



COMPARATIVE LCA ENVIRONMENTAL BENEFITS OF SUSTAINABLE YARNS



SCOPE OF THE STUDY

The purpose of this study is to compare three products with identical manufacturing processes but different sources of raw material. An analysis will be conducted on 1 kg (functional unit) each of:

- Virgin PET
- Post-consumer recycled PET
- Pre-consumer recycled PET

SYSTEM BOUNDARIES

A comparative Life Cycle Assessment (LCA) has been performed evaluating all the life cycle stages of each product before reaching the Antex plant gate: from raw material procurement to the factory gate, ready for distribution, also known as a cradle-to-gate assessment.

Stages included:



UPSTREAM

Production of raw materials, auxiliary materials, chemicals and packaging materials used to obtain the product.

The recycling process includes the transportation of PET bales from waste selection until the pellets are obtained.

Transportation from sorting plants to flakes processing plant to pellet processing plant.



PRODUCTION STAGE

Transportation of raw materials, auxiliary materials, chemicals and packaging materials from supplier to the production plant.

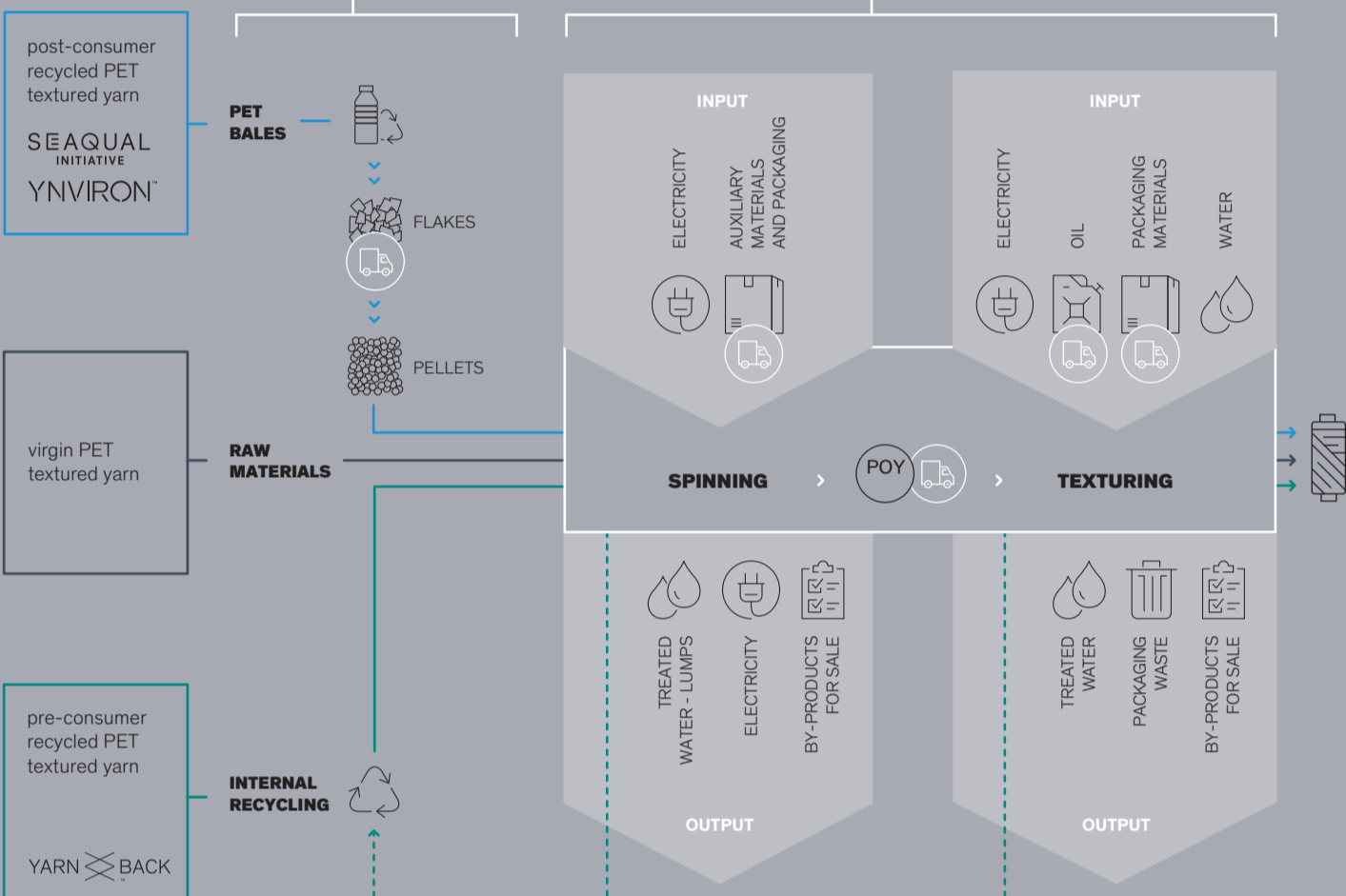
Water consumption from production processes.

Consumption of natural gas and diesel in the steaming process.

Electricity consumption from production processes.

Yarn production processes: spinning and texturing.

Wastewater treatment at own plant.



METHODOLOGY AND RESULTS

The environmental behaviour analysis of the four yarns options produced by Antex has been performed using the life cycle assessment methodology in accordance with ISO 14040 and ISO 14044, using the software Simapro v 9.1.

Another life-cycle analysis performed by Antex shows a reduction in the GHG emissions and water consumption of mass solution dyed yarn (YNMAS) versus yarn dyed with traditional methods.

Categories and indicators	Units	Virgin PET yarn	YNVIRON / SEAQUAL	YARNBACK
Global warming	kg CO ₂ eq	6.09	3.84	2.87
Water consumption	m ³	9.37E-02	6.22E-2	5.48E-2
Total energy consumption	MJ	164.15	98.58	83.56

YNVIRON: Post-consumer recycled PET yarn. SEAQUAL: Post-consumer recycled PET yarn containing sea plastic waste. YARNBACK: Pre-consumer recycled PET yarn.

BENEFITS OF OUR SUSTAINABLE PRODUCTS

Post-consumer recycled yarns YNVIRON, SEAQUAL

Reduction % vs virgin polymer

- 37% CO₂ emissions (Global warming)
- 34% Water consumption
- 40% Electricity consumption

Pre-consumer recycled yarns YARNBACK

Reduction % vs virgin polymer

- 53% CO₂ emissions (Global warming)
- 42% Water consumption
- 49% Electricity consumption

Solution dyed yarn YNMAS

Reduction % vs package dyed

- 31% CO₂ emissions (Global warming)
- 88% Water consumption

antex.net

SPAIN
T. +34 972 43 83 00
antex@antex.net

BRAZIL
T. +55 (41) 2103 8100
antexbrasil@antex.net

MEXICO
T. +52 241 4189 700
antexmexico@antex.net

