they experience while working on achieving the goals. For the monitoring over 2023, the qualitative survey was not repeated because it was already a very extensive process in 2022 and the 2020-2023 Denim Deal was nearing its end. However, we have asked the participants to review the last qualitative results published in 2023 and add possible new challenges and projects. In addition, in 2024, we asked the spinners and weavers questions about their share of POCR content in yarns and fabrics in 2023. With the new input from the participants incorporated, this report is an up-to-date representation of current figures and challenges.

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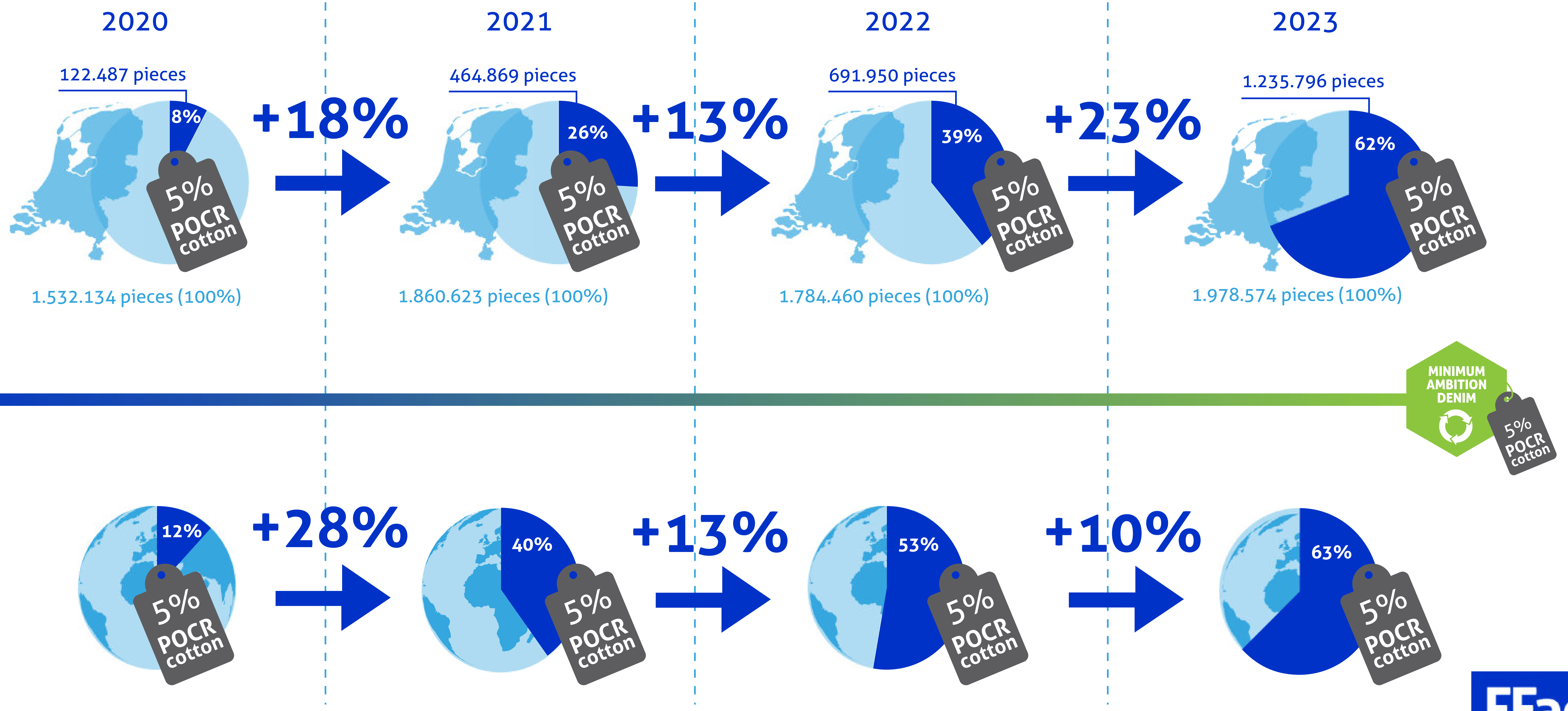
Results of quantitative monitoring 2023

Monitoring results 2023 for **denim garments**

The figures below refer to the questions in the 2020, 2021, 2022 and 2023 monitoring forms. The figures refer to the share of denim garments including jeans with post-consumer recycled cotton.

The number of denim garments put on the Dutch market and the share that complies to the ambition of a minimum of 5% POCR cotton by the brands and retailers of the Denim Deal.

The share of denim garments produced by the brands and retailers of the Denim Deal globally that complies to the ambition of a minimum of 5% POCR cotton.



Additional individual goals for **denim garments**

At the start of the Denim Deal, participants set individual goals between 25% and 100%. From 2022 onwards, these goals became more realistic, varying between 10% and 40%. One of the participants explained that goals are set for the entire portfolio of the brand (more than denim only) and are set for pre-consumer and post-consumer recycled textiles combined. Their goal for the mix (pre-consumer and post-consumer recycled textiles) is 25%. Two frontrunners are still working on making jeans using recycled cotton only. Mud Jeans launched the ‘Road to 100 pilot’ in 2022 and successfully introduced a pair of jeans made entirely from recycled cotton. Mud Jeans is sticking to this goal, focusing on finding innovative ways to make denim more sustainable, consistently looking for new innovations.

In 2024, Kuyichi launched its first 100% POCR denim style, the Scott Old Fashioned Blue (see photograph). In addition to these special pilots, the brands have focused on increasing their use of POCR cotton in the rest of their collection. The monitoring shows that from 2021 until 2023, brands and manufacturers conducted various pilots with fabrics containing POCR cotton to gain more experience with post-consumer material. They indicated that the efforts involved in the switch between current denim qualities to POCR cotton versions have been a massive undertaking.

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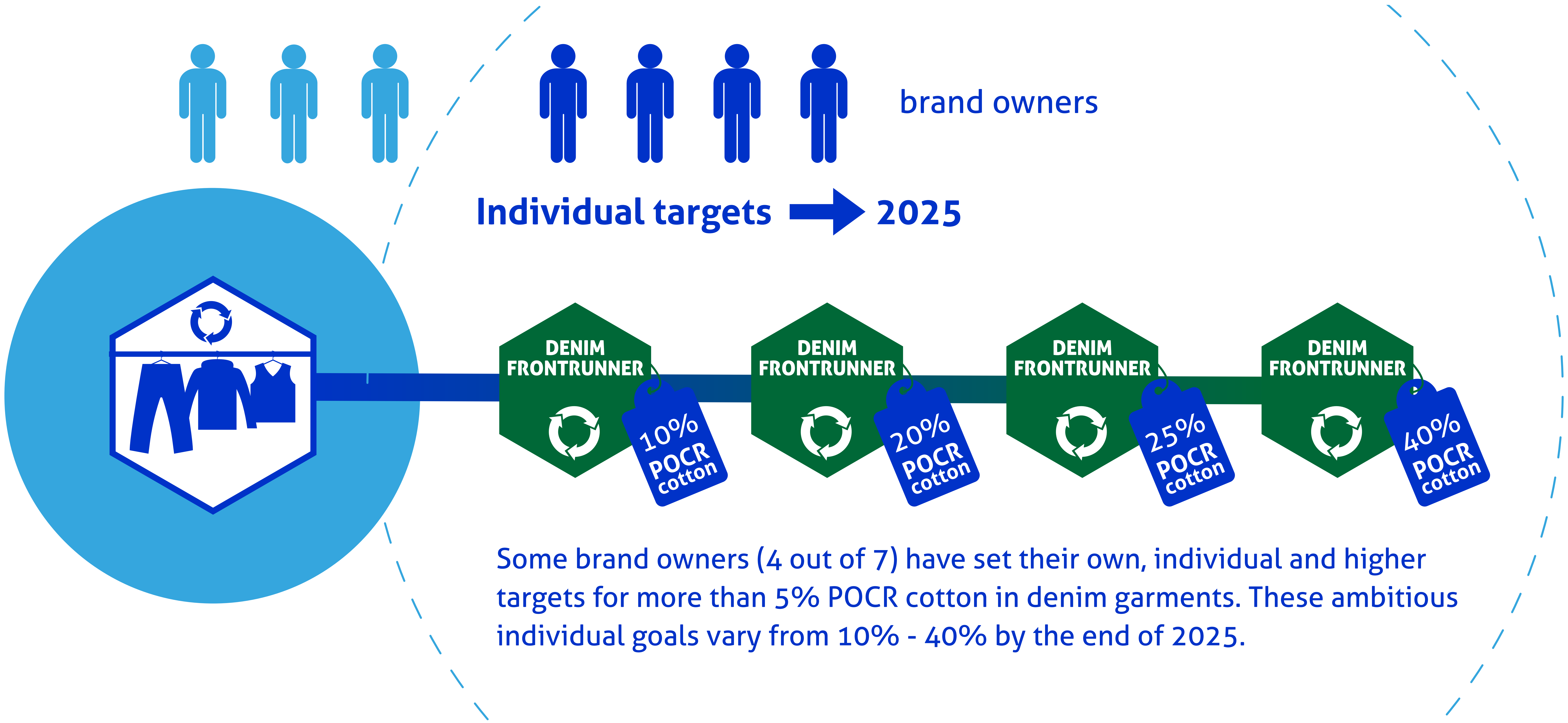
Additional individual goals for **denim garments**

At the start of the Denim Deal, participants aimed for higher individual goals between 25% and 100%. From 2022 onwards these became more realistic and varied between 10% and 40%. One of the participants explained that goals are set on the full material portfolio (more than denim only) and are set for 25% pre and post consumer recycled cotton together.



Some brand owners (4 out of 7) have set their own, individual and higher targets for more than 5% POCR cotton in denim garments. These ambitious individual goals vary from 10% - 40% by the end of 2025.

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A clear positive trend for POCR cotton in denim garments

The application rate of POCR cotton in denim garments and jeans in the period between 2020-2023 shows a clear positive development. In general, most participating brands and retailers are aiming for higher goals than the 5% POCR content in the coming years.

The results for 2023 show that 62% of the volume of denim put on the Dutch market by participants contains at least 5% POCR cotton. Compared with 2020 (8%), this is a substantial increase. And the volume of denim garments produced by the participants worldwide containing at least 5% POCR cotton has increased from 12% in 2021 to 63% in 2023.

Most brands and retailers (4 of 7) have set their own goals for POCR cotton in denim garments, which are **more ambitious** than the intended new industry standard of 5%. Their individual goals vary from 10% up to 40% by the end of 2025. However, the individual goals specified for 2023 and 2022 are far lower and more realistic than during the first monitoring years 2020 and 2021.

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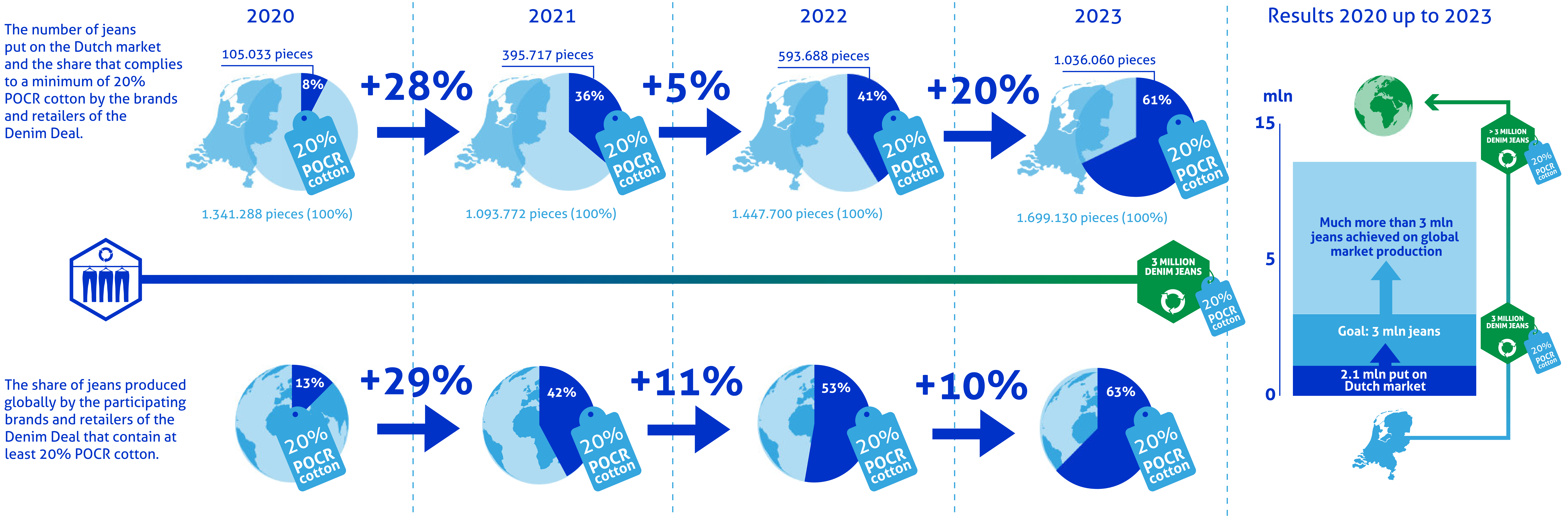
Monitoring results 2023 for **jeans**

The figures below refer to the questions in the 2020, 2021, 2022 and 2023 monitoring forms.
The figures refer to the share of jeans with post-consumer recycled cotton.



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A growing share of 20% POCR cotton in jeans

Between 2020 and 2023, the participating brands and retailers put a total of 2.1 million jeans on the Dutch market containing at least 20% POCR cotton. In 2023, 1 million jeans (61%) of the total volume put on the Dutch market by participants contained at least 20% POCR cotton. The volume of jeans put **on the Dutch market by the participants with 20% POCR cotton increased** from 8% in 2020 to 61% in 2023.

The results for 2023 show that 63% of the volume of jeans produced worldwide by participants contained at least 20% POCR cotton. This is a substantial increase compared to 2020, when only 13% of the volume globally produced by participants contained 20% POCR cotton.

On the global market, the goal of 3 million pairs of jeans with 20% POCR cotton was already reached in 2021. By the end of 2023, this number had more than tripled. However, it was not possible to reach the goal of 3 million pairs of jeans with 20% POCR cotton on the Dutch market only. Nearly all jeans of the participating brands would have had to contain 20% POCR cotton for this target to have been achieved during 2021-2023.

Results qualitative monitoring

Developments and challenges,
a qualitative picture
behind the figures

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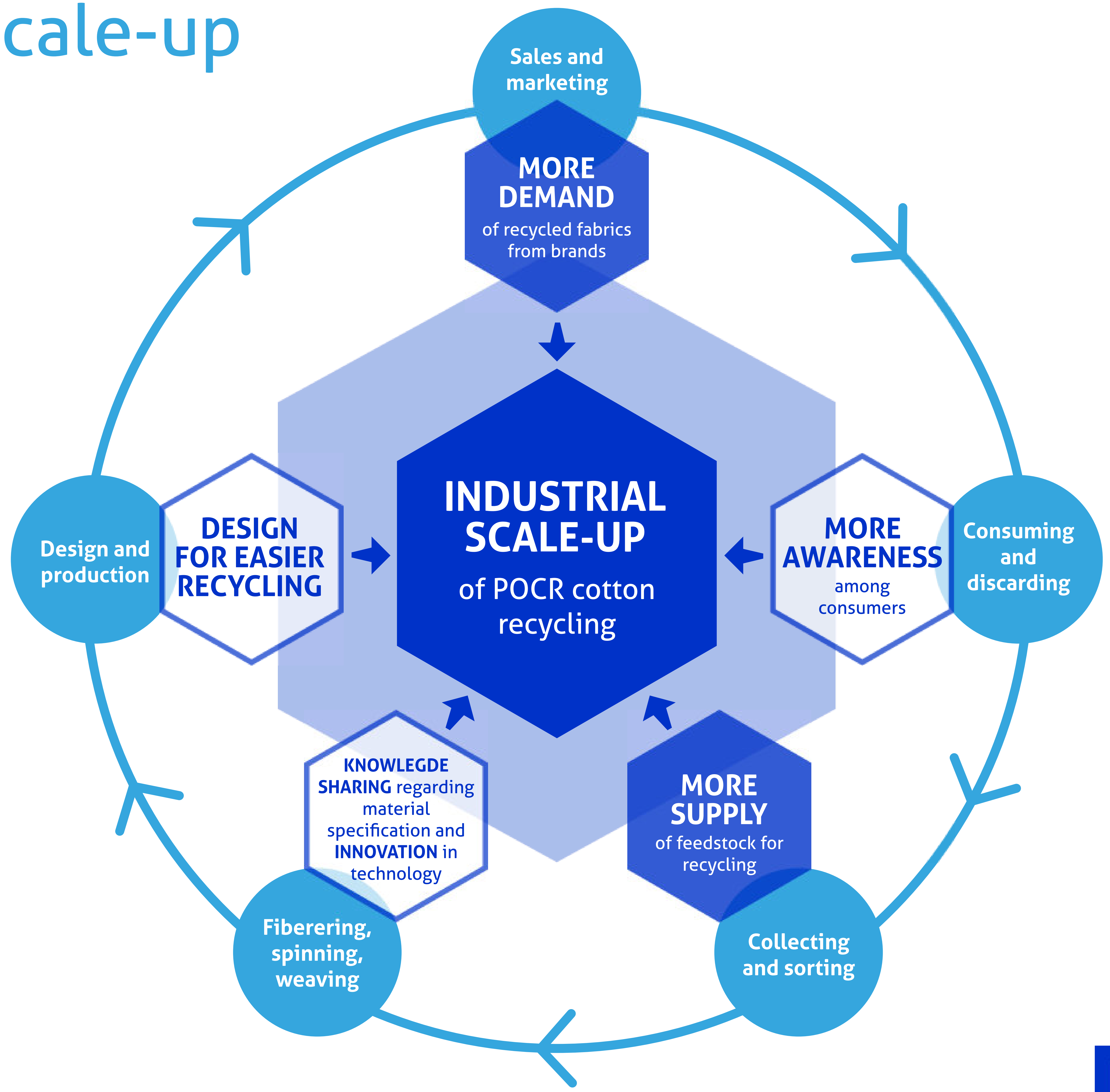
Challenges of the industrial scale-up

The qualitative monitoring asks the participants about their activities, results and challenges within the Denim Deal, in the context of improving the use of POCR cotton in new denim garments.

The qualitative monitoring showed that an industrial scale-up of post-consumer recycling for new denim garments is necessary. Participants were asked what it takes to create an industrial scale-up. The five key challenges mentioned by the participants are included in the following diagram.



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Challenges of the industrial scale-up

We have identified five interdepending challenges regarding the transition towards an industrial scale-up of the post-consumer cotton recycling industry. The qualitative monitoring shows two main challenges and three other related challenges.

All of the challenges of the industrial scale-up are strongly interdependent, according to the participants. More awareness among consumers will have a pull on brand demand for POCR cotton; this will accelerate investments in innovation in recycling technologies and capacity; feedstock from sorting will become more valuable and the business case for sorted materials will improve.

These main challenges and their interdependence were also described in the MIS analysis by Utrecht University (Hekkert et al, 2021): ‘Transition to Circular Textiles in the Netherlands’. This innovation systems analysis of textile recycling refers to the above-mentioned challenges as a ‘waiting game’ or ‘chicken-and-egg’ problem. This implies that the industry is reluctant to design clothes with recycled fibres and that the industry will produce garments with recycled cotton on a large scale only if volume, quality and price are favourable. At the same time, not enough POCR feedstock is available. Our qualitative monitoring indicates a similar situation.

The hypothesis in the monitor on 2022 was that a breakthrough is possible by: 1) creating more demand for recycled fabrics and 2) creating more supply of POCR cotton feedstock. According to the participants, these two challenges are still topics in 2024 that need to be resolved and which were not properly addressed or tackled during the timeframe of the Denim Deal.

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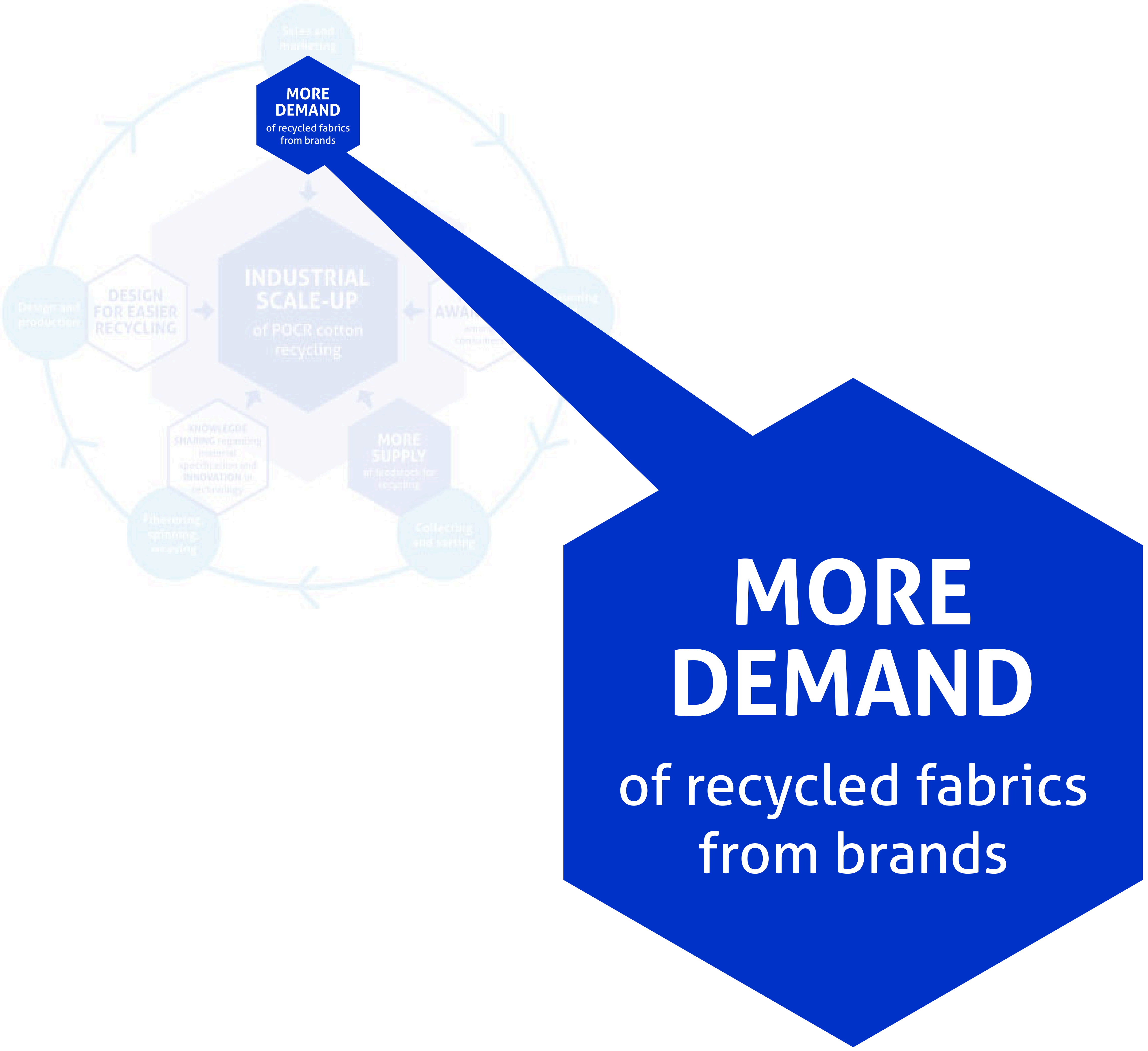
Challenge 1: more demand for recycled fabrics from brands



Most participants indicate that there is a need for more demand for recycled fabrics from brands. At this point, textiles made of raw (virgin) materials are still dominating the market. We see that, in the case of using recycled materials in yarns, the share of pre-consumer recycled content made of cutting waste (also known as post-industrial waste) is significantly larger than the share of POCR material. The monitoring shows that the Denim Deal activated the industry, and that large brands that do not participate in the Denim Deal also buy fabrics with recycled content from fabric suppliers participating in the Denim Deal.

Some participants explained that brands could resolve this shortage in demand by stepping up marketing efforts for fashion with recycled content. This would give fabrics with POCR cotton a more positive image. While doing so, according to some participants, the brands should be more transparent about the origin and composition of their products.

Challenge 1: more demand for recycled fabrics from brands

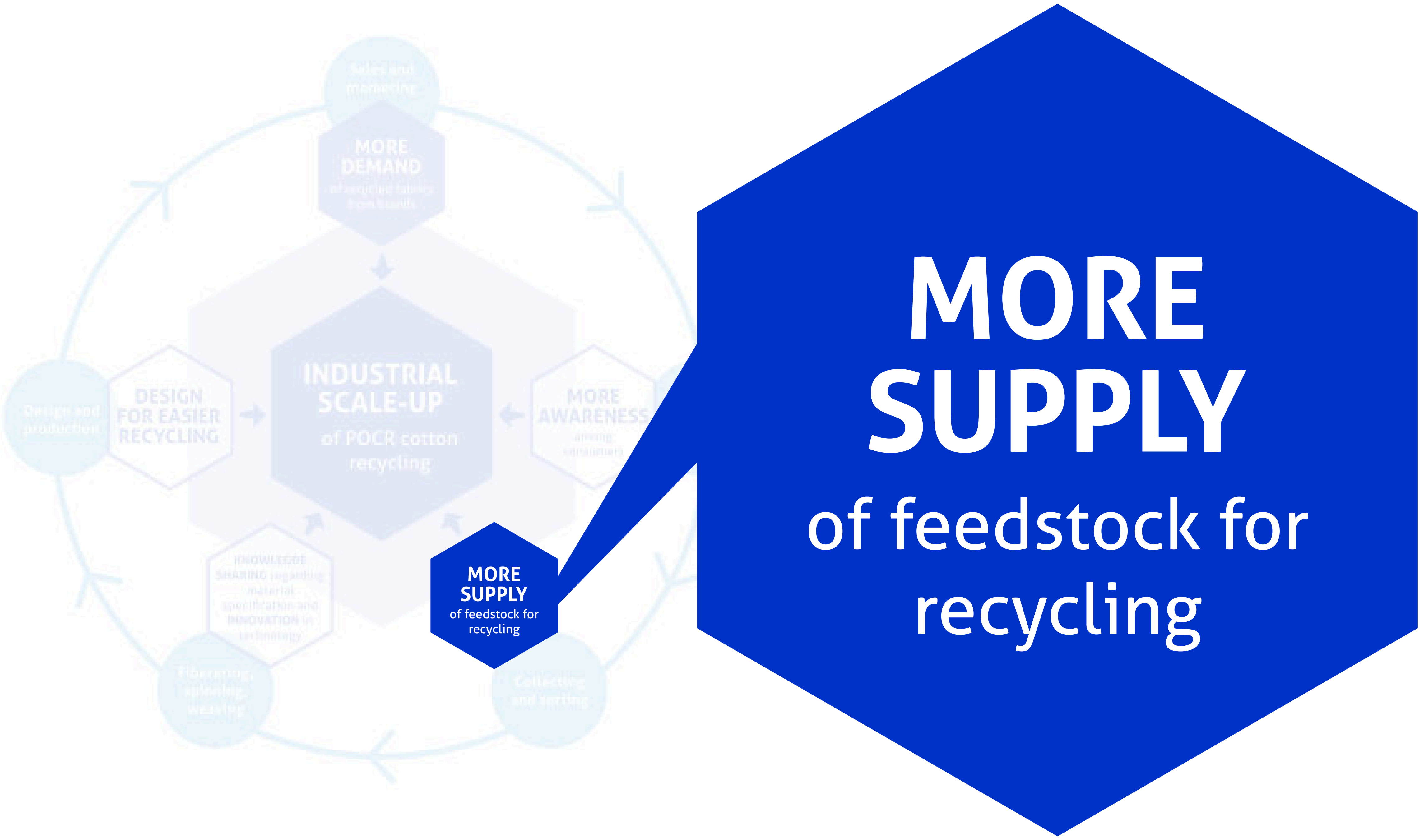
However, completely accurate traceability of the origins of the materials is not yet guaranteed. To achieve this, more transparency between supply chain partners regarding fabric quality data and fabric origins (Chain of Custody) will be required to accurately trace the source of POCR content in the yarn.

However, other participants have a different opinion. They believe that brands may choose to apply POCR cotton in textiles as a regular feedstock without providing consumers with specific, separate information about the origin and composition. To achieve this, the price of yarns with POCR cotton must decrease and the quality must improve, according to the participants.

Furthermore, the participants claim that the current quality of available POCR cotton is not yet competitive with raw virgin cotton. That said, according to some participants, there is a positive expectation of improvement due to new (pre-)spinning technologies or chemical recycling of cotton. The current lack of availability of textiles with high-quality POCR cotton requires more investment in these new techniques with respect to the recycling of POCR cotton.

Another challenge mentioned is that brands need to develop credible labels regarding POCR cotton, to ensure that the quality of POCR cotton is being held to a certain standard and to prevent greenwashing. Some participants of the monitoring indicate that it would help if brands accepted the additional costs of recycled cotton.

Challenge 2: more supply of feedstock for recycling



More supply of feedstock for recycling is required. According to the participants, this is related to current collection and sorting systems, the market and export barriers.

Collection

Participants indicated that the current collection system in the Netherlands can be improved by creating more awareness among municipalities about dry and clean textiles collection. Some respondents mentioned that collection via above-ground-containers in combination with a manual unloading system is especially preferable, so that the discarded textiles can be reused and recycled.

If municipalities collect in underground waste containers, these should stay dry through appropriate maintenance of the bins. Another important issue that was mentioned is the prevention of dumping of residual waste in textile bins, especially in Dutch municipalities where citizens need to pay for discarding their residual waste.

Challenge 2: more supply of feedstock for recycling

Sorting for 100% POCR cotton

According to the participants, sorting for recycling should be stimulated, especially the sorting of textiles with high percentages of cotton. The main challenge mentioned is the current high cost price of sorted feedstock. Scale-up will be required to make sorting for recycling profitable. Manual sorting is not currently profitable. As a result, investments in accurate sorting machines will be required to increase the speed and accuracy of mechanical sorting with scanning options.

On a related note, some participants indicated that fiberisers and spinners contribute too little for sorted materials and should pay the cost price of sorting. However, this concerns producers who regard fabric with post-consumer textiles as a raw material and generally do not want to pay more for it than for materials with 100% virgin textiles.

According to the participants, if producers were required to use POCR content under new European legislation (e.g. Ecodesign for Sustainable Product Regulation), the demand from brands would increase. They would then give more purchase guarantees, and this would give rise to new business models for sorting companies, fiberisers and spinners, resulting in positive changes.

Marketplace

Sales of feedstock by sorters are mostly based on sales relations between individual sorters and recyclers. A mature marketplace does not currently exist. This results in an unstructured system without a stable supply chain. Sales of feedstock can be improved by implementing material specifications and a proper guideline for sorting.

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Challenge 2: more supply of feedstock for recycling

Export barriers

Barriers for exporting sorted textile waste across borders to production countries outside the EU such as Turkey, Egypt, Pakistan and Bangladesh are also an issue. This leads to extremely difficult, sometimes impossible, export and import procedures for sorted materials for recycling in regular production countries. For example, these barriers result in high costs for exporting Dutch ready-to-recycle denim to recycling countries and in additional costs for mutilated textiles. Indeed, the latter is sometimes required.

Furthermore, some participants foresee problems with upcoming End of Waste legislation for recycling and Waste Shipment Regulation from the EU, affecting the options to export waste outside OECD countries. In order to stimulate the recycling of POCR textiles, they emphasise that is important to develop robust End of Waste criteria so that non-reusable post-consumer textiles that are commonly used for recycling purposes are classified as a resource rather than waste and could be exported outside OECD-countries.

In this context, some participants indicated that current European policy does not yet stipulate where European discarded textiles should ultimately be recycled. Sorters of POCR textiles and producers of recycled fabrics want export barriers to be removed so that the global market for textile recycling in Turkey, Morocco, Pakistan, India, China, Bangladesh and Egypt receives sufficient post-consumer feedstock, also from Europe. The reason being that, if we want to produce denim in large volumes with POCR content, the production of fabrics with POCR content must be able to take place in the regular production countries. At the same time, some participants mentioned that it is important that policymakers should explore long-term strategies to repatriate the supply chain, including the repatriation of the recycling industry to Europe.

Participants mentioned that it is important for the Dutch Ministry of Infrastructure and Water Management to explore solutions to import and export barriers. For example, it is currently working on a solution in the case of Turkey.

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Related challenge: design for easier recycling

Participants frequently mention design in order to promote the use of POCR cotton in fabrics and to generate more supply for recycling. Participants mentioned challenges on both sides: 1) understanding the use of POCR cotton and 2) making designs more suitable for recycling.

Understanding the use of POCR cotton

According to participants, there is still a lack of understanding among designers about the use of POCR cotton. Designers need to know more about how to design new clothing that contains POCR cotton. This therefore requires more co-operation and knowledge sharing between manufacturers of textiles and brands regarding design and quality requirements. In this field, the following factors are mentioned in particular: the diversity of terms, names and abbreviations for POCR cotton; limited data on fabric quality and limited availability of testing reports on POCR cotton; no data are available for fabric performance and knowledge building in the design process.

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Related challenge: design for easier recycling

The monitoring shows that designing fabrics with POCR cotton has its challenges. These are mainly to do with the look and feel of the product and with the requirements for certain styles. It will take a considerable period of time to implement this and to phase out styles without POCR cotton.

Making designs more suitable for recycling

Another issue is that there is still a lack of understanding among designers about the way in which they can make their designs more suitable for recycling. This means that designers must be made aware that their choices regarding the design have consequences for how easily garments can be recycled after they have been discarded. The participants made the following remarks about requirements to make a design more suitable for recycling:

- The POCR feedstock should consist of fewer mixed materials and more mono materials.
- Polyester should be avoided in fibres, as it is too difficult to recycle with the current mechanical recycling systems. For this material, we need innovations in chemical recycling.
- Garments that will be recycled should contain fewer buttons, zippers and seams, and a design for disassembly will be required to ensure that buttons and zippers used are easy to remove.

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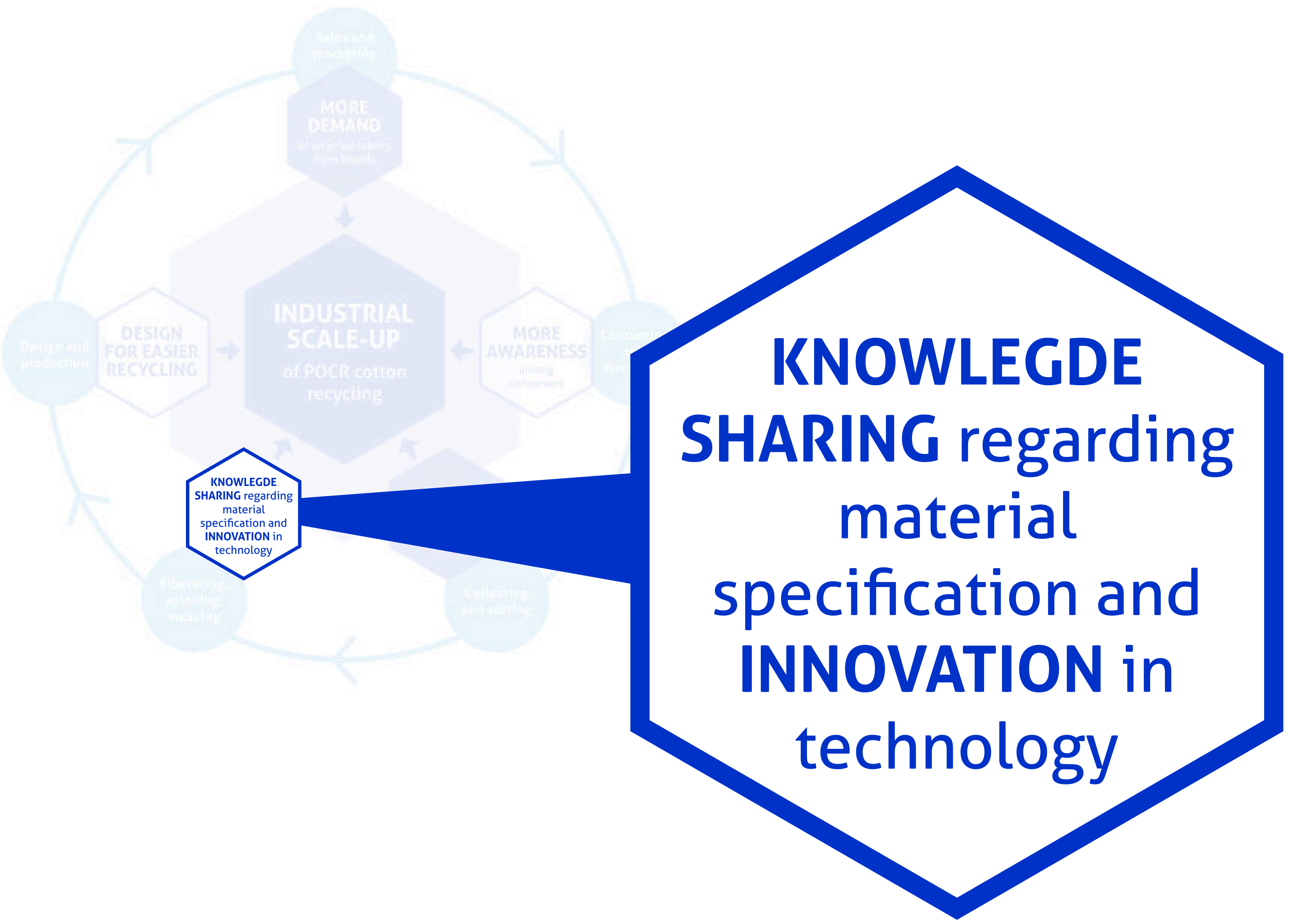
Related challenge:

knowledge sharing regarding material specification of post-consumer feedstock and innovation in recycling technology



According to the fiberisers, spinners and weavers, the production of textiles with POCR cotton is still in the early stages of development. At this point in time, recycled materials are often a mix of mostly pre-consumer material and post-consumer material. Pre-consumer material is regularly incorporated in the production of recycled fabrics, whereas post-consumer material is linked with the specific customer order requirement.

According to weavers, the mix of post-consumer and pre-consumer recycled cotton accounts for anything between 1% up to 10% of the total produced woven fabrics for denim production. On average, half of this is POCR content. If it is more, for example if the mix of post-consumer and pre-consumer recycled cotton accounts for 25% of the total, then the share of POCR content is significantly lower: around 10% (not 50%).

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However, one of the recyclers reported a higher share for post-consumer cotton only: 35% POCR cotton in woven fabrics. Moreover, this company participated in the Accelerating Circularity Project Europe (ACPE) trials with a fabric containing 40% POCR cotton in denim.

Participating weavers indicated that they produce fabrics woven with POCR cotton mainly for brands other than Denim Deal brands. Denim Deal brands order in a bandwidth of 1-28% of the total production of these weavers. Spinners and weavers highlighted the challenge of balancing sustainability with affordability. Exploring cost-effective recycling technologies, optimising production processes and collaborating with brands to share costs could be potential solutions. Furthermore, manufacturers rely on the demand from brands for the development of POCR fabrics. To promote the use of POCR cotton, brands should actively support and purchase recycled fabrics from mills, thereby demonstrating commitment and driving market change.

The challenges lie in sourcing post-consumer fibres suitable for recycling. The question is how the quality and volume of feedstock of mono material from discarded textiles can be improved. Partnerships with waste management companies and infrastructure development are essential for this. The scarcity of sorted wastes that are free from non-cotton materials such as Lycra and polyester is an issue.

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According to participants, sorters cannot solve the problem alone. Innovations in dyeing and spinning processes are also an important step. And if polyester is used in a blend, the recycling of this material will be more difficult compared to the use of mono materials. Participants indicate that it is important to include this aspect in the design.

Despite the fact that, according to some participants, textile fibre companies have been working with upstream industrial textile waste collection and sorting companies for many years, there is still a need for more co-operation to improve the recycling process. In particular, more knowledge sharing will be required between sorters and fiberisers, spinners and recyclers with regard to material specification of feedstock for recycling.

In order to stimulate recycling, participants indicated that the development of guidelines for sorters, providing clear material specifications to the criteria set by recyclers, could help in the knowledge sharing process. To improve the recycling process, some spinners mentioned that it is important to share material-related data rather than confidential process-related data.

Further innovations and investments in recycling technology will also help to scale up the application of POCR cotton in fabrics. The previous monitoring report concluded that there is a need for a higher quality of POCR cotton in denim. In this context, brands and recyclers mentioned that five quality requirements of fabrics with POCR content are important: high-quality/long staple fibre length (required for spinning quality yarn), appearance/aesthetic of the garment, texture of the fabric (feel and touch), user quality, longevity of the garment.

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At the start of the Denim Deal, participants indicated that achieving the same strength and durability with post-consumer recycled cotton as with pre-consumer recycled cotton, or virgin cotton, was a considerable challenge. In this context, some brands, spinners and weavers indicated that innovations should focus on improving manufacturing processes because recycled content with more than 20% POCR cotton currently generates less strength, which makes it more difficult to run denim processes such as dyeing, weaving and finishing.

Another challenge mentioned is to achieve a higher quality by removing all synthetic fibres. During the weaving of denim, any irregularities are sometimes not yet visible, but when the cloth is dyed or treated, these irregularities due to synthetic fibres will become visible.

Nevertheless, some brands and spinners mentioned that significant technical progress has been achieved in recent years (2022-2023) by fiberisers, spinners and weavers to improve the quality of fabrics with POCR content. The use of 20% POCR material in the cotton blend currently offers the same physical quality metrics as 100% virgin cotton. This was demonstrated during the two quality workshops organised within the context of the Denim Deal where technical data sheets were shown to the audience.

For more details: the Denim Deal steering committee commissioned Saxion to conduct a study on technical issues and challenges regarding the application of POCR content, which is published on www.denim-deal.nl.

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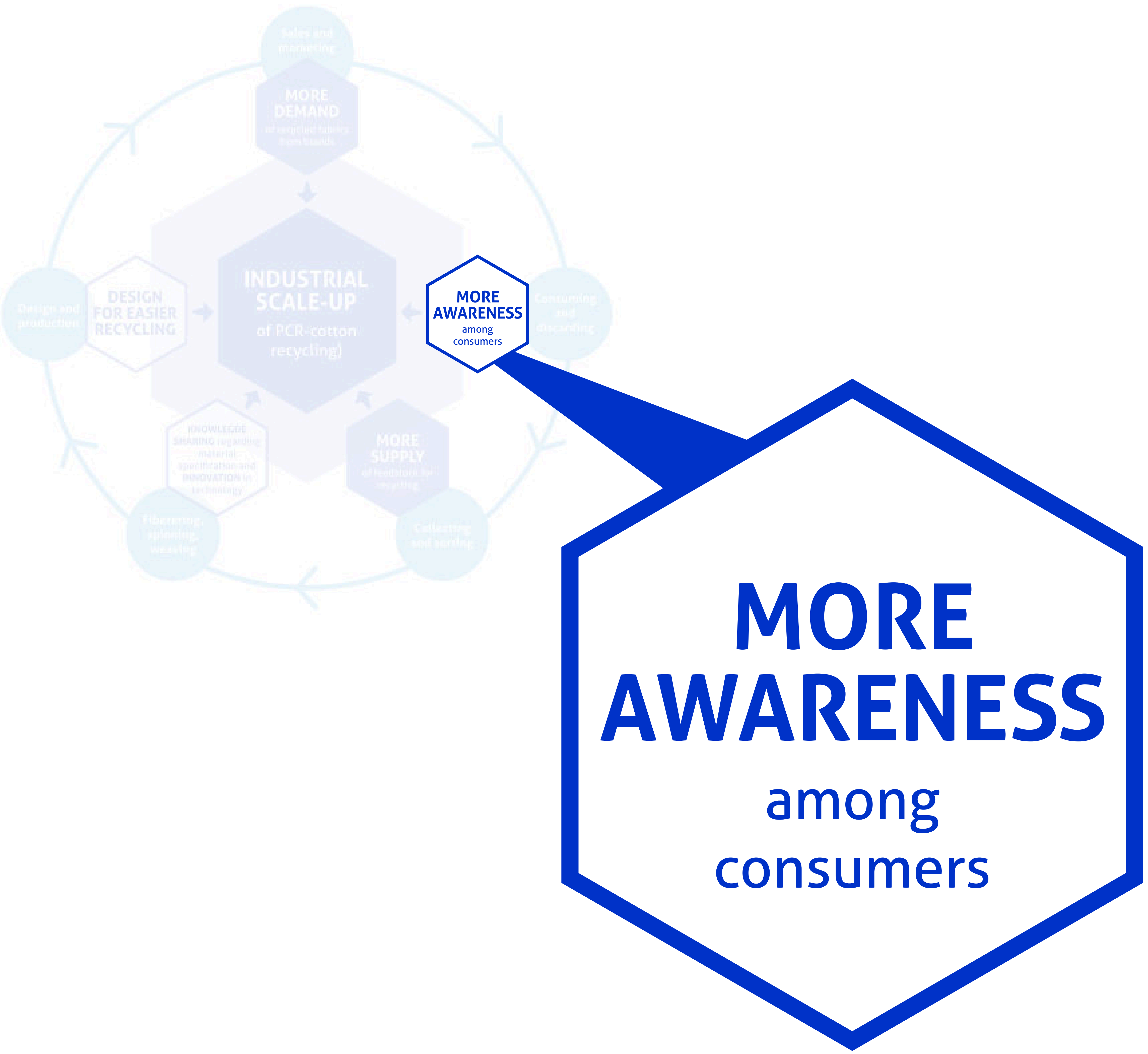
Related challenge: more awareness among consumers



Consumer awareness will increase if brands boost the marketing of fashion with recycled content; brands should promote sustainable clothing with recycled post-consumer textiles as a fashion trend. Consumers should become more aware of the environmental benefits of POCR cotton, so as to increase demand for brands using POCR content. It is important to spread the culture of wearing recycled fabrics, thereby increasing consumer awareness of the benefits of recycling and the fact that recycled fabrics are equal to virgin fabrics.

Brands currently give priority to high-quality fabrics with POCR cotton, whose quality is comparable to that of virgin cotton fabrics. However, other stakeholders suggest that communications about the environmental benefits of POCR cotton should receive priority. According to the participants, marketing efforts of brands should focus on increasing willingness to buy sustainable fabrics.

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Related challenge: more awareness among consumers

Furthermore, consumers should get access to credible information about the origin of POCR content in labels, so they can verify the reliability of recycled fabrics. The Ecodesign for Sustainable Products Regulation (ESPR) is an EU initiative to make sustainable products the norm in the EU. Part of the proposal is to develop a passport for products, including for textiles, which will increase traceability for parties in the supply chain and will help provide consumers with information about environmental effects. This also makes it more difficult to come up with sustainability claims without substantiating them.

Besides gaining awareness, consumers should also learn to properly drop discarded textiles in textile bins[1]. If consumers dispose of their textile waste properly, the supply of feedstock for recycling will increase and the recycling process will become considerably easier. 2021 indeed showed a clear improvement trend in the Netherlands regarding the amount of textile ending up in residual waste versus that collected in separate textile bins. In 2018, 8.5 kilograms per inhabitant ended up in residual waste, which decreased to 5 kilograms by 2021. In 2021, 6.6 kilograms of textile per inhabitant were collected separately. This makes 2021 the first year, since measurement began, in which more textile was collected separately than ended up in residual waste.

1) Source: Monitoring beleidsprogramma circulair textiel, https://www.rijksoverheid.nl/documenten/rapporten/2023/06/26/bijlage-3-monitoringrapportage-beleidsprogramma-circulair-textiel-2021. FFact will conduct a new mass balance study into the year 2022 and EPR implementation in the Netherlands will provide new data on the amount of discarded textiles and reuse and recycling.

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Together we make sustainability visible

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Photographs in this report are courtesy of Mudjeans, PVH, Kings of Indigo, Agi Denim, Garcia, Wolkat and Kuyichi.

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Rijkswaterstaat commissioned this report under the responsibility of the Ministry of Infrastructure and Water Management.

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