Resail®

THERE IS ALWAYS A SECOND LIFE FOR SAILS

MAKING THE SAILING WORLD MORE SUSTAINABLE BY THE LARGEST SAIL CLEANUP IN THE WORLD

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FOUNDERS

SJAAK HAAKMAN
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INTRODUCTION

The development of plastics since 1945 have given the sailmakers an endless opportunity to develop better, faster and longer lasting sails. Like many industries local craftsman have disappeared and replaced by global players that primarily produce sails in low income countries. Local lofts are either service centers or focus on making covers, sprayhoods and repairs.

This industry has a huge ecological footprint using big plants, lots of chemicals and recycling is not part of the business model. For the future of our planet and the watersports industry we need to change this.

In this whitepaper we talk about; Who are the big names in the industry, which materials are used and how sustainable is this part of our wind powered pastime?

THE SAIL MANUFACTURING MARKET

in relation to global sustainability goals

1

PRICING

Price increases of raw materials (Oil & Gas) and its connected ecological impact will drive innovation and change.

2

ENVIRONMENTAL AWARENESS

First movement of use of recycled material and/or material that can be recycled is introduced and will continue to grow. Customers (Sailors & Surfers) will embrace the use of alternative sustainable materials as long as they are durable and an economical alternative (It is an illusion that there is a market for sustainable products when it is more expensive)

3

THE RACING MARKET

The high end racing market will always want the fastest sail no matter what the cost or its durability; this will only be limited by class/race organizations & governing bodies.

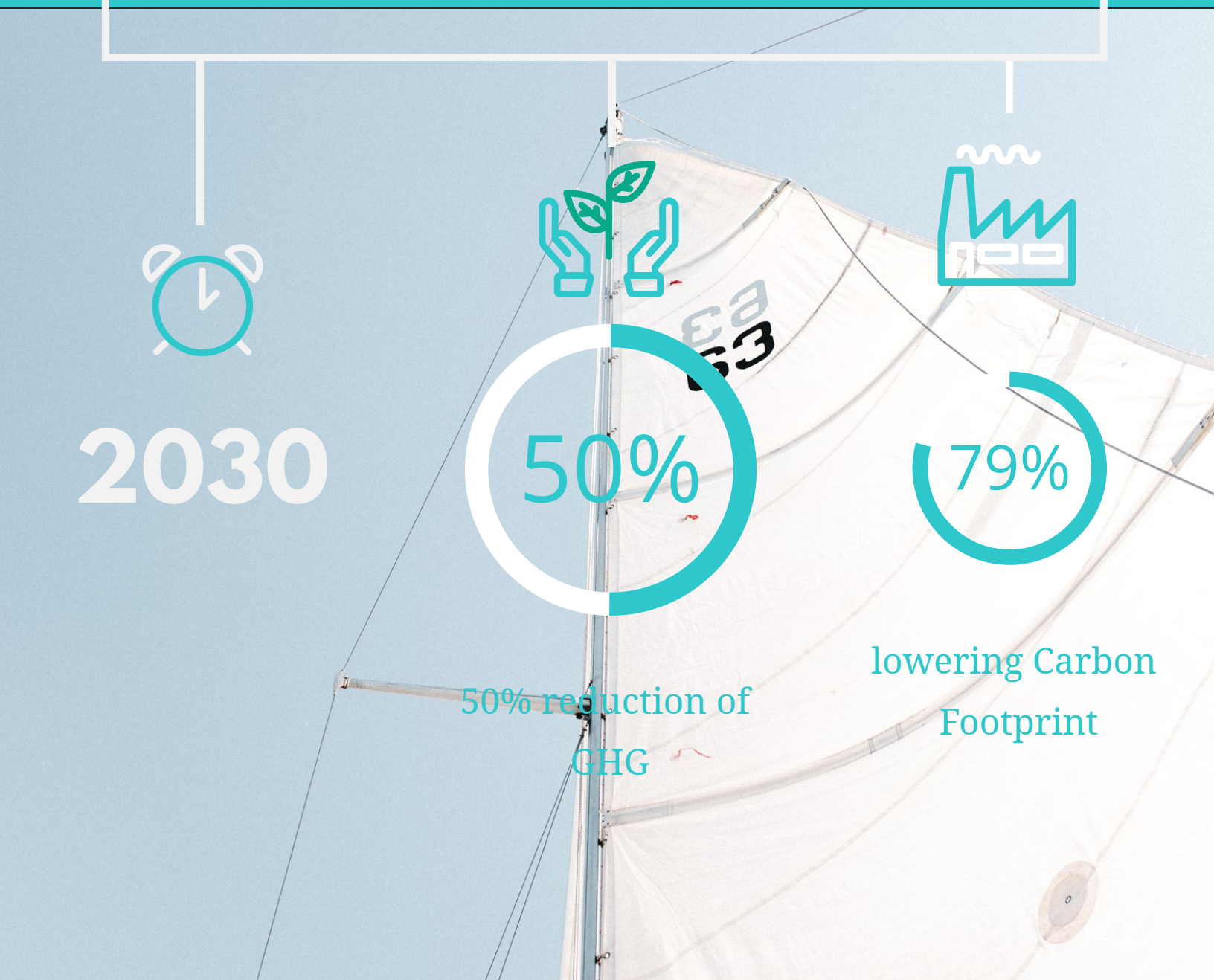
4

ECONOMICAL VALUE

All plastics (and so also sails) can be recycled; the questions are: is it economically viable? or who is willing to pay for costs of taking the sails back and give them new purpose.

THE QUESTION IS ?

50% reduction of GHG by 2030, towards Net Zero Emission, lowering Carbon Footprint. Is this on the agenda of the Industry leaders?



ORIGIN OF SAILCLOTH

Sails have traditionally been made from natural materials; they were made from linen, flax, wool and cotton; organic material that eventually “disappeared”

After WWII polyester and nylon fibers were introduced by chemical companies using oil as basis. ICI (UK) developed Terylene, DUPONT (USA) Dacron. After the 70’s we have seen the introduction of laminates and a variety of strong materials such as Kevlar, aramide, PBO and carbon.

Besides fibers different coatings and impregnations from particular chemicals based on Poly-urethane (PU) or melamine are being used in the finishing of the product

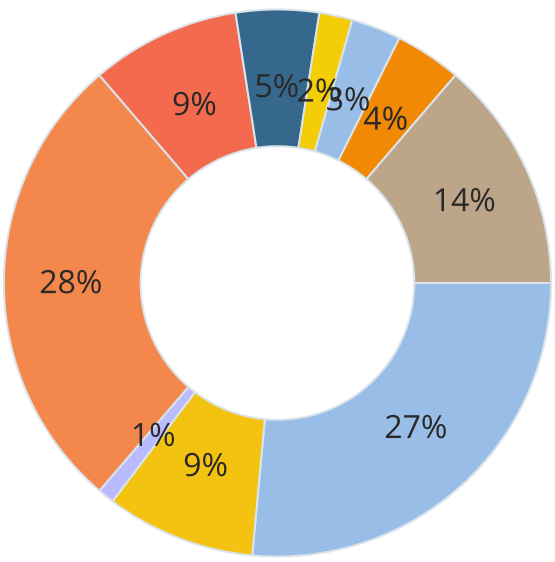
There is always new life for sails!

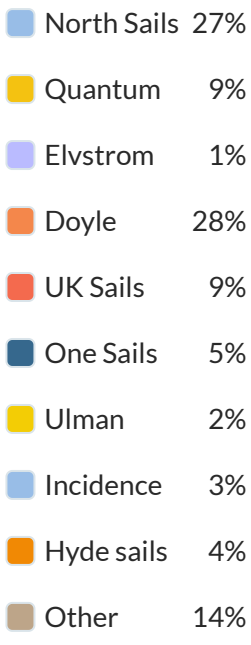
MARKET SIZE

Sailmaking is a niche within the plastics / textile industry with an annual turnover of approx. $ 500 million. The yacht sails market shows some annual growth whereas the (kite)surfing and wing-surfing market is booming.

>13 million m2 is being produced annually which equals 10 times the area of Greater London. Upcycling or other re-use in new products is less than 10% of what is produced; recycling is non-existent to this date.

In sailmaking USA companies (North Sails, Doyle and Quantum) are dominant.



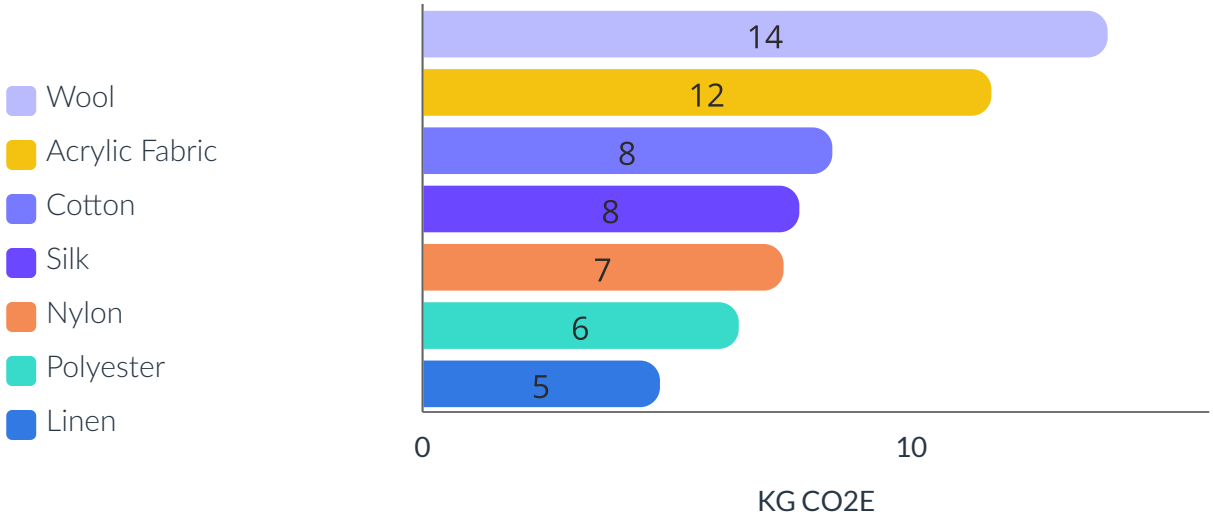


Environmental impact

Carbon footprint

The environmental impact of producing sailcloth and sails, the distribution and use of them have many factors that need to be considered:

- Oil & Natural gas are the basics of plastics which have a negative environmental impact in harvesting and are a finite resource
- Transport of raw materials and semi-finished products around the world to and from low income countries have a huge CO2 impact; 80% of emissions globally are generated from within the supply chain (Mckinsey & Company)
- Recycled materials too have a carbon footprint, it is not always a better, greener solution and in most cases it is more expensive
- Recycling of plastics possibly implies the further distribution of microplastics
- Burning plastics produces toxic fumes



PLASTICS IN SAILS

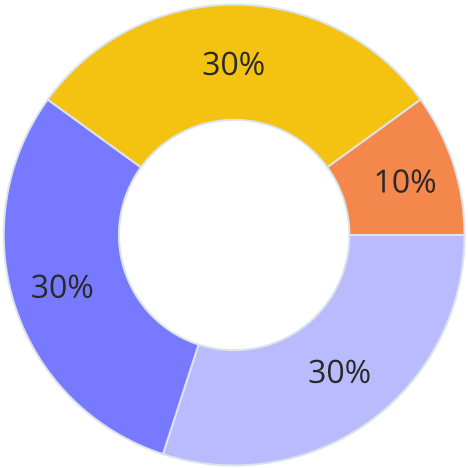
Plastic Type	Brandnames	Use	Caracteristics
Nylon		Spinakers	low weight; higher stretch and higher take up of water than other material
Polyester (PET)	Dacron;Terylene, Tetoron, Trevira and Diolen	All sails except spinakers	Relative low cost; quick drying; long lasting
PEN Fiber	Pentex / Mylar	Base material for laminates	Compared to PET 40% less stretch
Aramid Fibers	Kevlar; Technora;Twaron	High end racing	Loses strenght twice as fast as PET under UV; sails must be handled carefully, flogging and bad handling causes loss of strenght
Polyethylene (UHMWPE)	Spectra; Dyneema; Certran; Endumax	High performance sails	High strenght; changes shape with age
PBO	Zylon	Very little use in sails	High strenght; very UV sensitive
Liquid Crystal Polymer	Vectran	Cruising Sails	High durability;
Carbon Fibre		High performance sails	Very strong and light, UV resistant; expensive

Help us to reduce the carbon footprint of the sailing industry for a better planet.

MANUFACTURING

Manufacturing of sailcloth is being done everywhere in the world mostly by companies that are supplier to the textile industries

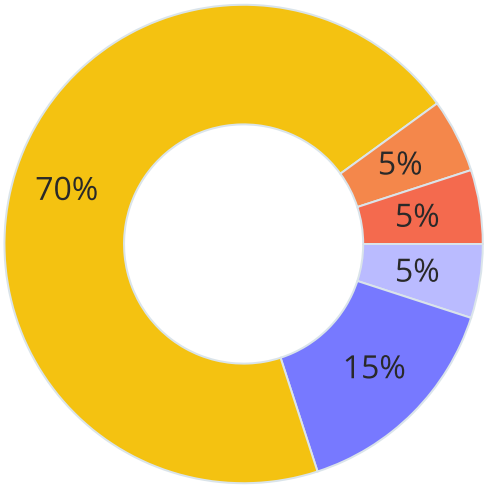
Sailcloth Manufacturing



EUROPE 30% USA 30% ASIA 30%

AFRICA 10%

Sails Production



EUROPE 5% USA 15% ASIA 70%

AFRICA 5% AUSTRALIA 5%

SAILMAKERS GLOBAL PLAYERS

COMPANY	WEBSITE	COUNTRY	TYPOLOGY
NORTH SAILS	www.northsails.com	USA	Has a strong presence in all markets from windsurfing to ocean racing in the high end racing market almost monopolist; (Group Revenue: $ 928 Million) Produces 30.000 sails / annum
ELVSTROM SAILS	www.elvstromsails.com	Denmark	supplies many OEM sails to the yacht builders;
QUANTUM SAILS	www.quantumsails.com	USA	A strong contender of North sails in the TP52 and Superyacht market (Acquired HOOD Brand)
HYDE SAILS	www.hydesails.co.uk	UK	Produces 40.000 sails/annum; mainly in the Philippines
DOYLE	www.doylesails.com	USA	50 lofts; Quingdou (China) is a large production facility;
DURTEK SAILS	www.durteksails.com	Sri Lanka	OEM Manufacturer; works for Sailselect
NEILPRYDE	www.neilpryde.com	Hong Kong	Large in windsurfing sails and apparel
ONE SAILS	www.onesails.com	IT	
UK Sailmakers	www.uksailmakers.com	USA	Started as Ulmer Sails;
Rolly Tasker Sails	https://www.rollytaskersailsaustralia.com.au	AUS	Has a large production facility in Phuket (Thailand); also produces for Sailselect
ULLMAN SAILS	https://ullmansails.com	USA	Acquired Bettersails (South Africa); for large production volumes
INCIDENCE SAILS	www.incidence-sails.com	France	Big in the French offshore market (Figaro etc.)
GLOBAL SPORTS LANKA PVT	http://www.gslanka.lk	Sri Lanka	OEM Manufacturer of Sails, Kites, Dinghy Sails and Tents for internationally recognized brand names
Aquadynamics	www.aquadynamics.eu	Sri Lanka	OEM Manufacturer; Produces > 1million M2 Annually

Help us to reduce the carbon footprint of the sailing industry for a better planet.

USE OF SAILS

WHEN ARE SAILS DISCONTINUED

1. **High-end racing market**

   TP52, America's Cup, Olympic Sailing: within 1 year

2. **Local club racing**

   1-3 years

3. **Surfing & Kiting**

   1-3 years

4. **Cruising fleets (Charters)**

   < 5 years

5. **Cruising market**

   < 10 years

How it works

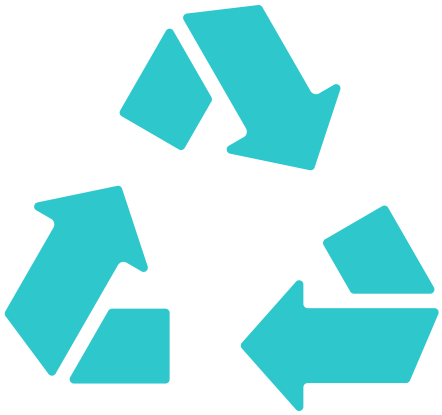
THE SAILS

Sails are mostly used for years, staying with the boat until they are replaced and many times stored for long periods after replacement. Racing sails are often replaced or sold to a less critical sailing team after a few races. Sails wear and tear from usage and under the influence from elements, sun, water and salt. The materials are durable but over time form and function degrades which causes discontinued use. Than what happens? Growing markets are kite and wing-surfing

The R's:
Repair, Re-use, Re-sale, Re-furbish

Sails are repaired, washed and sometimes re-coated until its form or function disappears. Racing sails of top sailors are often sold to second tier competitors in its first season.

Re-use and "upcycle" of old sails into new products are widely seen but count for a small percentage. Sails that are relatively "new" (<3 years old) are eligible for upcycling; older sails should be considered for recycling.



The sailing industry has a huge ecological footprint. Using big plants, lots of chemical. Unfortunataley recucling is not yet part of the business models!

Examples of companies active in the “upcycling” market

Recycling of sailcloth (Bringing it back to its original virgin raw form) is challenging for the same reasons valid in the textile industry:

- Sails are coated and/or colored and therefore difficult to bring back to virgin material
- Laminated sails consists of glued layers; difficult to separate

In general only 9% of plastics are recycled (see OECD report) Recycling of sails is non-existing but the upcycle market is growing and is possibly bigger (in %) compared to the textile industry)

EXAMPLES

NAME	WEBSITE	OFFERING & TYPOLOGY	SINCE	LOCATIONS
		USED SAILS		
727 Sailbags	www.727sailbags.com	Bags & Accessories; Collects 65.000m2 annually; 2021 Revenue: € 10 million	2010	France & USA
Mafia Bags	www.mafiabags.com	Bags & Accessories	2012	USA, Tokyo, Buenos Aires
8 Beaufort	www.8beaufort.hamburg	Sneakers, Bags & Accessories	2019	Germany
Sailmate	www.sailmate.eu	Bags & Accessories	2018	Germany
Sailbagsmaui	www.sailbagsmaui.com	Bags & Accessories	2009	Maui / Hawai
Sails and Canvas	www.sailsandcanvas.co.uk	Bags & Accessories	2015	UK
Sea Land Gear	www.sealandgear.com	Bags & Accessories	2015	S-Afrika
		TRUCK CANVAS & FIRE HOSES		
Upcycle Studio	www.upcyclestudio.com.au	Bags & Gifts	2013	Australia
BENDL	www.bendl.nl	Bags&Belts	2018	Netherlands
Madoc Paul	www.peace4you.net	Bags & Accessories	2001	Germany
FREITAG	www.Freitag.ch	Bags & Accessories; 2021 Revenue: $ 20.6 Million	2004	Switzerland / S-Korea
UNBEGUN	www.unbegun.nl	Bags & Accessories	2015	Netherlands

ANALOGY TO OTHER MARKETS

TEXTILES: Looks a lot like the textile industry with some distinction

1

TIMING

Sails are usually pre-ordered in Fall/Winter for use in next Spring so there usually is no over-production or waisted stock

2

Purpose more important then looks

It is not a “fashion” industry; buyers want the best sails for its use

3

FAIR LABOUR CONDITIONS

Labour conditions (In Thailand, Sri Lanka) seem be fair, North Sails has several statements on its website (Fair Labor Practice)

For the remainder it is the same:

Oil based. Many transport movements in the production chain. Sail making primarily in low income countries. Very little re-use / re-cycling. No circular design. There are substantial cut-off waists in the production process.

Design for re-use (Circularity)

To our knowledge there is no circular designed sail or sailcloth; however there are several sustainable developments:

Elvstrom sails/Challenge Sailmakers:
Elvstrom sails and Challege Sailmakers take sustainability serious; Under its EKKO logo Elvstrom offers sails made out of recycled PET Challenge Sailmakers promotes ECOPAK (recycled PET) and Repreve for its outdoor solutions Using recycled PET saves large amounts of CO2 and decrease the use of oil and natural gas.

Dimension-Polyant:
Claims their facilities to be climate neutral. Cleentec is their label for environmental "green" products. The company's premium product Hydra Net® radial is manufactured with bio-based Dyneema® fibers.

Onesails:

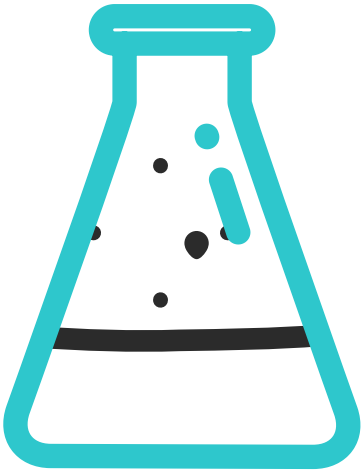
Claims that their 4T Forte is a “green” recyclable sail; (4T is based on a Teijin product)
It is recyclable into new plastics therefore saving CO2 and decreasing the use of oil and natural gas.

North sails:

Appointed a sustainability manager in 2021; In their apparel business they are offering bags made from recycled sails and repreve (recycled PET) is used in their apparel.

RESEARCH

In general al lot of research is being done on plastics and its recycling; however according to the OECD only 9% of all plastic waist is being recycled. Because sails are colored, coated and/or glued (as in laminates) it is not easy to recycle and therefore in most cases not economically viable; re-use and upcyling is therefore short term the best solution. Some research has been done:
Saxon Textile Research Institute (STRI/Germany) has done investigations in co-operation with Dimension-Polyant
Recycling firm Cure Technology (NED) has done research to bring polyester back to virgin yarns but has discontinued this because of lack of support from the industry.



DEVELOPMENTS BY OPINION LEADERS

Movements towards circular design of sails are not visible, question is whether there is awareness and latent demand from the sailing community; there are opinion leaders that indicate change:

11th Hour Sailing is Promotor of the TP52 class and founding partner of the Ocean Race; promotes sustainability in many ways but unfortunately NOT in the use of materials of boats and sails.
https://11thhourracing.org

The Ocean Race; “Racing with a purpose” the 2021 Race will start January 2021. The organization has many sustainable goals but unfortunately NOT in the use of materials of boats and sails.
https://www.theoceanrace.com

The Ellen Macarthurfoundation is a leading institute regarding circular economy and sustainability that started from a circumnavigation by Dame Ellen Macarthur
https://ellenmacarthurfoundation.org

The next (37th) America’s Cup, the oldest trophy in international sports does not have a large “sustainable” agenda; but hydrogen powered chase boats are obligatory.
https://www.americascup.com

DEVELOPMENTS BY OPINION LEADERS

The Sustainable Yachting Network or SYN – is a program coordinated by the Prince Albert II of Monaco Foundation in partnership with the Yacht Club Monaco; it has a “green” agenda but one can ask whether much of the superyacht market can be considered sustainable or “green”

April 22, 2022 World Sailing announced The Carbon Fibre Circular Demonstration Project; aimed at reusing and realigning carbon
www.sailing.org

VISION 2030

Sailmakers and Sailcloth manufacturers will collect old sails and take care of upcyling or recycling in their partner network

New sails will be made from recycled material or will be manufactured from materials that can be recycled

NEXT STEPS

Future initiatives by Resail

1

RESEARCH & PUBLISH

Research & publish about the plastic type(s), chemicals used for coatings and finishing

2

RECYCLING

Develop with partners recycling options and knowledge to eventually develop circular sail design

3

COLLECT

Collect used sails for upcycling and recycling

4

MARKET PLACE

Offer upcycled and recycled products through (web)shop, partners and events.

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THERE IS ALWAYS NEW LIFE FOR SAILS

SOURCES & DISCLAIMER

https://en.wikipedia.org/wiki/Sailcloth#Further_reading

https://ellenmacarthurfoundation.org

Websites of the sailmakers and sailcloth manufacturers

Global Plastic Outlook:
https://www.oecd.org/environment/plastics

Public sources mainly google searches.

McKinsey & Company; Starting at the source; sustainability in the supply chain.

Publicly available sources have been used to write this paper; we have not been able to verify all information.