

# WP1 | R-Strategies

## and their use in ASTER

### DEFINITIONS AND UNDERSTANDING

A guideline through the Activities

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## INTRODUCTION

The EU funded ASTER project aims to harmonize waste reduction efforts in the Alps, focusing on outdoor products by improving policies, raising awareness, and facilitating practical solutions through tools, training, and regional cooperation. The projects' overall objective is to shift towards a circular and resource-efficient economy in the outdoor sport sector, contributing to carbon neutrality and a resource sensitive Alpine region. As a main tool, the ASTER project suggests implementing the 5R strategy to minimize waste before (refuse, reduce) and after (reuse, recycle, repair/repurpose) it's creation (Interreg Alpine Space, 2024). Within the ASTER project application, the 5R strategies used have not yet been standardised (Figure 1).

### From the AF:

- **S. 42:**  
Refuse, Reduce, Reuse, Repurpose, Recycle
- **S. 50:**  
Refuse, Reuse, Repurpose, Recycle, Repair



### From the Literature:

- R0 Refuse
- R1 Rethink
- R2 Reduce
- R3 Reuse
- R4 Repair
- R5 Refurbish
- R6 Remanufacture
- R7 Repurpose
- R8 Recycle
- R9 Recover
- Landfill/incineration

- Smart product use and manufacture
- Life extension strategies
- Creative material application



cf. ASTER project description

cf. Potting et al. 2017, in: Kirchher et al. 2017

Figure 1: R-strategies from ASTER compared to R-strategies in literature (Source: own illustration)

This input paper aims to create a project internal common understanding of circular economy and definition of the R-strategies. The objective is to be transparent regarding the use of the R-strategies in ASTER.

## DEFINITION OF R-STRATEGIES IN CIRCULAR ECONOMY

In the last decade, the concept of circular economy was addressed a lot in science, policy but also in practice. However, definitions are multifaceted and critics rightly claim that the concept and its principles have changing definitions in different contexts (Kirchherr et al. 2017, Wardeberg et al. 2024).

The United Nations Environment Programme (UNEP) provides a circularity approach based on “[...] value retention loops [...]” (UNEP 2025), that is shown in Figure 2. The circular processes defined in this approach all follow the guiding principle *reduce by design*. This premise focuses on creating products and services that require fewer materials throughout their lifecycle. The approach aims to decrease raw material extraction, optimize production processes to use less material, and influence consumption patterns and end-of-life considerations, thereby minimizing overall impact and waste. The underlying R-strategies address flows between different actors:



- **User to user:** The consumer can decide through consumption choices whether refusing specific products, reducing the frequency of buying, or reusing things we already have.
- **User to business:** Businesses and consumers have the opportunity to enlarge the lifecycle of specific products. Therefore, the willingness to repair from the consumer side but also the opportunity to refurbish or remanufacture by the industry is needed.
- **Business to business:** The industry must find ways to reintroduce materials into the lifecycle of products. This can be either through recycling processes to gain secondary raw materials or the repurpose of wasted products.

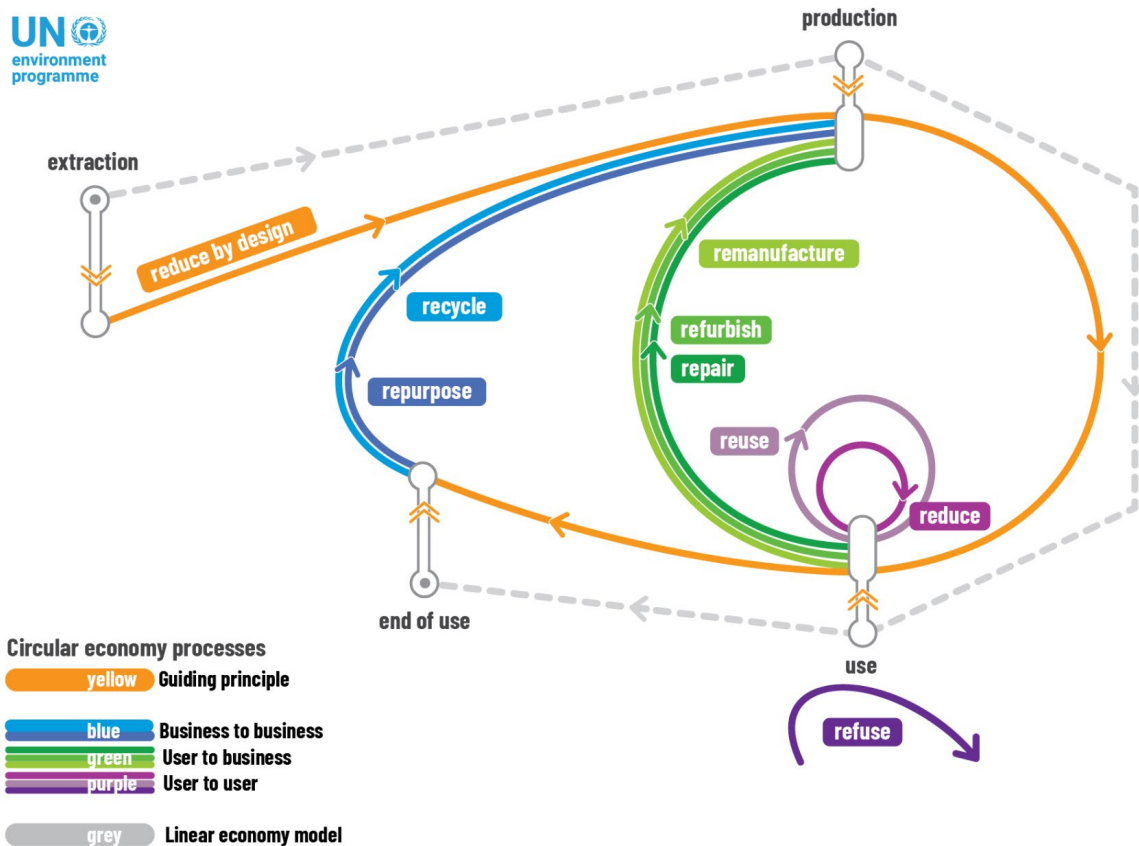


Figure 2: UNEP circularity approach (source: UNEP 2025)

In the various research publications and approaches for circular economy models, there are different numbers occurring when it comes to R-strategies. This is strongly depending on the context and the sector the study is referring to (Kirchherr et al. 2017). As ASTER is focusing strongly on the textile sector, and in particular on outdoor products, our definition follows a 10R approach as presented amongst others by Schnatmann et al. (2023) or Schimper (2025) for the textile sector. It is important to emphasize that this 10R approach is cross-sectoral, and thus applicable to other sectors, such as the plastics industry.

As part of his research, Schimper (2025) has produced a very accurate and comprehensive overview of the textile production chain. In addition to the R-strategies, he refers to their target, possible implementation variants and initial calculations on the influence on value creation. We took this overview as a basis and further developed some of the content. It is particularly important to highlight, that circular textile production streams involve an effective collection system for used textile waste and requires sor-







# APPLYING R-STRATEGIES IN THE ALPINE TEXTILE SECTOR

According to the UNEP circularity approach (Figure 2), achieving a circular economy and implementing R-strategies requires the participation of two groups: users and businesses. However, this approach should be broadened to include manufacturers and authorities, ensuring the involvement of all stakeholders in the textile sector. It is important to note that not all four groups contribute equally to each of the R-strategies. In the ASTER project, the role of users in the 10R process will be excluded due to the challenges of obtaining reliable data on consumer behavior, which would require extensive and detailed surveys to accurately assess.

Table 1: Application of R-strategies in the textile sector and role of different actors (based on UNEP 2025)

	R-strategy	Manufacturer	Business	User	Authority
Smarter product use and manufacture	<b>R0: Refuse</b>	Refusing the use of hazardous substances in the design of a product.		Buy or use less, by saying no., e.g., reject packaging, shopping bags, or other products or services that are considered unnecessary.	
	<b>R1: Rethink</b>	Rethink the design phase of a product.	Innovate business models that consider environmental and social impacts.		
	<b>R2: Reduce</b>	Improve process efficiency (e.g., minimizing waste).		Use items and services for a longer time, and buy less frequently.	
Expand lifespan of a product and its parts	<b>R3: Reuse</b>		Include secondhand sales and reselling.	Hand over to another user.	
	<b>R4: Repair</b>	Considering reparability during product design	Fixing of a specified fault in an object that is a waste or a product and/or replacing defective components.	Send or give products to repair services.	Create incentives (e.g., Austrian repair bonus).
	<b>R5: Refurbish</b> <i>Is more easily imagined for other sectors, such as electronics, but not in clothing textiles.</i>		<i>Modification of an object that is waste, or product to increase or restore performance and/or functionality, or to meet applicable technical standards or regulatory requirements.</i>		
	<b>R6: Remanufacture</b> <i>Is more easily imagined for other sectors, such as electronics, but not in clothing textiles.</i>		<i>Standardized industrial process that takes place within industrial or factory settings, in which cores (product or module which has been sold, worn or it is no longer functional) are restored to same-as-new, or better condition and performance. The remanufacturing process is in line with specific technical specifications, including engineering, quality, and testing</i>		





## THE ASTER APPROACHES

In the ASTER project, every Activity is dedicated to some of the R-strategies defined in the chapter before. Table 2 provides an overview of the distribution of the Rs to the Activities in the three work packages.

Table 2: Use of R-strategies in the ASTER activities: an overview (The grey boxes highlight the Rs that are addressed in the Activities).

Work Package	Activity	R0 refuse	R1 rethink	R2 reduce	R3 reuse	R4 repair	R5 refurbish	R6 remanufacture	R7 repurpose	R8 recycle	R9 recover	
1	1.1 Mapping of 5R facilitators in the Alps the state of Alpine solutions for circular products											
	1.2 Mapping of Alpine regulations and economic policies for waste management											
	1.3 Waste potential analysis											
2	2.1 Collaborative prototyping/eco-design of outdoor textiles and corresponding business models											
	2.2 Testing business models											
	2.3 Pioneering waste solutions	to be concretized										
3	3.1 Policy brief	to be concretized										
	3.2 Training materials											
	3.3 From circular models to circular value chains: turning micro business models into Alpine value chains											
	3.4 Regional multiplier events	to be concretized										
	3.5 Transferring best practices											
	3.6 Polymer waste management within EUSALP: clustering with EUSALP action groups and EUSALP Youth Council											
	3.7 Polymer waste management within the strategies of regional authorities: fostering exchange with public authorities											



## COMMUNICATION ABOUT R-STRATEGIES IN ASTER

The primary goal of the ASTER project is to promote a transition toward a circular and resource-efficient economy within the outdoor sports sector, with a particular focus on the Alpine region. To align with this objective, all R-strategies should be considered. Consequently, in general communications about the project (e.g., on the website or in presentations), the term "R-strategies" should be used to reflect the project's overarching goals. If only specific strategies are addressed, it is important to clearly specify which ones are being discussed and provide relevant details.



## SOURCES

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