

Cost, Resale, and Recycling Case Studies: Comparative Financial Impact of the Patented Correlation Method (*HtK*) vs Tailored Cut-and-Sew

Introduction

This document presents a structured, side-by-side analysis of the economic and environmental benefits of the **Patented Correlation Method for high-tech programmable knit (*HtK*)** compared to traditional cut-and-sew woven garment production. Each section is designed to provide decision-makers, partners, and industry leaders with a clear understanding of how this technology improves profitability, circularity, and operational efficiency at scale.

Overview

Patented Correlation Method (*HtK*) introduces a fundamental transformation in garment production—creating a new category of scalable, structurally engineered apparel. It delivers both technological and environmental differentiation that traditional systems cannot match.

For the first time, two seemingly incomparable production methods are being assessed side by side:

- Self-adjusting, perfectly tailored garments produced via the Patented Method.
- High-end tailored woven garments produced through cut-and-sew methods.

This comparison has not been possible until now because the **Patented Method defines a production system that did not exist** before. Two case studies presented within the Method quantify its impact in terms of cost, yield and profit potential. By exploring both a Maximum Sustainability and a Business Optimised approach, the data demonstrates how circularity, fibre recovery and structural longevity can work within a scalable profit model.

This appendix serves as financial proof of the viability of the Method in both luxury and cost-driven applications—all based on traceable inputs and programmable garment logic. What follows is not a projection, but a proven production reality.

Key Metrics

These verified outcomes reflect the real-world implementation of the **Patented Method** at scale. Each metric represents a core area of operational and financial efficiency made possible through the system’s structural precision, fibre preservation, and self-adjusting design logic.

Metric	Outcome
Manufacturing Efficiency	+ 84.0%
Skilled Workforce Reduction	– 99.9%
Production Cost Reduction	– 73.7%
Space Efficiency	+ 99.27%
Electricity Use per Garment	– 66.7%
Warehousing Space Reduction	– 78.6%
Increase in Net Profit	+ 235 –240%

Core Highlight

At current capacity, the patented process can produce up to 197 million perfectly fitted garments a year using just 60,000 high-tech programmable machines and just 1,200 operators - replacing over 1.6 million traditional skilled tailors.

Recycling Efficiency

The Patented Method ensures garments are made from a single fibre, with no fastenings or mixed materials—making them inherently recyclable by design.

- Fibre Recovery Rate: 85%
- Waste Reduction (Fibre):
 - Up to 91.2% in the Max Circularity model (X1)
 - 84.9% in the Business-Optimised model (X2)

These high recovery rates reduce the need for virgin fibre and support both sustainability and profit—without added labour or processing steps.

Full recycling logic is covered in the dedicated circularity document. This section highlights only the key outcomes relevant to cost modelling.

Note on Fibre Type Comparison

While the Patented Method uses the highest-quality fibre with built-in recyclability and structural integrity, traditional cut-and-sew production is rarely compatible with the same sustainable fibre at scale. Therefore, comparisons in this document use conventional, commonly available materials as the cut-and-sew baseline.

This ensures a realistic reference point:

→ *If sustainable fibre were used in cut-and-sew, costs would increase disproportionately and circular recovery would remain inefficient due to construction limitations (seams, fasteners, mixed materials).*

Patented Correlation Method (HtK): Full-Cost Model (Case 1) and Cost-Recovery Model (Case 2)

Both models demonstrate an exceptionally sustainable and efficient production system, making the distinction between them more about strategic priorities than necessity. The **Case 1: Full-Cost Model (Maximum Sustainability Approach)** ensures a **maximum circular approach**, which is beneficial for brands that emphasise sustainability as a core value, while the **Case 2: Cost-Recovery Model (Business-Optimised Model)** balances sustainability with marginally higher profitability.

However, the financial difference between the two is so minimal that it questions whether fully new recycled yarn is even necessary for in-house operations. Outsourcing the recycling process, effectively purchasing a closed-loop system, could simplify operations while maintaining the same level of circularity, reducing internal management complexity. The Patented Method ensures unparalleled sustainability, regardless of whether a brand opts for direct fibre reintegration or external sourcing.

This is Not Just a Conceptual Shift—it is a Technical Inevitability.

RECOVERED FIBRE

TAILORED WITH CUT-AND-SEW, *Woven* (Y):
55%

54.5% More Efficient

Lower-quality fibres downgraded for non-luxury use. Higher sorting and pre-processing costs due to fasteners, adhesives, and blends.

RECYCLING EFFICIENCY:

Output: High-quality fibres suitable for reuse in luxury garments.

Output: Lower-quality fibres often downgraded for non-luxury use.

Key Assumptions:

- **Sorting:** €0.05 per item (minimal effort)
- **Processing:** €1.20/kg (single fiber)
- **Fibre Recovery Rate:** 85%

- **Sorting:** €0.50 per item (higher complexity)
- **Processing:** €2.50/kg (multiple materials)
- **Fibre Recovery Rate:** 55%



RECYCLING COSTS

ENGINEERED WITH THE PATENTED METHOD *HtK* (X):

$X = 0.22Y$

€1.49/kg

TAILORED WITH CUT-AND-SEW, *Woven* (Y):

Y

€6.71/kg

Cost Reduction: 77.8%

ENGINEERED WITH THE PATENTED METHOD, *HtK* (X):

- **Recovery Rate:** Up to 85-90% of fibre is recoverable due to single-fibre construction.
- **Cost Efficiency:** Lower sorting and pre-processing costs. Recycling costs focus on processing and cleaning the fibre.
- **Output:** High-quality fibres suitable for reuse in luxury garments.

Key Assumptions:

1. **Original Fibre Cost:**
 - €110/kg reflects a premium price for the highest quality, long-fibre yarn
2. **Recycling Efficiency:**
 - Recovery Rate: 85-90%.
 - Recycled Fiber Quality: Comparable to the original due to the clean, single-fibre design
3. **Recycled Fibre Usage:**
 - Recycled fibre can make up 25–30% of the total material without compromising quality
4. **Processing:** €1.20/kg (single fibre)

Recycling Cost Calculations:

- **Handling Postage etc Fees:** €50 (buffer for handling, quality checks, minor adjustments, etc.)
- **Recycling Cost Per Garment: €0.47**
 - Sorting: €0.05
 - Processing: $0.35\text{ kg} \times €1.20/\text{kg} = €0.42$
- **Recovered Fibre:** $0.35\text{ kg} \times 90\% = 0.315\text{ kg}$
- **Cost Per Recovered Kg:** $€0.47 \div 0.315\text{ kg} = €1.49/\text{kg}$

TAILORED WITH CUT-AND-SEW, *Woven* (Y):

- **Recovery Rate:** 50-60% due to mixed materials and contamination.
- **Cost Efficiency:** Higher sorting and pre-processing costs due to fasteners, adhesives, and multi-material blends.
- **Output:** Lower-quality fibres often downgraded for non-luxury use.

Key Assumptions:

1. **Original Material Cost per Garment:**
 - €90 reflects a premium price for the highest quality
2. **Recycling Efficiency:**
 - Recovery Rate: 55%.
 - Recycled Fibre Quality: not suitable for luxury use at high rate due to mixed dyes, fragile original fibres.
3. **Processing:** €2.50/kg

Recycling Cost Calculations:

- **Handling Postage etc Fees:** €50 (buffer for handling, quality checks, minor adjustments, etc.)
- **Recycling Cost Per Garment: €1.55**
 - Sorting: €0.50
 - Processing: $0.42\text{ kg} \times €2.50/\text{kg} = €1.05$
- **Recovered Fibre:** $0.42\text{ kg} \times 55\% = 0.231\text{ kg}$
- **Cost Per Recovered Kg:** $€1.55 \div 0.231\text{ kg} = €6.71/\text{kg}$

RESALE

(Net Profit per Garment)

ENGINEERED WITH THE PATENTED METHOD *HtK* (X):

TAILORED WITH CUT-AND-SEW, *Woven* (Y):

Case Study 1: Maximum Sustainability Approach: $X1 = €423.6 = 3.39Y$

$Y = €125.00$

Case Study 2: Business-Optimised Model $X2 = €425.9 = 3.41Y$

Increase in Net Profit: 235-240%

The Patented Method (*HtK*) delivers 235-245% higher net profit per garment (€424-426 vs. €125.00) compared to cut-and-sew garments, which have high production and resale costs, making multiple resale cycles financially unviable. A high-end cut-and-sew garment incurs resale costs of €150 - including handling, repairs and logistics - while the patented process reduces this to around €79-€89. In addition, the production cost of a premium made-to-measure garment is €380 per garment, while the patented process achieves the same high quality output for just €100 per garment.

Unlike traditional garments, which lose value with each resale, the self-adjusting structure of garments produced using the patented process ensures consistent fit and integrity, eliminating the need for alterations.

By eliminating size fragmentation, reducing unsold inventory and enabling continuous resale, the Patented Method transforms circularity into a scalable, high-margin business model. By comparison, traditional high-end cut-and-sew methods cannot compete due to costly alterations and rigid sizing structures that create a resale bottleneck, ultimately limiting profitability.

For a detailed financial breakdown, please refer to the **Two Case Studies** following the **TAILORED WITH CUT-AND-SEW (*Woven*)** section, which outline different approaches to recycling and resale of garments **ENGINEERED WITH THE PATENTED METHOD (*HtK*)**.

TAILORED WITH CUT-AND-SEW *Woven* (Y):

There are critical differences to consider: Resale Costs €150 per Resold Item:

- Handling & Quality Checks – €50 per returned per garment
- Refurbishment & Repairs – €60 (*mending, alterations, pressing*)
- Repackaging & Logistics – €20 (*re-tagging, folding, pressing, and repackaging*)
- Storage & Inventory Management – €20 (*size-based storage, increased logistics costs*)

Key Assumptions:

- **First Sale Revenue:** $€700 \times (70\% \text{ of garments sold directly}) = €490$ per garment
- **Resale Revenue:** $€250 \times (30\% \text{ of garments returned} \times 50\% \text{ of garments resold}) = €37.5$ per garment
- **Recycling Fibre Contribution:** Negligible due to mixed materials and inefficiencies. Assume €0
- **Production Cost:** €380 per garment (*including materials*)

Net Profit per Garment:

- **Resale Cost Allocation:** $€150 \times (30\% \text{ of garments returned} \times 50\% \text{ of garments resold}) = €22.5$ per garment (*averaged across total production*)
- **Total Cost per Garment:** $€380 + €22.5 = €403$
- **Net Profit per Garment:** $€528 \text{ (revenue)} - €403 \text{ (costs)} = €125.00$

CASE STUDIES
THE PATENTED
CORRELATION
METHOD (HtK)

Case Study 1 (X1): Maximum
Sustainability Approach (Full
Cost Applied)

- **Objective:** Prioritise sustainability and circularity, regardless of cost efficiency.
 - **Recycled Fibre Cost:** Considered as a new material purchase (€111.5/kg).
 - **Material Cost per Garment:** €38.7 per garment.
 - **Financial Impact:** Slight cost increase (+€0.16 per garment).
 - **Justification:** This model ensures maximum **circular fibre use**, eliminating reliance on virgin fibre as much as possible.
- Strategic Advantages:**
- Strengthens brand sustainability credentials.
 - **Fully circular**, minimising reliance on raw fibre extraction.
 - Ideal for **luxury & premium brands** where sustainability outweighs minor cost concerns.

Case Study 2 (X2): Business-
Optimised Model (Cost Offset
Applied)

- **Objective:** Leverage fibre recovery to optimise costs while maintaining sustainability.
 - **Recycled Fiber Cost**
Adjustment: Instead of repurchasing, recovered fibre (€93.5/kg) offsets the original cost.
 - **True Additional Cost per kg of Recycled Fibre:** €18/kg (only the processing cost + small loss from fibre breakdown).
 - **Material Cost per Garment (Adjusted):** €28.9 per garment (vs. €38.7 in Case Study 1).
 - **Financial Impact:** Significantly lower per-unit cost while keeping circularity intact.
- Strategic Advantages:**
- Maximises profitability without compromising sustainability.
 - Reduces cost per garment, **improving pricing competitiveness.**
 - Scalable for mid-to-large production volumes **without financial burden.**

NOTE: All calculations are performed with full precision, but for consistency in presentation, values are generally rounded to one decimal place. For minor figures (e.g., below €1), rounding is applied to two decimal places where necessary to ensure accuracy in cumulative totals. For larger financial values, rounding is maintained to one decimal place unless greater precision is required. Summed totals are only adjusted at the final stage to avoid discrepancies caused by intermediate rounding.

STEP 1: FIBRE COMPOSITION

Total Fibre Required per Garment:	0.35 kg	0.35 kg
Recycled Fibre Contribution:	30% (0.105 kg)	30% (0.105 kg)
Virgin Fibre Contribution:	70% (0.245 kg)	70% (0.245 kg)

STEP 2: MATERIAL COSTS

Virgin Fibre Cost:	€110/kg (reflects a premium price for the highest quality, long-fibre yarn)	€110/kg (reflects a premium price for the highest quality, long-fibre yarn)
Recovery Rate:	85% of fibre is retained after recycling	85% of fibre is retained after recycling
Recycling Processing Cost:	€1.49/kg	€1.49/kg
Cost of Recycled Fibre per Kg:	€110/kg + €1.49/kg = €111.5/kg	Recovered Value: 0.85% × €110/kg = €93.5/kg
True Additional Cost of Recycled Fiber:	€111.5/kg (considered as new fibre purchase)	(€110 + €1.49) – €93.5/kg = €18/kg
Virgin Fibre Cost per Garment:	0.245 kg × €110/kg = €26.9	0.245 kg × €110/kg = €27
Recycled Fibre Cost per Garment:	0.105 kg × €111.5/kg = €11.7	0.105 kg × €18/kg = €1.9
Total Material Cost per Garment:	€11.7 + €27 = €38.7	€1.9 + €27 = €28.9

STEP 3: COST IMPACT OF WITH RECYCLED FIBRE

Original Fibre Cost (100% virgin):	0.35 kg × €110/kg = €38.5	0.35 kg × €110/kg = €38.5
New Fibre Cost (30% recycled):	€38.7	€28.8
Cost Impact Due to Recycled Fibre:	€38.7 - €38.5 = €0.16 (slight increase in cost)	€38.5 - €28.8 = €9.7 (significant savings)

STEP 4: ASSUMPTIONS FOR COMPARISON

Retail Price:	€700 first sale	€700 first sale
Original Production Costs with Virgin Fibre:	n/a	n/a

Resale Price:	€250	€250
Return Rates & Split:	30% of all garments returned: 50% for resale and 50% for recycling	30% of all garments returned: 50% for resale and 50% for recycling
Resale Costs*:	€50 + €33.7 = €88.7	€50+€28.8 = €78.8
Recycling Costs & Contribution:	€11.7 value per garment (recycled fibre)	€1.9 value per garment (recycled fibre)

STEP 5: REVENUE & COST ANALYSIS PER GARMENT

First Sale Revenue:	$€700 \times (70\% \text{ of garments sold directly}) = \text{€490}$	$€700 \times (70\% \text{ of garments sold directly}) = \text{€490}$
Resale Revenue:	$€250 \times (30\% \text{ of garments returned} \times 50\% \text{ of garments resold}) = \text{€37.5}$	$€250 \times (30\% \text{ of garments returned} \times 50\% \text{ of garments resold}) = \text{€37.5}$
Recycling Contribution:	$€11.7 \times (30\% \text{ of garments returned} \times 50\% \text{ of garments recycled}) = \text{€1.8}$	$€1.9 \times (30\% \text{ of garments returned} \times 50\% \text{ of garments recycled}) = \text{€0.28}$
Total Revenue per Garment:	$€490 + €37.5 + €1.8 = \text{€529.3}$	$€490 + €37.5 + €0.28 + €1.9 = \text{€529.4}$
Resale Cost Allocation**:	$€88.7 \times (30\% \text{ of garments returned} \times 50\% \text{ of garments resold}) = \text{€13.3}$ per garment (averaged across total production)	$€78.9 \times (30\% \text{ of garments returned} \times 50\% \text{ of garments resold}) = \text{€11.8}$ per garment (averaged across total production)
Total Cost per Garment:	$€100 + €13.3 - €1.8 = \text{€111.5}$	$€100 + €11.8 - €0.28 - €9.7 = \text{€101.9}$
Net Profit per Garment:	$€529.3 - €111.5 = \text{€417.7}$	$€529.4 - €101.9 = \text{€427.5}$

STEP 6: INCORPORATING RECYCLED FIBRE

Return Rate:	30% of garments returned $\times$ 50% of garments recycled = 15% of total garments recycled annually	30% of garments returned $\times$ 50% of garments recycled = 15% of total garments recycled annually
Average per Production: Distributed Across Production:	0.35 kg per garment $\times$ 15% of garments recycled = 0.0525 kg of recycled yarn per garment produced	0.35 kg per garment $\times$ 15% of garments recycled = 0.0525 kg of recycled yarn per garment produced
Value of Recycled Fibre:	0.0525 kg $\times$ €111.5/kg = €5.9 of recycled yarn value per garment	0.0525 kg $\times$ €18/kg = €0.94 of recycled yarn value per garment

STEP 7: COST PER GARMENT

Original Production Cost: €100/Garment:	n/a	n/a
Resale Costs Averaged Across Production:	€13.3	€11.8
Recycling Contribution Deduction:	- €1.8 (offsets cost)	- €0.28 (offsets cost)
Future Fibre Contribution Deduction:	- €5.9 (from recovered fibre)	- €9.7 (from recovered fibre)
Total Adjusted Cost per Garment***:	$€100 + €13.3 - €1.8 - €5.9 = \text{€105.7}$	$€100 + €11.8 - €0.28 - €9.7 = \text{€101.9}$

STEP 8: NET PROFIT PER GARMENT

Total Revenue per Garment:	$€490 + €37.5 + €1.8 = \text{€529.3}$	$€490 + €37.5 + €0.28 = \text{€527.8}$
NET Profit:	$€529.3 - €105.7 = \text{€423.6}$	$€527.8 - €101.9 = \text{€425.9}$

* UNDERSTANDING THE COST BREAKDOWN IN THE RESALE & RECYCLING MODEL

- 1. Handling & Processing Returns (€50 per returned item):** This applies **every time a return happens**, whether for resale or recycling. Since the model assumes multiple resale cycles, these costs continue to apply for every resale. The €88.7 figure reflects the long-term resale processing costs for garments that continue through multiple returns and resales over time. Each time a garment is returned, it incurs a **fixed handling fee of €50**, covering:
 - Quality checks
 - Minor adjustments
 - Packaging & postage
- 2. Material Cost Per New Garment €38.7 per item, (Case 1):** Each new garment to be produced with the Patented Method composition: **30% recycled fiber and 70% virgin fibre**, reducing reliance on virgin materials to ensure that returns and recycling actively reduce future material costs.
The cost breakdown:
 - **Recycled Fibre Cost:** €11.7 per garment
 - **Virgin Fibre Cost:** €27 per garment
 - **Total Material Cost:** €38.7 per garment
- 3. Resale Costs €88.7 per Resold Garment:** When a returned garment is deemed fit for resale, additional costs apply to **prepare it for a second sale**:
 - Handling, cleaning, and quality checks
 - Storage & logistics for resale
 - Repackaging and remarketing

Why This Matters

- **Circular Efficiency:** This model allows garments to be **resold multiple times** before they eventually go into recycling.
- **Lower Long-Term Costs:** Each resale cycle **reduces the need for new materials**, leading to greater cost savings over time.
- **Sustainability & Profitability Combined:** The structured returns, resale, and recycling system **balances sustainability with financial efficiency**.

** **RESALE COST ALLOCATION:** €13.3 per garment averaged across total production (Case 1)

The **€13.3 per garment** is an **averaged cost applied across all garments in the system**, regardless of whether they are sold, resold, or never returned. It represents the overall impact of resale costs across the entire production volume.

- | | |
|---|--|
| 1. Total Returns & Resale Rate: <ul style="list-style-type: none">• 30% of all garments sold are returned.• Of those returned garments, 50% are resold, and 50% are recycled.• This means only 15% of all garments sold are resold: $30\% \times 50\% = 15\%$ | 2. The Actual Resale Cost: <ul style="list-style-type: none">• Each resold garment incurs a cost of €88.7.• Since only 15% of garments in circulation go through resale, the total resale cost is spread across all garments.• The formula used: $€88.7 \times 15\% = €13.3$ |
|---|--|

What This Means

- The €13.3 cost applies to every garment produced not just those resold.
- It is part of the overall business model, not tied to individual sales cycles or how often resale happens.

Even if a specific garment is never returned or resold, it still carries this cost as part of the company's operational structure.

*** **TOTAL ADJUSTED COST PER GARMENT -€9.7.**

The €9.7 deduction in Case 2 reflects the total cost offset from recovered fibre, including the €0.94 material value per garment. This figure represents the full saving achieved by fibre reuse and processing cost avoidance.

OPTIMISED RECYCLED FIBRE STRATEGY

Although garments can maintain an authentic look with up to **30% recycled fibre**, this level is reserved for future scalability. In the initial stages, with **30% of garments returned (15% for resale, 15% for recycling)**, the most viable approach is to **incorporate 12.75% recycled fibre** across all garments.

Strategic Benefits of Incorporating 12.75% Recycled Fibre:

- **Immediate Circularity** – Enables full production coverage from the first cycle, eliminating virgin fibre reliance once returns reach 15%.
- **Scalable Model** – As return rates grow, recycled fibre incorporation can gradually increase to **30%**.
- **Consumer Engagement** – Encourages garment returns, reducing waste while enhancing sustainability.
- **Balanced Efficiency & Quality** – Ensures product integrity with minimal cost impact (0.41% increase at 30%).

Long-Term Cost Stability & Business Advantages:

- 1. Predictable Material Costs** – Stable fibre pricing minimises exposure to market fluctuations.
- 2. Inflation & Supply Chain Protection** – Reduces dependence on virgin materials, mitigating risk.
- 3. Stronger Profit Margins** – Scaling recycled fibre use keeps costs low without affecting profitability.
- 4. Efficient Circular Flow** – Prevents material shortages while ensuring continuous production.

This model ensures a **future-proof, sustainable production system** with minimal financial risk while maintaining high-quality, scalable operations.

How The Patented Correlation Method (*HtK*) Is Financially and Sustainably Superior To Traditional Tailored Cut-and-Sew (*Woven*) Production Methods.

1. COST STABILITY & PREDICTABILITY

- **ENGINEERED WITH THE PATENTED METHOD, *HtK* (X):**
 - **Efficient production time:** 2,4h, fully automated process.
 - **Streamlined production costs:** €100.
 - **Material costs remain stable:** €38.5 - €28.8 per garment, even with up to 30% recycled fibre.
 - **Case 1 – Minimal cost increase:** only €0.16 per garment, (+0.41%), **ensuring long-term cost stability.**
 - **Case 2 – Significant savings:** €9.7 per garment saved (–25.2%), **ensuring profitability while maintaining sustainability.**
 - **Self-adjustment:** Enables predictably lower sales returns and size-related inefficiencies.
 - **Predictable pricing:** Shields production from market volatility in raw material costs.
 - **Recycled fibre maintains luxury quality:** Maintains luxury standards, avoiding degradation and the volatility of mixed-material waste.
- **TAILORED WITH CUT-AND-SEW, *Woven* (Y):**
 - **High production time:** 15h per garment.
 - **High production costs:** €380 per garment, driven by fabric inefficiencies and labour-intensive production.
 - **No stable recycling model:** Increases cost uncertainty.
 - **Highly dependent on skilled labour:** Skilled workforce required, adding operational and cost volatility.

2. PROFITABILITY:

- **ENGINEERED WITH THE PATENTED METHOD, *HtK* (X):**
 - **First Sale Revenue per Garment:** €490 (after factoring in 70% direct sales).
 - **Resale Revenue per Garment:** €37.5 (after factoring in 30% returns, 50% resold).
 - **Recycling Contribution:** €1.8 per garment, *Case Study 1* (30% returns × 50% recycled).
 - **Total Revenue per Garment:** ≈ €528
 - **Final Cost per Garment:** €102- €106 (factoring in resale costs and the recycling contribution).
 - **Net Profit per Garment:** ≈ €425 (average between Case Studies)
- **TAILORED WITH CUT-AND-SEW, *Woven* (Y):**
 - **First Sale Revenue per Garment:** €490.0
 - **Resale Revenue per Garment:** €37.5
 - **Recycling Contribution:** €0 (negligible due to mixed materials)
 - **Total Cost per Garment:** €403
 - **Net Profit per Garment:** €125

The production of tailored garments engineered with **THE PATENTED METHOD, *HtK* (X)** generates **235%-245% higher profit per garment** (≈€425 vs. €125). Production of tailored garments **TAILORED WITH CUT-AND-SEW, *Woven* (Y)** runs on lower margins and is not financially scalable due to high production and refurbishment costs.

3. SUSTAINABILITY & CIRCULAR MODEL EFFICIENCY

- **ENGINEERED WITH THE PATENTED METHOD, *HtK* (X): A Closed-Loop Model**
 - **30% recycled fibre incorporation is cost-neutral** (€0.16 increase per garment, *Case Study I*).
 - **Up to 85-90% material recovery** ensures minimal waste.
 - **15% of garments returned annually support long-term recycling goals.**
 - **No mixed materials → High-quality fibre retention** for future production.
 - **Each resale cycle extends the life of the garment without adding major costs.**
- **TAILORED WITH CUT-AND-SEW, *Woven* (Y): Limited Sustainability**
 - **High material waste** from cutting patterns.
 - **Difficult to recycle** due to **mixed fibre blends**.
 - **Shorter garment lifecycle**, requiring costly repairs or rework for resale.
 - **No structured recycling contribution**, meaning future costs do not decrease.

4. FEASIBILITY AT SCALE

- **ENGINEERED WITH THE PATENTED METHOD, *HtK* (X):**
 - **Low production labour requirements** – Only machine programming and finishing required.
 - **Scalable to mass production** without increased labour costs.
 - **Minimal material waste (single-fibre design supports near 100% recyclability).**
 - **Higher resale efficiency and sustainable production flow.**
- **TAILORED WITH CUT-AND-SEW, *Woven* (Y):**
 - **High labour dependency** – Skilled tailors are required for every step in the production process.
 - **Longer production times** – High-end tailored garments require multiple processes.
 - **Lower recycling efficiency** – Cannot scale circularity at a viable cost.

5. LONG-TERM BUSINESS CASE FOR THE PATENTED CORRELATION METHOD (*HtK*) MODEL

- **Stable long-term production costs** – Even with up to **30% recycled fibre, and adoption of a Maximum Sustainability Approach (Case 1) cost increase remains negligible** (€0.16 per garment, 0.41%).
- **Highly profitable resale system** – Efficient handling of returns minimises financial loss.
- **Scalability without waste** – The system runs efficiently **at scale**, with **predictable fibre recovery ensuring long-term cost savings**.
- **Environmental compliance & brand advantage** – A strong circularity model that meets growing sustainability.
- **Stronger customer engagement** – Encourages customers to return garments, improving return rates and increasing future recycled fibre usage.

TABLE 1: Final Comparison Case 1 And Case 2 Cost Models Patented Correlation Method (HtK)

METRIC	CASE STUDY 1 (X1) MAXIMUM SUSTAINABILITY	CASE STUDY 2 (X2) BUSINESS-OPTIMISED
Objective:	Full circularity, sustainability first	Maximise profit while maintaining circularity
Recycled Fibre Handling:	Treated as a new material purchase (€111.5/kg)	Recovery offset applied (€18/kg true cost)
Virgin Fibre Use:	70% (0.245 kg)	70% (0.245 kg)
Recycled Fibre Use:	30% (0.105 kg)	30% (0.105 kg)
Material Cost per Garment:	€38.7	€28.9
Compared to 100% Virgin Fibre:	+ €0.16 per garment	- €9.7 per garment
Strategic Advantage:	Ideal for luxury/premium positioning	Ideal for large-scale, cost-sensitive models
Fibre Recovery Efficiency:	85%	85%
Fibre Waste Reduction:	Up to 91.2%	Up to 84.9%

TABLE 2: Final Comparison Patented Correlation Method (HtK) vs Tailored With Cut-And-Sew (Woven)

METRIC	PATENTED CORRELATION METHOD, HtK (X)	TAILORED CUT-AND-SEW, Woven (Y)
Production Cost per Garment:	€105.7 (with resale/recycling)	€402.50
Net Profit per Garment:	€423.6-€425.9	€125.00
Material Waste:	Minimal (single-fibre, 85% recovery)	High (cutting waste, mixed fibres)
Recycling Efficiency:	Closed-loop, 30% incorporation possible	Difficult, limited fibre recovery
Resale Model:	Efficient, €88.66 per item processing cost	Expensive, €150 per item processing cost
Labour Dependency:	Low, machine-based production	High, requires skilled tailors
Scalability:	Easily scalable without cost spikes	Difficult due to labour and inefficiency

Conclusion

The Patented Correlation Method (HtK) outperforms Tailored Cut-and-Sew (Woven) model for fitted apparel production at mass scale across every key metric evaluated. This comparison covered all critical aspects of production, material use, scalability, resale, and recycling.

The Patented Method is the only proven system that combines perfect fit, mass-market scalability, and circular profitability—establishing a future-proof resale model unmatched by any existing production method.

APPAREL MANUFACTURING INNOVATION: ENGINEERING & COMPUTER SCIENCE/APPAREL & TEXTILE ENGINEERING/GARMENTS

