Revision of European Ecolabel Criteria for Textile products

Second Ad-Hoc Working Group meeting

26th-27th September 2012, Brussels

Joint Research Centre, Institute for Prospective Technological Studies

IE – Petten, The Netherlands
Institute for Energy

IRMM – Geel, Belgium
Institute for Reference Materials and Measurements

ITU – Karlsruhe, Germany
Institute for Transuranium Elements

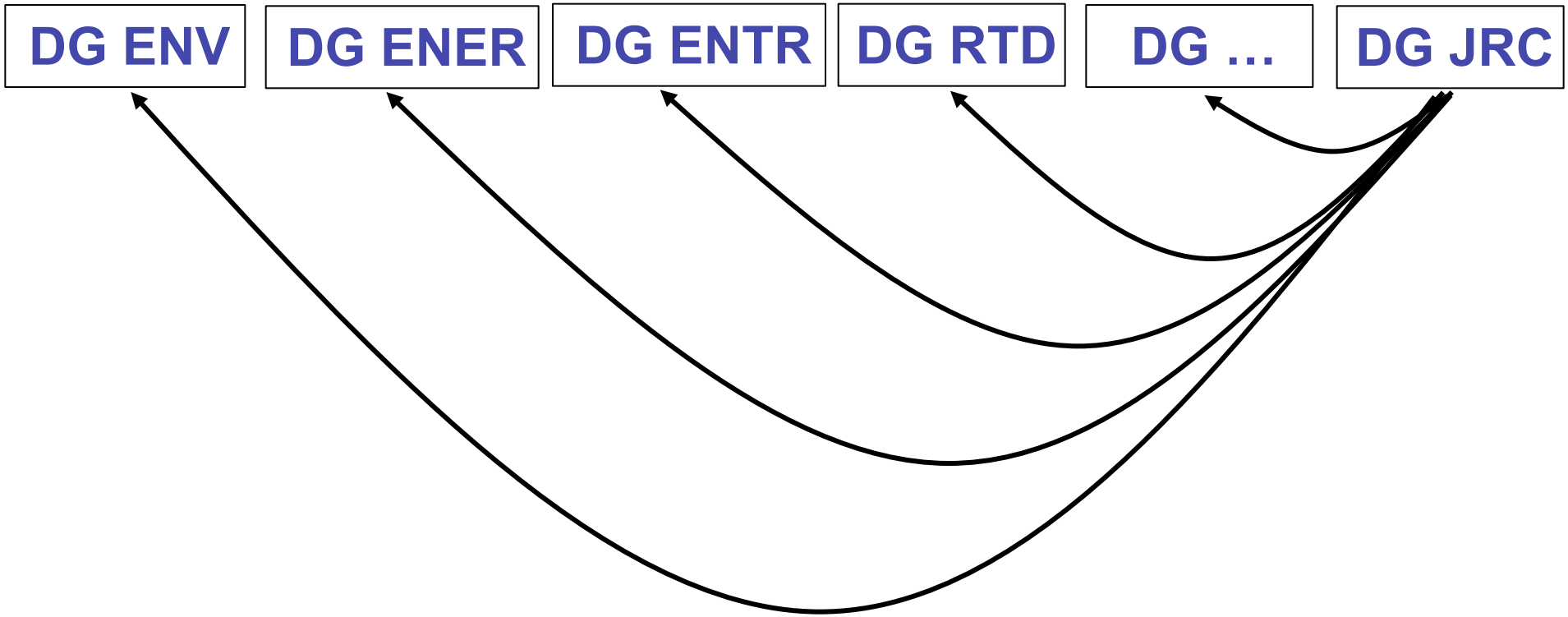
IES/ IHCP/ IPSC – Ispra, Italy
Institute for Environment and Sustainability

Institute for Health and Consumer Protection

Institute for the Protection and Security of the Citizen

IPTS – Sevilla, Spain
Institute for Prospective Technological Studies

Joint Research Centre in the context of the European Commission:



Activities in support of Product Policy

*IPTS supports the **development and implementation of environmental product policies**, amongst them the EU Ecolabel Regulation.*

*Analysis of each product group with focus on **techno economic** and **environmental** aspects*

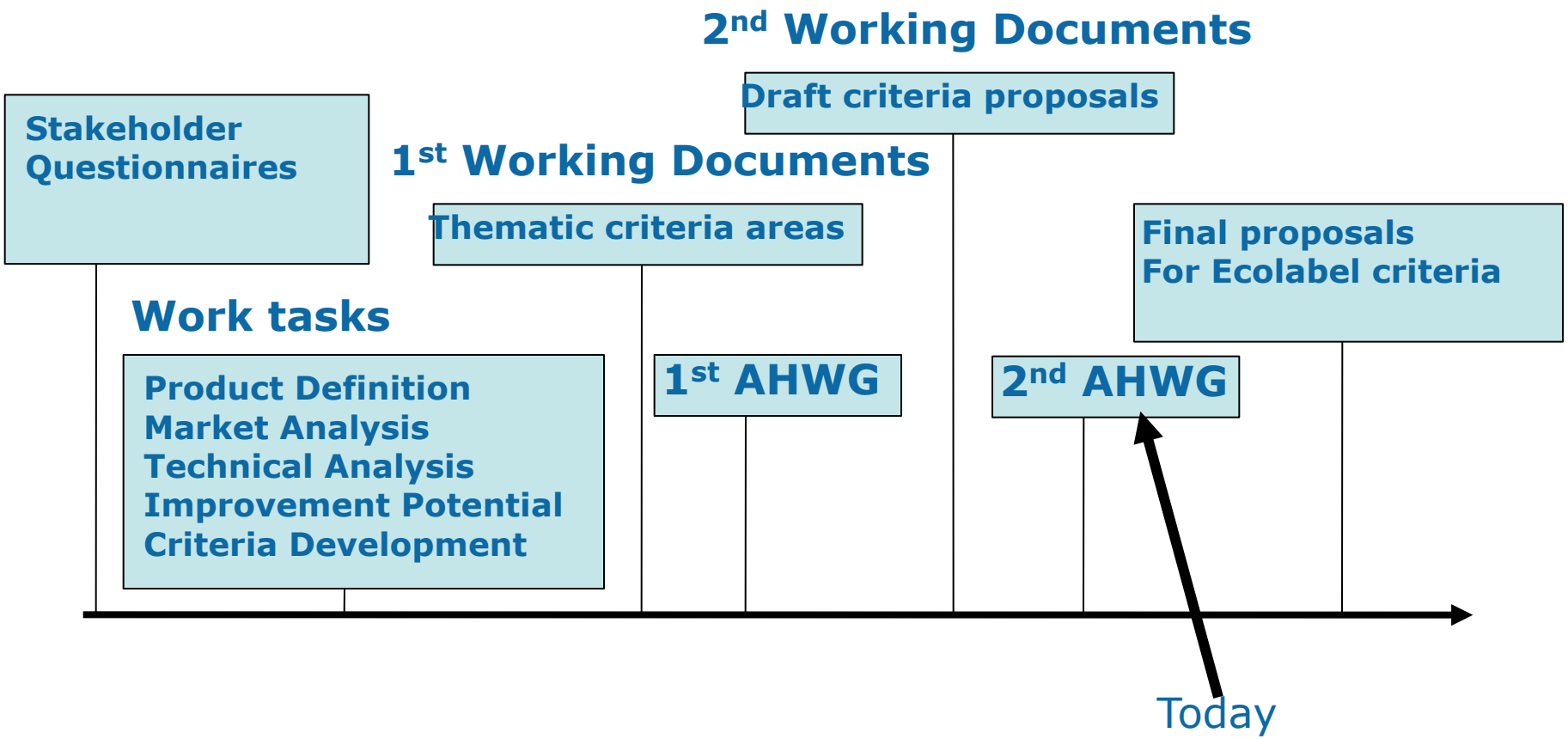
*Develop **criteria and implementing measures until the stage of adoption** with input from stakeholders*

EU Ecolabel

Regulation (EC) No 66/2010 on the EU Ecolabel

- A voluntary market instrument
- Criteria should be designed to reflect and to recognise the best performing products in the market.
- The focus shall be on the most significant environmental impacts and the proposed criteria shall be science based and based on a whole life cycle approach.

Criteria development process



Today's 2nd AHWG

Aim: To discuss, obtain feedback and seek consensus on the detail of the draft criteria proposals

- *Revised **technical background** to criteria development*
- *Discussion of **revised criteria proposals** one by one*
- ***Questions and requests for input** from stakeholders*
- ***Criteria will be updated based on input and discussions***

Meeting will be minuted according to 'Chatham House' rules

Structure of the AHWG

Day one

- Product group definition
- Assessment and verification
- Fibre criteria

Day two

- Chemicals and process criteria
- Fitness for use criteria
- Proposed new criteria

Criteria development process for textiles

1. ***Stakeholders can provide comments*** *on working document up to 2 weeks after the meeting (**11th October 2012**)*

2. ***Draft final criteria proposals*** *will be prepared and published ahead of next EUEB meeting (November 2012)*

3. *Again **4 weeks to comment** on draft final criteria proposals*

4. *Draft final criteria proposals submitted for **interservices consultation** (December 2012)*

5. ***EUEB vote*** *on final criteria set (March 2013)*

Minutes and background documents

Published on the dedicated website:

http://susproc.jrc.ec.europa.eu/ecotextiles/

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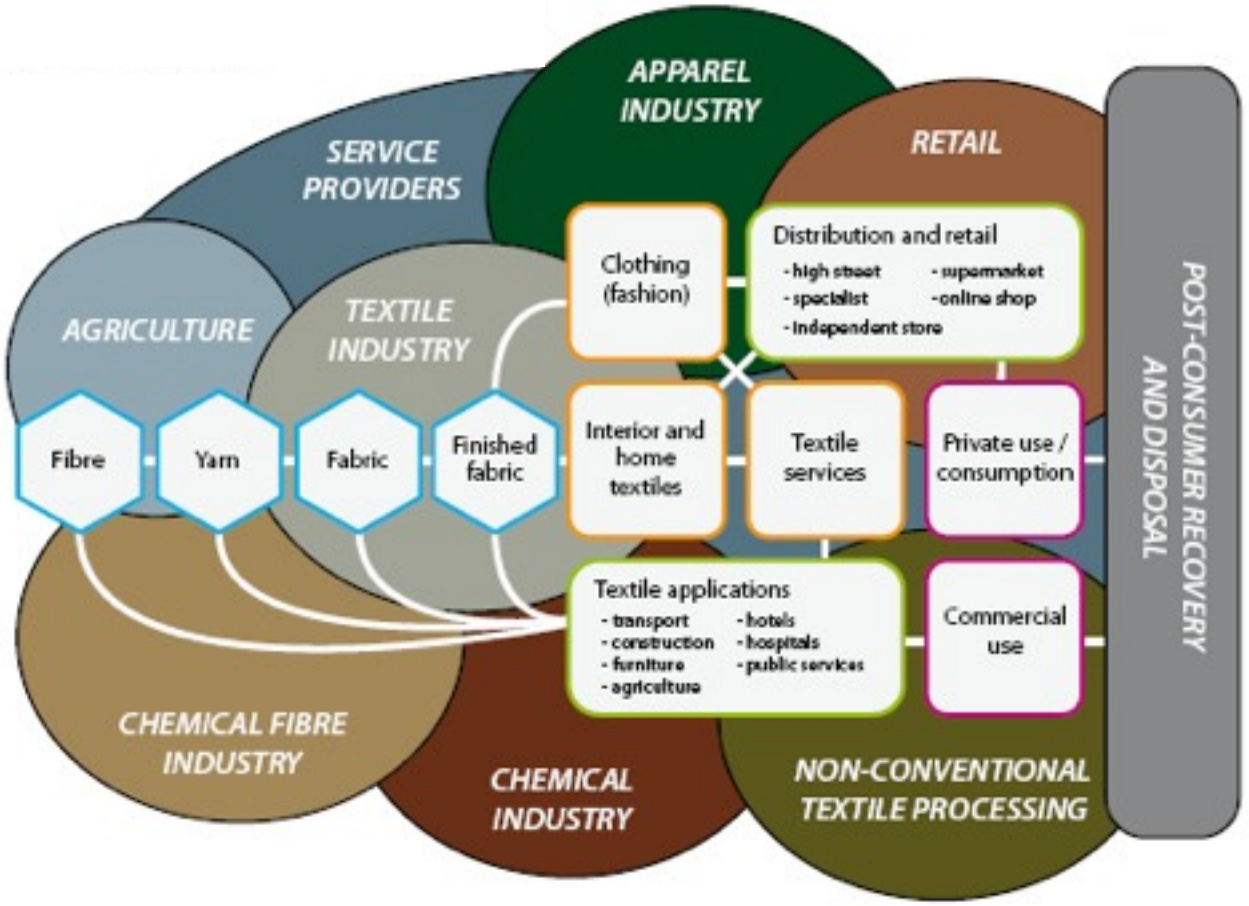
Introduction and background to the product

26th-27th September 2012, Brussels

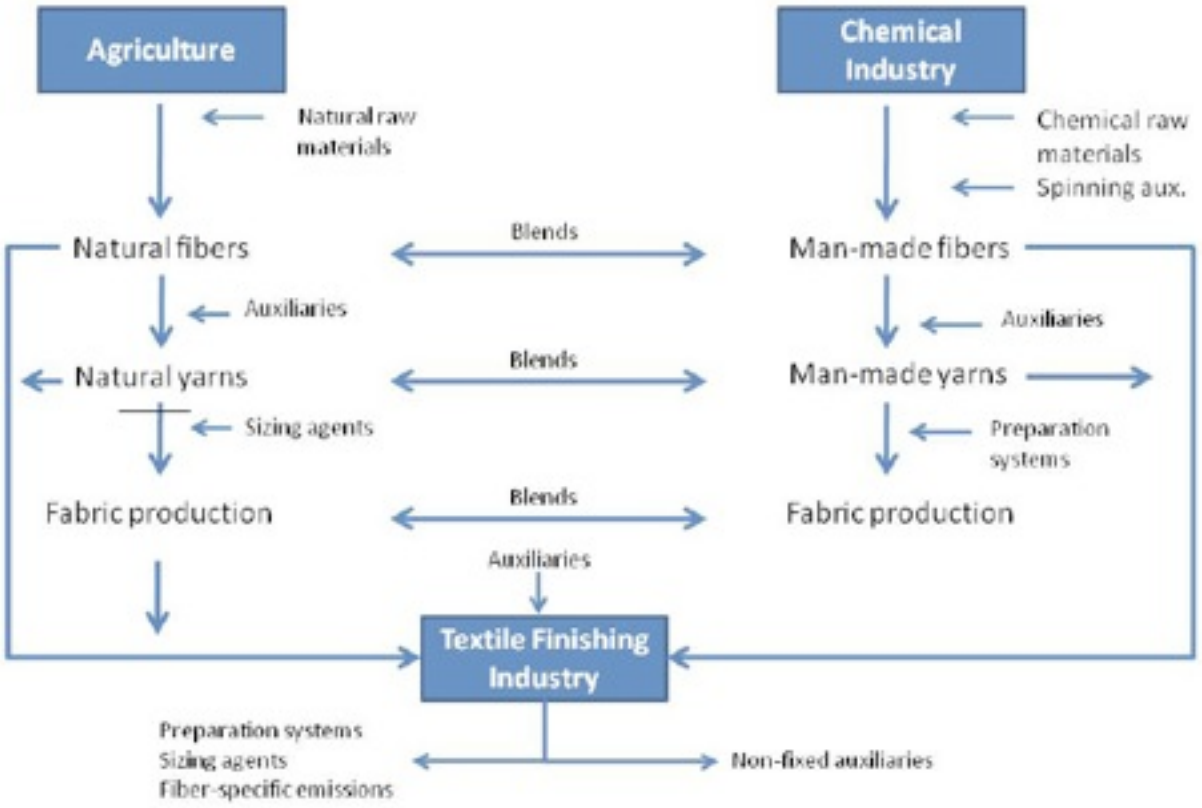
Joint Research Centre, Institute for Prospective Technological Studies

Textile product system

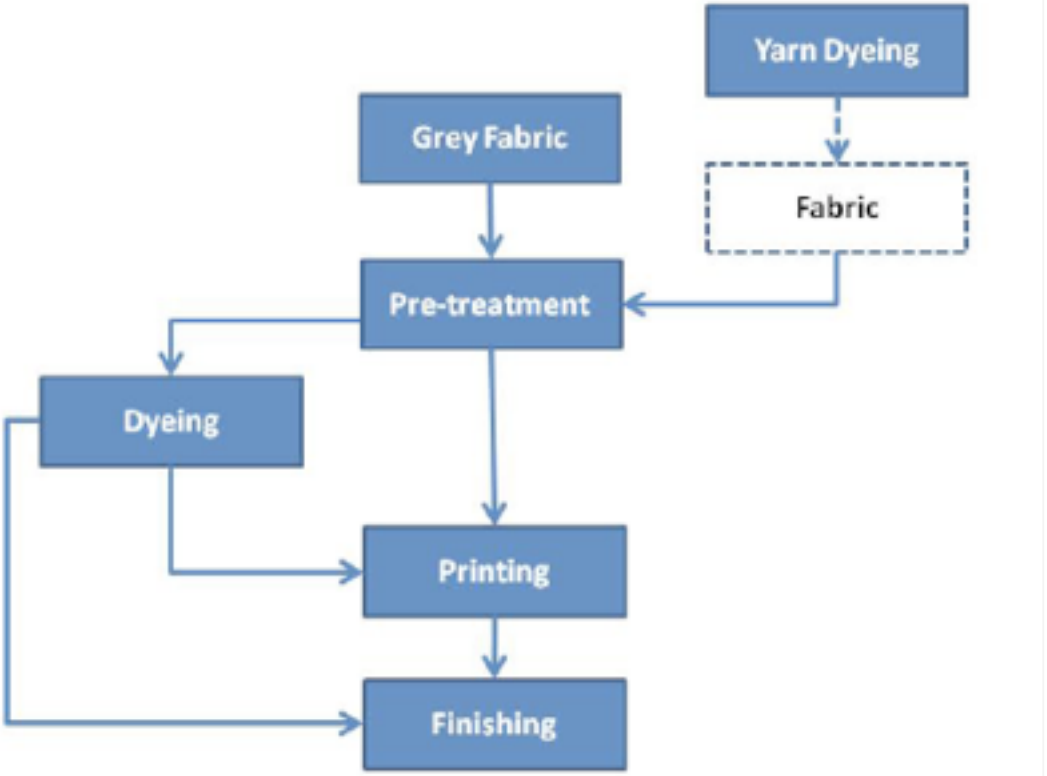


Source: Euratex – A vision for 2020, Dec 2004

Feedstocks, fibre, yarn and fabric



Dyeing, printing and finishing



Current scope, aim and structure

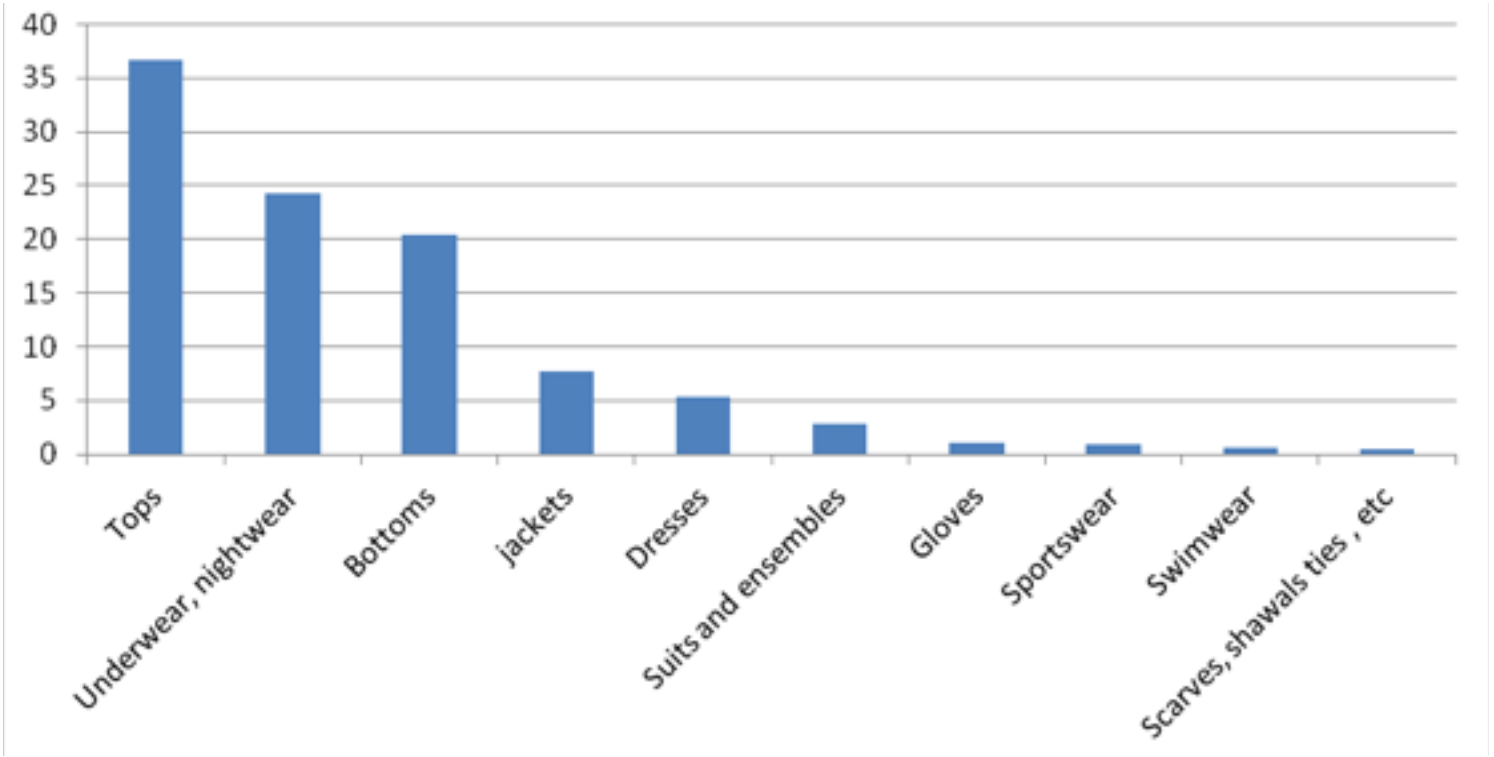
'[the promotion of] the reduction of water pollution related to the key processes throughout the textile manufacturing chain, including fibre production, spinning, weaving, knitting, bleaching, dyeing and finishing.'

- Textile fibre criteria (9 criteria)
- Processes and chemicals criteria (24 criteria)
- Fitness for use criteria (7 criteria)

Structure of the market
Production and consumption (2010)

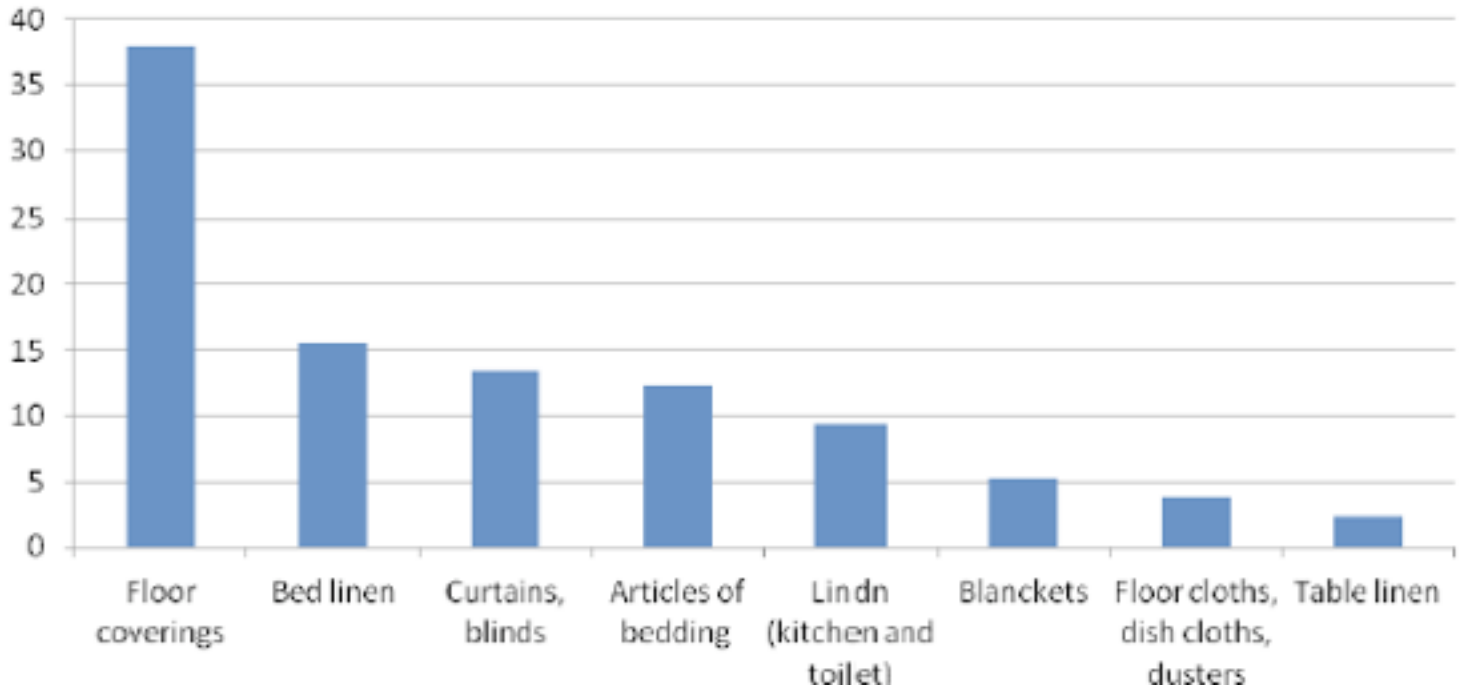
Product types	Production in EU27 - Value (2010)			Apparent consumption in EU27 – Value (2010)		
	1000 mil. Euro	%	Growth rate/year	1000 mil. Euro	%	Growth rate/year
Textile clothing and accessories	39.4	53%	-10%	87.5	71%	-2%
Interior textiles	5.8	8%	-2%	9.9	8%	0%
Fibres, yarn and fabric	29.8	40%	-8%	26.3	21%	-6%
Total	**75.0**	**100%**	**-8%**	**123.8**	**100%**	**-3%**

Three main product market segments
Clothing and accessories



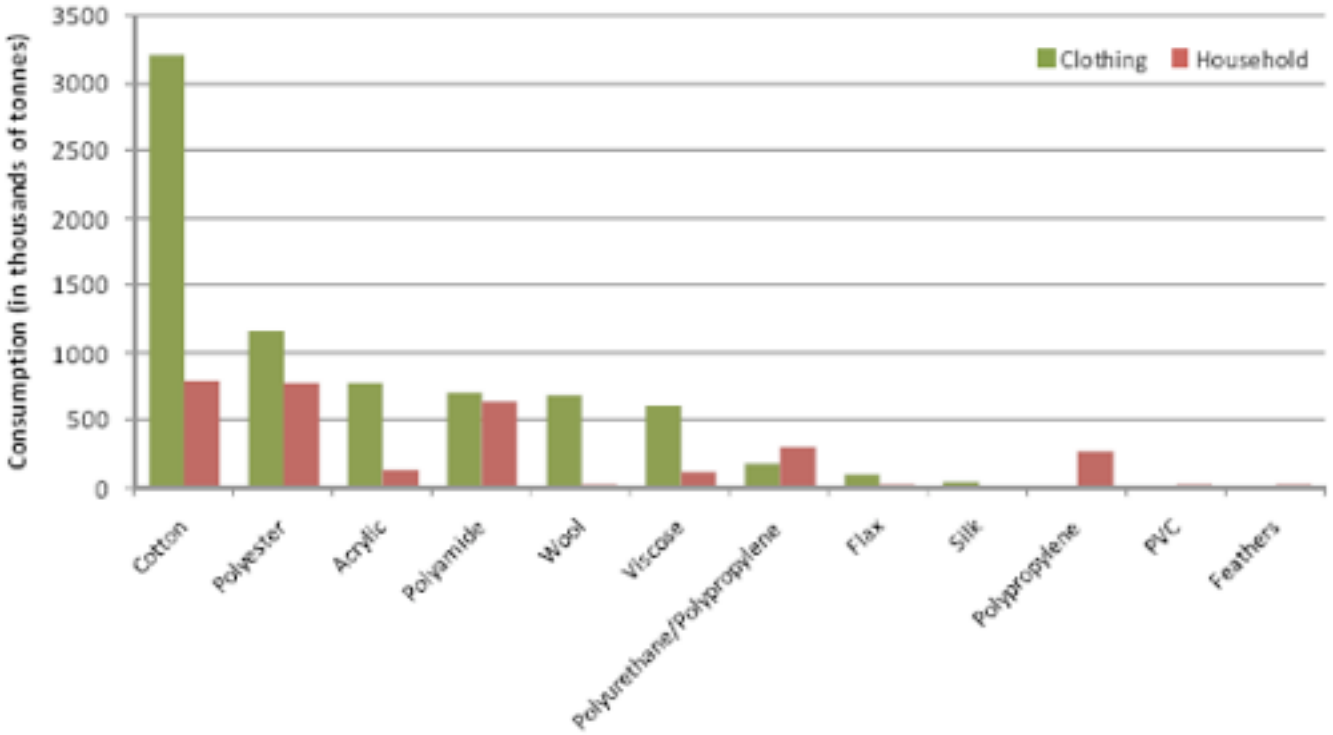
Consumption share for clothing textile products [%], [IMPRO, 2009]

Three main product market segments
Interior products



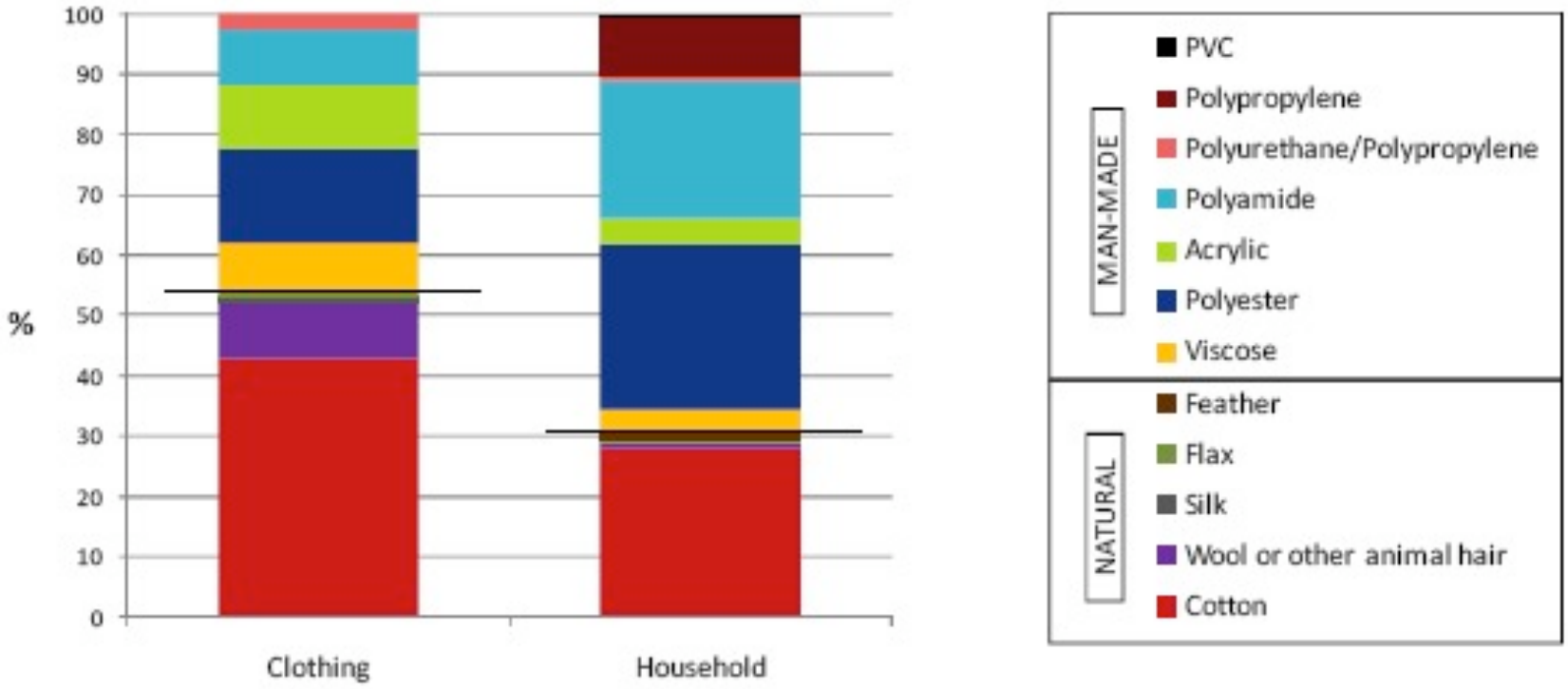
Consumption share for interior textile products [%], [IMPRO, 2009]

Three main product market segments
Fibres, yarns and fabrics (1)



Consumption share for clothing textile products [%], [IMPRO, 2009]

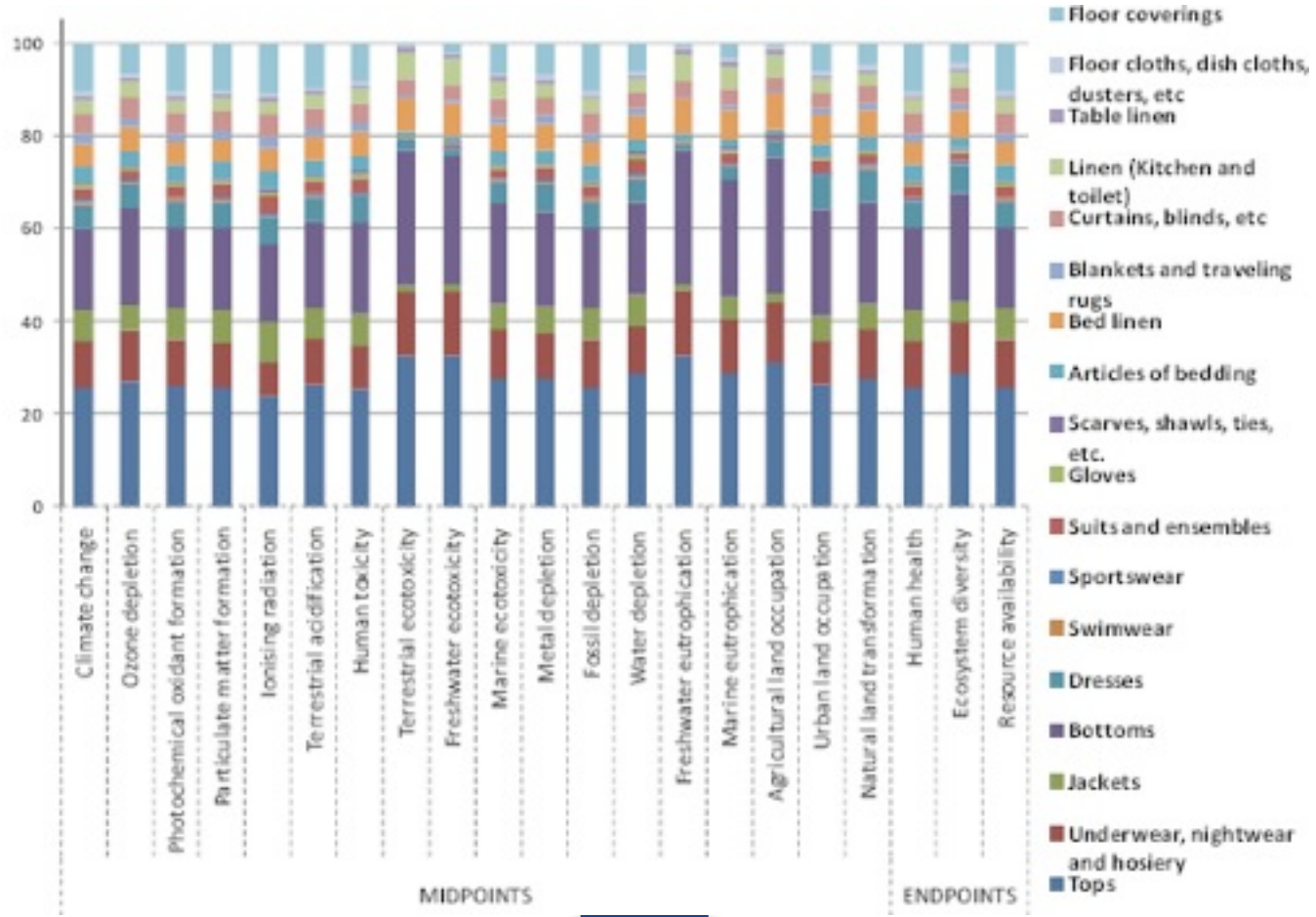
Three main product market segments
Fibres, yarns and fabrics (2)



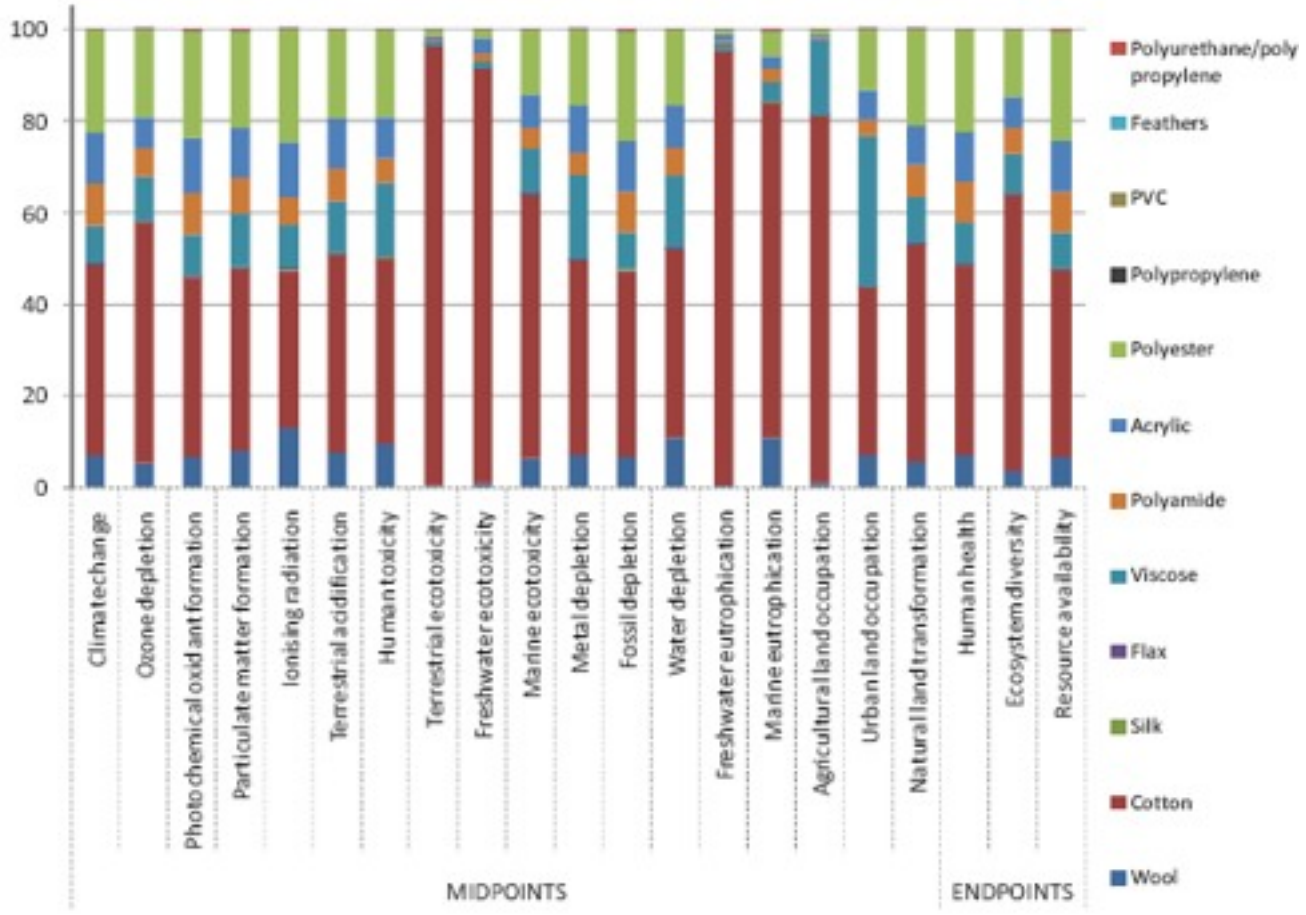
Consumption share for textile fibres [%], [IMPRO, 2009]

IMPRO textile LCA study findings

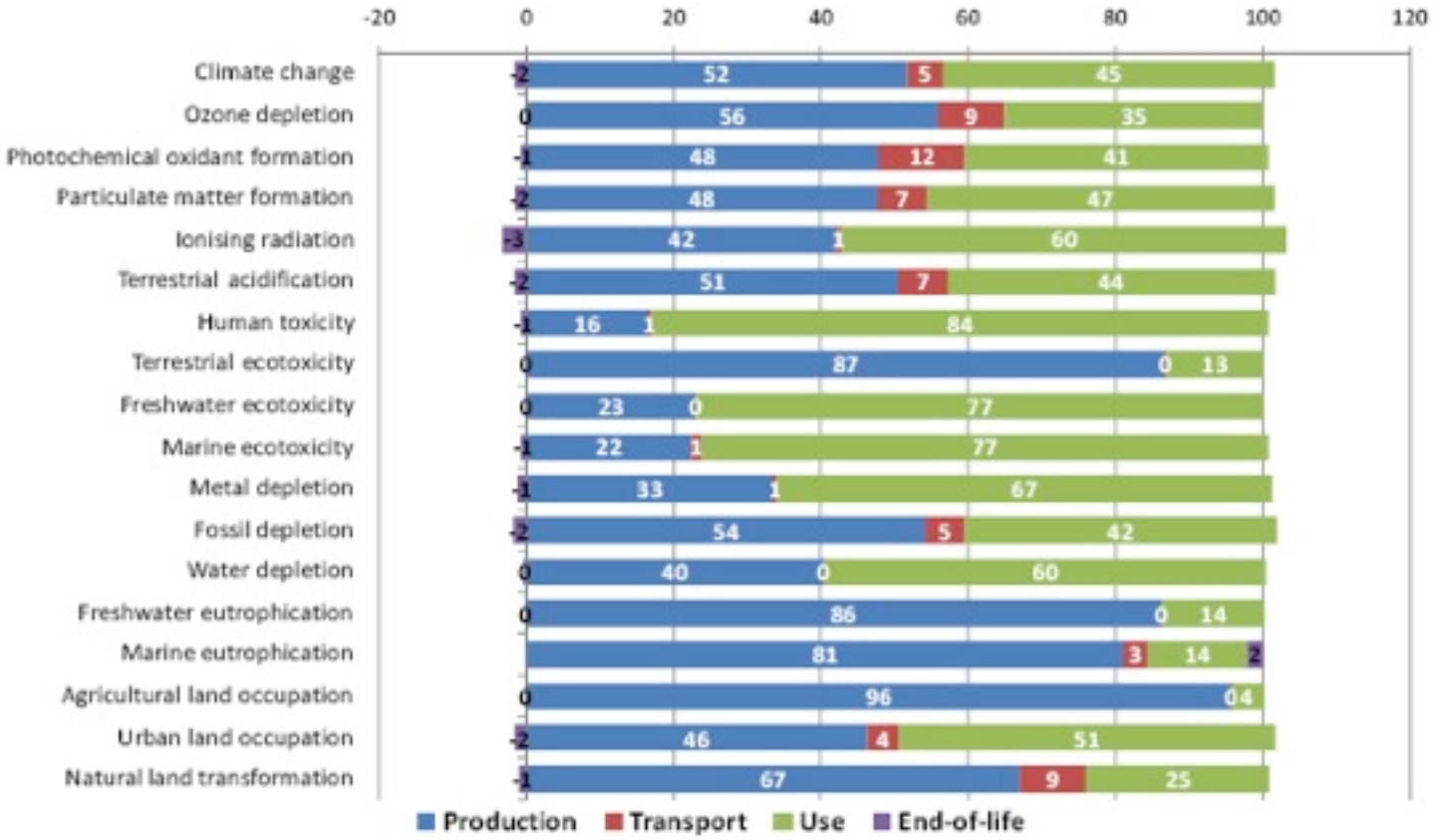
LCA all indicators apportioned by product



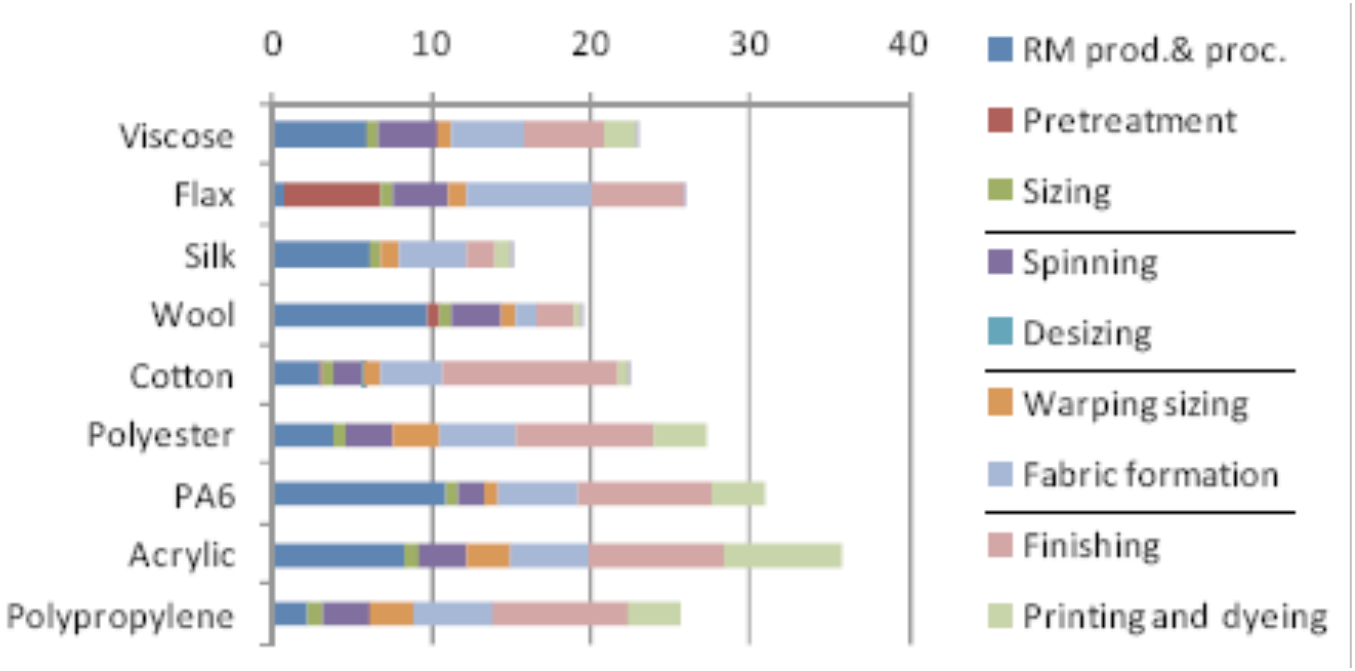
IMPRO textile LCA study findings
LCA all indicators apportioned by fibre



IMPRO textile LCA study findings
LCA results by midpoint indicator

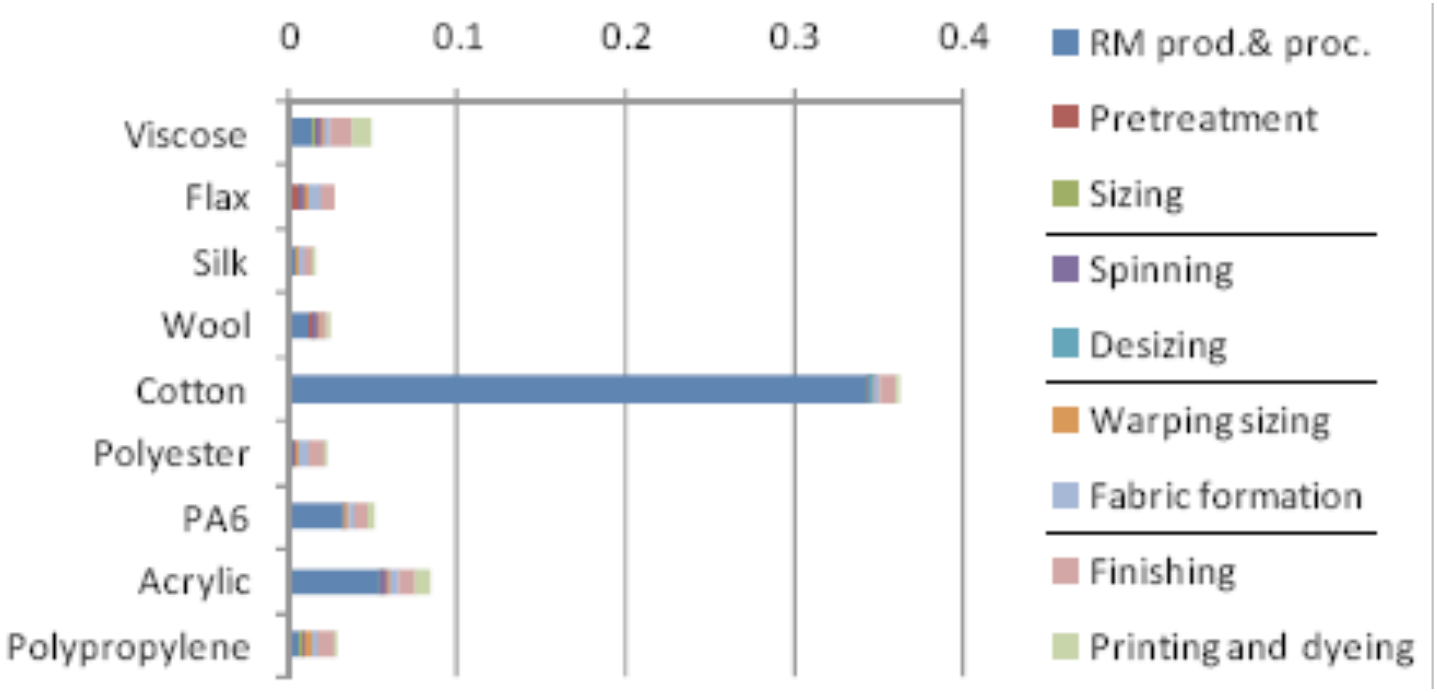


IMPRO textile LCA study findings
Selected midpoints by fibre



Impacts on climate change of textile production according to fibre type and production phases in kg CO_2 eq/kg fabric [IMPRO, 2009]

IMPRO textile LCA study findings
Selected midpoints by fibre



Impacts of textile production, broken down by fibre type and production phases, freshwater ecotoxicity, in kg 1,4-DB eq/kg fabric, [IMPRO, 2009]

Life Cycle Assessment (LCA) evidence base

- The Environmental Improvement Potentials of Textiles (IMPRO Textiles), Author: JRC European Commission, BIO Consulting
- The Danish EDIPTEX, Environmental assessment of textiles study, Author: Danish EPA
- Supplementary LCA evidence:
  - *Sectoral overview: JRC, University of Cambridge*
  - *Fibre comparisons: Plastics Europe, Utrecht University*
  - *Blends: Tampere University*
  - *Use phase: Chalmers University*
  - *Closed loop recycling: Utrecht University*
  - *Industry: Patagonia, M&S, Natureworks, Levi*

Priority areas based on overall LCA findings

Issue	Description	Significance
Cotton	The ecotoxicity associated with the use of agrochemicals and the resource impact of water use for irrigation	High
Synthetic fibres (acrylic, nylon, polyamide, polypropylene)	The climate change and ecotoxicity impact of energy use to manufacture fibres	Medium to high
Wool scouring	The climate change and ecotoxicity impact of associated with scouring and processing	Medium to high
Sustainable systems of resource use	Closed loop recycling, re-use of products and greater durability.	Medium to high
Process energy and ecotoxicity	Fabric formation, finishing, printing and dyeing stages of production	Medium to high
Use phase washing, drying and ironing	Use of energy by consumers or businesses to maintain and clean clothes during the products lifetime	Medium to high
Cellulose fibres (viscose):	The climate change and ecotoxicity impacts associated with the manufacturing of fibres	Medium

How the clothing market has evolved

1980's > 1990's > 2000's > 2010 -

- Specialist mail order
- Pioneer niche retailers

- Pioneer mainstream retailers
  - Germany
  - Switzerland
- Pioneer manufacturers and brands
  - Patagonia, Tejin, Wellman

- Mainstream retailers (selected lines)
  - H&M, M&S, C&A,Carrifour, Ikea
- Specialist manufacturers - TDV
- Non-EU fibre manufacturers

Drivers of eco-innovation?

European Commission

	EU Ecolabel	Nordic Ecolabel	Blaue Engel	Ökotex 100	Ökotex 1000	GOTS
Fibres	✓	✓	✓			✓
Sustainable resource use	Cotton, recycled content	Natural fibres, recycled content				Cotton
Production	✓	✓	✓		✓	✓
Energy consumption	✓*	✓*			✓*	
Air and water pollution	✓	✓	✓		✓	✓
Substance restrictions	✓	✓	✓	✓	✓	✓
Social and ethical criteria		✓	✓		✓	✓
Consumer health	✓	✓		✓		
Fitness for use	✓	✓	✓	✓		✓
End of life						

	Better Cotton Initiative	Global Recycling Standard	Bluesign	Eco-Index	Made-By	Business Social Compliance Initiative
Certification?	3rd	3rd	2nd	2nd	2nd	3rd
Fibres	✓	✓			✓	
Sustainable resource use	✓	✓		✓	✓	
Production			✓	✓		✓
Energy consumption				✓	✓	
Air and water pollution		✓		✓		
Substance restrictions		✓	✓	✓		
Social and ethical criteria	✓	✓				✓
Consumer health						
Fitness for use						
End of life				✓	✓	

Framework for the revision

1. **Focussed technical updates:** based on BREF and technical evidence review
2. **Improved life cycle perspective:** based on a fibre and product LCA review
3. **Reflect product best practice:** based on eco-innovation by manufacturers, retailers and brands
4. **Explore options for label and initiative harmonisation:** based on a review of state, NGO and private label scheme criteria
5. **Improve focus on opportunities in target market segments:** based on textile label, public procurement consumer and industry priorities

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1. Product group definition

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Stakeholder feedback

- **Lower 90% threshold to 75-80%** to reflect complex garments such as suits
- Certification should be possible for **B2B products and processes**
- The scope should focus more on the **end-use for products**
- **Furniture fabrics** should be kept within the scope.
- **Specialist technical fibres** should be addressed – more relevant to GPP?
- Exclude **E-textile** electronic elements - best addressed by the WEEE rules
- **Professional cleaning products** – revision of fitness for use criteria?
- Include **accessories** such as buttons and closings

Composition of complex product

Source: Jin Gam et al (2010)

Product group definition

- **Textile clothing and fabric accessories**: Clothing (defined as tops, underwear, nightwear, hosiery, bottoms, jackets, dresses, suits, sports and swimwear and gloves) and fabric accessories (defined as ties, handkerchiefs, shawls, scarves and bags) bags, shopping bags, rucksacks, belts etc. consisting of at least 85% by weight of textile fibres
- **Interior textiles**: Textile products for interior use (defined as curtains, bed linen, table linen, towels, blankets, throws, mats and rugs) consisting of at least 9085% by weight of textile fibres. Mats and rugs are included
- **Fibres, yarn and fabric**: Intended for use in textile clothing and fabric accessories and interior textiles, to include upholstery fabric prior to the application of backings and treatments associated with the final product.

Additional proposals

- Reduce the **composition threshold** to 85%
  - *Alignment with Directive 2008/121/EC on textile names*
- Exclude **cleaning products**
  - *Nordic Swan criteria contain four specific fitness for use criteria*
- Address **accessories**
  - *Within scope of proposed new Criteria 11: Restricted Substance List, with a focus on plastic and metal components.*
- **Biocidal finish** exclusion
  - *Incorporate into Criteria 11 Restricted Substance List*
- Exclude **E and Smart textiles**
  - *Precautionary studies raise significant concerns about management of textile waste*

Proposed revised text

For 'textile clothing and fabric accessories' and for 'interior textiles': Down, feathers or synthetic materials not covered by this document need not be taken into account in the calculation of the percentage of textile fibre. Membranes and coatings need not be taken into account in the calculation of the percentage of textile fibres. Fillings, linings and padding made of fibres covered by this document shall be taken into account in the calculation of the percentage of textile fibres and shall also fulfil the relevant fibre criteria.

Filling materials that are not made from textile fibres should still comply with restrictions listed in Criterion 11 that relate to auxiliaries, surfactants, biocides and formaldehyde.

Proposed revised text

- Cleaning products
- Single use products
- Wall and floor coverings (Please see the EU Commission Decision 2009/967/EC for textile floor coverings)
- Fabrics that form part of structures intended for use outdoors (such as banners and tents)
- Garments, fabrics and fibres that contain electrical devices or which form an integral part of electrical circuitry
- Garments, fabrics and fibres that contain devices or impregnated substances designed to sense or react to changes in ambient conditions

Assessment and verification

Increased used of certificates as a means of verifying the chain of custody for raw materials.

Assurance needed that certifications are conformity with the EU Ecolabel's requirement for independent third party verification:

'Competent bodies shall ensure that the verification process is carried out in a consistent, neutral and reliable manner by a party independent from the operator being verified, based on international, European or national standards and procedures concerning bodies operating product-certification schemes.'

Proposed additional text

Propose compliance with ISO/IEC Guide 65

'General requirements for bodies operating certification systems'

- Assessment against criteria in a consistent way
- Due diligence and quality assurance by accreditation bodies

Where the applicant uses a certification system to provide third party verifications the chosen system of accreditation and verification should be in line with the criteria contained within ISO/EIC Guide 65.

Comments and feedback?

- Greater product focus
- B2B for processes
- Reduced composition threshold
- Proposed exclusions
- High quality certification systems

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2. Textile fibre criteria

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Stakeholder feedback

- Text allowing *'other fibres for which no fibre specific criteria are set'* to be awarded the label should be deleted
- The **85% threshold for recycled content** is too high as an incentive,
  - *50% would be more achievable, particularly for blends, and would incentivise industry*
- **Specialist technical fibres** should be addressed – although criteria in this area may require more detailed analysis and may be more relevant to GPP
  - *Consideration of specialist technical fibres related to public procurement e.g. firefighting, military*

Proposed approach

- Make fibre listing clearer and more distinguishable by grouping into three more commonly recognised categories
  - *natural, synthetic and regenerated.*
- The text highlighted by stakeholders relating to fibre with no criteria is proposed for deletion.
- Meta-aramids to be investigated for GPP but are not proposed to be added as an EU Ecolabel fibre.
  - *Global production in 2009 amounted to just 64,000 tonnes*

Fibre-specific criteria

- Natural fibres: Cotton and other natural cellulosic seed fibres, flax and other bast fibres, greasy wool and other keratin fibres;
- Synthetic fibres: Acrylic, elastane, polyamide, polyester and polypropylene;
- Man-made cellulose fibres: Cupro, lyocell, modal and viscose..

Other fibres for which no fibre specific criteria are set are also allowed, with the exception of mineral fibres, glass fibres, metal fibres, carbon fibres and other inorganic fibres.

Proposed revision of text

The criteria set in this section for a given fibre-type need not be met if a fibre contributes to less than 5% of the total weight of the textile fibres in the product. However, at least 85% by weight of the whole product must be in compliance with the criteria.

These criteria do not have to be met if the product contains fibres that are of recycled origin constituting at least 70% by weight of all fibres in the product. In this context, recycled fibres are defined as fibres originating only from cuttings from textile and clothing manufacturers or from post-consumer waste (textile or otherwise). Nevertheless, at least 85 % by weight of all fibres in the product must be either in compliance with the corresponding fibre-specific criteria, if any, or of recycled origin.

Comments and feedback?

- Deletion of loophole for other fibres
- Lowering of recycled content threshold

C2 Cotton and other natural cellulosic seed fibres Stakeholder feedback

- The pesticide list was still felt to have value as a safeguard for environmental protection.
- Opinions varied considerably on increasing the minimum organic % content – 0% to 100%.
- Organic cotton's small share of the cotton market was cited as a barrier to raising the minimum % requirement.
- A high % is required to drive the market, differentiate from competitors and make the product meaningful to consumers
- Verification of content claims and possible false claims raised concerns.
- IPM certifications such as Better Cotton Initiative and Cotton Made in Africa are not mature enough yet
- Regarding water use, in general this was felt to be too complex to frame criteria

C2 Cotton and other natural cellulosic seed fibres Updating of the pesticide list

- Evidence suggests, however, that the testing of raw cotton may not always act as an effective safeguard.
- Annual testing results for raw cotton by the Bremen Cotton Exchange 1994 and 2011 show very limited detection of pesticide residues (<0.01 mg/kg threshold)
- This is despite evidence of the continued use of hazardous pesticides in developing countries: WHO Class 1a, 1b and II

Proposal: A stronger criteria focus is required on production systems such as IPM and organic, which are intended to educate farmers and control pesticide use at source.

C2 Cotton and other natural cellulosic seed fibres Revising the minimum organic content (1)

- 2010/11 organic cotton only accounted for 1.1% of the world market (241,276 tonnes)
- Estimates suggest the top ten EU and US retailers account for 70% of organic cotton demand
- Organic cotton may hold an EU market share of approximately 6.5%, the majority accounted for by large brands and retailers.
- Current trend is move to IPM cotton certifications e.g. Adidas, Marks & Spencer, Zara

C2 Cotton and other natural cellulosic seed fibres Revising the minimum organic content (2)

- Analysis of the strategies adopted by leading buyers highlights a dual approach (Table 3.1.2)
  - *blending at lower percentages in order to meet ambitious targets across all mainstream product lines.*
  - *high profile product lines with tailored branding contains higher percentages of organic cotton, 50% and 100%*
- Pricing differential can vary considerably 5% up to 60%

C2 Cotton and other natural cellulosic seed fibres Revising the minimum organic content (3)

- Production largely certified by control bodies recognised by the EU or the USA or by IFOAM
  - *national control bodies such as APEDA in India,*
  - *independent certification bodies such as Ecocert*
  - *content claim standards such as the Textile Exchange's OE Blended and 100%*
- The most substantial evidence of false claims appears to relate to the contamination of organic cotton from India with GM cotton
  - *Certification bodies fined but no wrongdoing identified*

C2 Cotton and other natural cellulosic seed fibres Defining IPM (Integrated Pest Management) cotton (1)

- Directive 2009/128/EC *Establishing a community framework to achieve the sustainable use of pesticides*
  - *introduced a definition of the principles of IPM*
  - *requires Member States to 'take all necessary measures to introduce low-pesticide input pest management'.*
- The principles of IPM and the learning from educational programmes worldwide promoted by the FAO now form the basis for a number of certification scheme

C2 Cotton and other natural cellulosic seed fibres Defining IPM cotton (2)

- Whilst evidence suggests that the benefits of IPM can be substantial until recently it was almost impossible to source certified IPM cotton.
- One of the main problems is the ability to verify that IPM practices are being applied because there are multiple definitions of IPM
- Directive 2009/128/EC now provides a definition of IPM which could form the basis for Ecolabel verification.

The leading certification schemes are based on IPM principles are - Better Cotton Initiative, Cotton Made in Africa , Fair Trade and BMP (Australia). EU SPRING initiative is to develop a scheme for Pakistan in conjunction with WWF-Pakistan

C2 Cotton and other natural cellulosic seed fibres IPM verification and assessment (1)

IPM certification has been compared with Titles V and VI of Regulation 834/2007, and Article 33 of Title VI, and Regulation 1235/2008

- A certificate of inspection is required for the product up to the first consignee by *'competent authorities, control authorities or control bodies'* with at least one verification annually;
- Traceability is ensured *'at all stages of production, preparation and distribution'*.
- Control bodies that are certification bodies are accredited to EN 45011 or ISO Guide 65.

EU IPM principles	Conformity of scheme criteria and systems			
	Better Cotton Initiative	Cotton Made in Africa	Fair Trade	BMP (Australia)
1. Prevention and suppression of harmful organisms	Criteria 1.1 and 3	Criteria 3a/b	*Training required*	IPM and Biosecurity levels 1-2
2. Monitoring of harmful organisms	Criteria 1.1	*Plan required*	Criteria 3.2.3	IPM and Biosecurity levels 1-2
3. Use of decision thresholds	*No specific details*	Criteria 4e	*No specific details*	IPM module (levels 1-2)
4. Preferential use of sustainable control methods	Criteria 1.1	*No specific details*	*Training required*	*No specific details*
5. Use of specific, low impact pesticides	Criteria 1.1	Criteria 4a	*No specific details*	*No specific details*
6. Minimisation of dosage	*No specific details*	*No specific details*	*No specific details*	IPM module (levels 1-2)
7. Anti-resistance strategies	Criteria 1.1	Criteria 4a	*No specific details*	IPM module (levels 1-2)
8. Monitoring of results	Criteria 1.1	*No specific details*	*No specific details*	Not covered at level 1-2

Sources: BCI (2009), CMiA (2011) Fair Trade International (2012) and BMP (2012)

EU control system requirements	Conformity of scheme criteria and systems			
	Better Cotton Initiative	Cotton Made in Africa	Fair Trade	BMP (Australia)
Operator control measures	Yes, due diligence of farmer and farmer group self-assessments	Yes, licensing of producer organisations based on verification of self-assessments	Yes, certification of producer organisation and random checking of farmers	Yes, 3rd party auditing and certification of farms
Product certificate of inspection	Yes, chain of custody for bales	No, cotton is purchased via a 'Demand Alliance'	Yes, physical and documentary traceability are required.	No specific process
EN 45011/ISO Guide 65	No, large farms are 3rd party verified every 3 years	No, cotton Co. and small holding are 3rd party verified every 2 yrs	Yes, FLO CERT is ISO 65 accredited. Annual on-site inspections are carried out.	No, farms are certified for 5 years

Sources: BCI (2009), CMiA (2011) Fair Trade International (2012) and BMP (2012)

C2 Cotton and other natural cellulosic seed fibres Availability of IPM cotton

- The availability of certified cotton via the four major schemes is increasingly rapidly in response to demand from large retailers and clothing manufacturers
  - *BCI and CMiA is estimated at 125,240 t for 2010/11 with a projection of 460,000 t for 2011/12.*
  - *Australian BMP cotton is estimated to represent around 60% of the countries total production (1.2 m tons in 2010/11)*
- Pricing has been indicated to be 3-4% (lower than organic cotton)

C2 Cotton and other natural cellulosic seed fibres

Proposed revised text

2.1 Products should contain the following minimum content of organic or Integrated Pest Management (IPM) cotton:

50% minimum organic or IPM cotton content requirement for selected products: baby clothing, shirts, blouses, t-shirts, jeans, bed linen and towels

10% minimum organic or IPM cotton content requirement for all other products

The organic cotton should be grown according to the requirements laid down in Regulation (EC) No 834/2007 or the US National Organic Programme (NOP). IPM cotton should be grown according to the general principles of IPM laid down in the Directive 2009/128/EC.

C2 Cotton and other natural cellulosic seed fibres

Proposed revised text

Organic and IPM content should be certified by an independent organisation to have been produced in conformity with the production and inspection requirements laid down in Regulation 834/2007/EC or the US National Organic Programme (NOP). The applicant shall provide:

Information about the control body or certification body,

Transaction records which provide evidence of the proportion of certified cotton used on an annual basis.

C2 Cotton and other natural cellulosic seed fibres
Proposed revised text

2.2 Cotton and other natural cellulosic seed fibres (hereinafter referred to as cotton) shall not contain more than 0.5 ppm in total of (sensibility of the test method permitting) of the following substances:

Aldrin, captafol, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, hexachlorocyclohexane (total isomers), 2,4,5-T, chlordimeform, chlorobenzilate, dinoseb and its salts, monocrotophos, pentachlorophenol, toxaphene, methamidophos, methylparathion, parathion, phosphamidon, aldocarb, endosulfan.

C2 Cotton and other natural cellulosic seed fibres Proposed revised text

This requirement does not apply where more than 50% of the cotton content is organically grown cotton or transitional organic cotton, and more than 75% of the cotton is Integrated Pest Management (IPM) cotton.

This requirement does not apply if documentary evidence can be presented that establishes the identity of the farmers producing at least 75% of the cotton used in the final product, together with a declaration from these farmers that the substances listed above have not been applied to the fields or cotton plants producing the cotton in question, or to the cotton itself.

C2 Cotton and other natural cellulosic seed fibres Proposed revised criteria

The applicant shall either provide proof of organic or IPM certification, or documentation relating to the non-use by the farmers or a test report, using the following test methods: as appropriate, US EPA 8081 A (organo-chlorine pesticides, with ultrasonic or Soxhlet extraction and apolar solvents (iso-octane or hexane)), 8151 A (chlorinated herbicides, using methanol), 8141 A (organophosphorus compounds), or 8270 C (semi-volatile organic compounds).

Tests should be made on raw cotton, before it comes through any wet treatment, for each lot of cotton or two randomly selected samples a year if more than two lots of cotton per year are received.

Comments and feedback

- 50% and 10% minimum organic content
- Introduction of IPM cotton
- Two additions to pesticide list
- 75% threshold for IPM exemption from testing

C3 Elastane
Feedback from stakeholders

- Aromatic diisocyanates are reactive chemicals
- Occupational exposure levels would be more appropriate for this criterion
- The Blue Angel label specifies a workplace exposure limit based on MAK values

C3 Elastane
Follow-up research

- Aromatic diisocyanates form the basis for elastane manufacturing
- Commonly used aromatic diisocyanates are toluene diisocyanate (TDI) and diphenylmethane-4,4'-diisocyanate (MDI).
  - *TDI: H317, H330, H334, H351, H373 and H412*
  - *MDI: H317, H334, H351 and H373.*
- These combinations of hazard statements suggest that occupational health exposure pathways should be given greater emphasis.

C3 Elastane

Proposed revised criteria

3.1. Organotin compounds shall not be used.

Assessment and verification: The applicant shall provide a declaration of non-use.

3.2. The emissions to air of aromatic diisocyanates during polymerisation and spinning shall not exceed 0.005 ml/m³ in the workplace measured in those process stages in which they occur, expressed as an 8-hour average value (shift mean value).

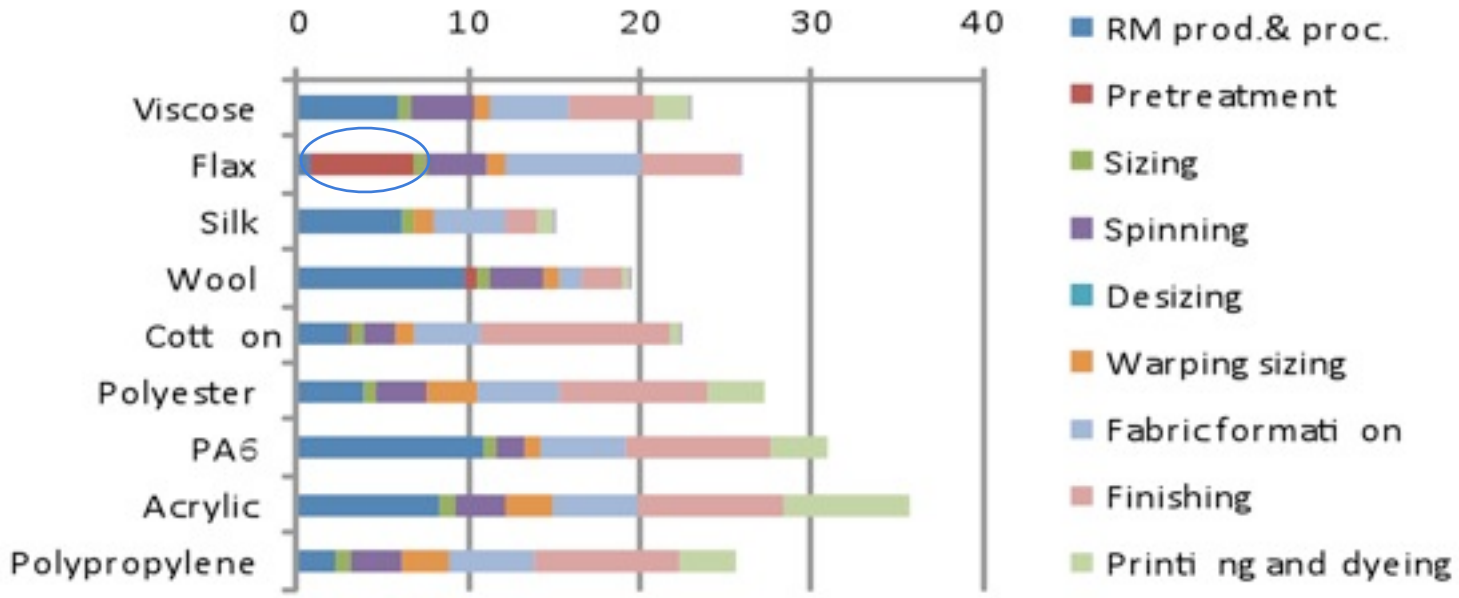
Assessment and verification: The applicant shall provide detailed documentation and/or test reports showing compliance with this criterion, together with a declaration of compliance.

Comments and feedback?

- Workplace emissions of di-isocyanates

C4 Flax and other bast fibres

LCA climate change midpoint



Impacts on climate change of textile production according to fibre type and production phases in kg CO_2 eq/kg fabric [IMPRO, 2009]

C4 Flax and other bast fibres
Stakeholder feedback

- Those that responded were not in favour of introducing a new criterion.
- Whilst it was accepted that inefficient mechanical processes may be used for fibre extraction, a reduction in energy use should not be traded for greater chemical use.
- Comments were also made about the potential quantity of herbicides used on some flax crops.
- New technologies such as ultrasound have the potential to reduce chemical requirements significantly.

C4 Flax and other bast fibres

Follow-up research

- Retting is the first stage in the extraction of bast fibres
- In most of Europe, which accounts for 34% of global flax production, water or dew retting are used
- Expert literature also highlights enzymatic, chemical and mechanical retting as industrial options
- Ultrasound is currently only used at one site in the EU, so cannot be considered to yet be commercially available
- Supplementary LCA studies highlight higher energy use associated with industrial retting options

C4 Flax and other bast fibres
Proposed revised criteria

Flax and other bast fibres should be retted in ambient conditions without thermal energy inputs.

Assessment and verification: The applicant should provide documentation and records of land use and harvesting.

Flax and other bast fibres shall not be obtained by water retting, unless the waste water from the water retting is should be treated so as to reduce the COD or TOC of wastewater from retting ponds by at least 75 % for hemp fibres and by at least 95% for flax and the other bast fibres.

Assessment and verification: If water retting is used, the applicant shall provide a test report, using the following test method: ISO 6060

C5 Greasy wool and other keratin fibres
Stakeholder feedback

- The proposal to introduce a minimum requirement for organic wool was not supported.
- It was proposed to distinguish between wool sales lots and processing lots in order to improve the testing requirements
- The criteria should move towards the model used in Australia where residue tests are applied to farm consignments of wool (sales lots)
- The wastewater criteria generated the most comments.
  - *In New Zealand it is not possible to meet the criteria because at least two scouring processes maximise grease recovery (>76%) but do not have advanced wastewater treatment*
  - *In Australia a scour cannot meet the off-site target because they treat effluent to 60 and 80 g/kg this is then reduced 90% by a municipal plant*

C5 Greasy wool and other keratin fibres
Follow-up research

- It is not proposed to update the ectoparasticide list at this stage.
- The current testing process does not provide sufficient re-assurance that the Ecolabel criteria are being consistently met
- Sales lots of wool should be specified for testing rather than scouring lots, which can be made up of many different sales lots.
  - *IFOAM provide sampling recommendations of between 4 and 8 samples per 10-50 tonnes of lot*
  - *In Australia composite samples from 10 sales lots can now be tested*

C5 Greasy wool and other keratin fibres
Wool scouring in Australia and New Zealand

- Only four plant appear to remain in Australia and the industry in New Zealand has consolidated down to four plant.
- Operators have sought to differentiate themselves in two ways
  - *Pre-cleaning wool to improve optical brightness and reduce detergent use*
  - *EU Ecolabel supplier, by investing in advanced effluent treatment technology.*
- As of 2010 four out of five of the remaining wool scouring operations in New Zealand discharged to municipal wastewater treatment works
- Only one of these has treatment to a tertiary level, one to secondary and the other three to primary.

Evidence collected suggests that at least two of the four sites in New Zealand (Kaputone and Awatoto) and two of the four sites in Australia (Michell and E.P.Robinson), could meet the criteria.

C5 Greasy wool and other keratin fibres

Gearing the criteria to the two different approaches

Scour x (new BAT techniques)

- Pre-cleans the wool to improve optical brightness
- Achieves very high levels of grease recovery (>76%)
- Claims a significant reduction in detergent use
- Recovers value from grease and fibre

COD: <180-190 g/kg before secondary treatment off-site

Scour y (current BAT techniques)

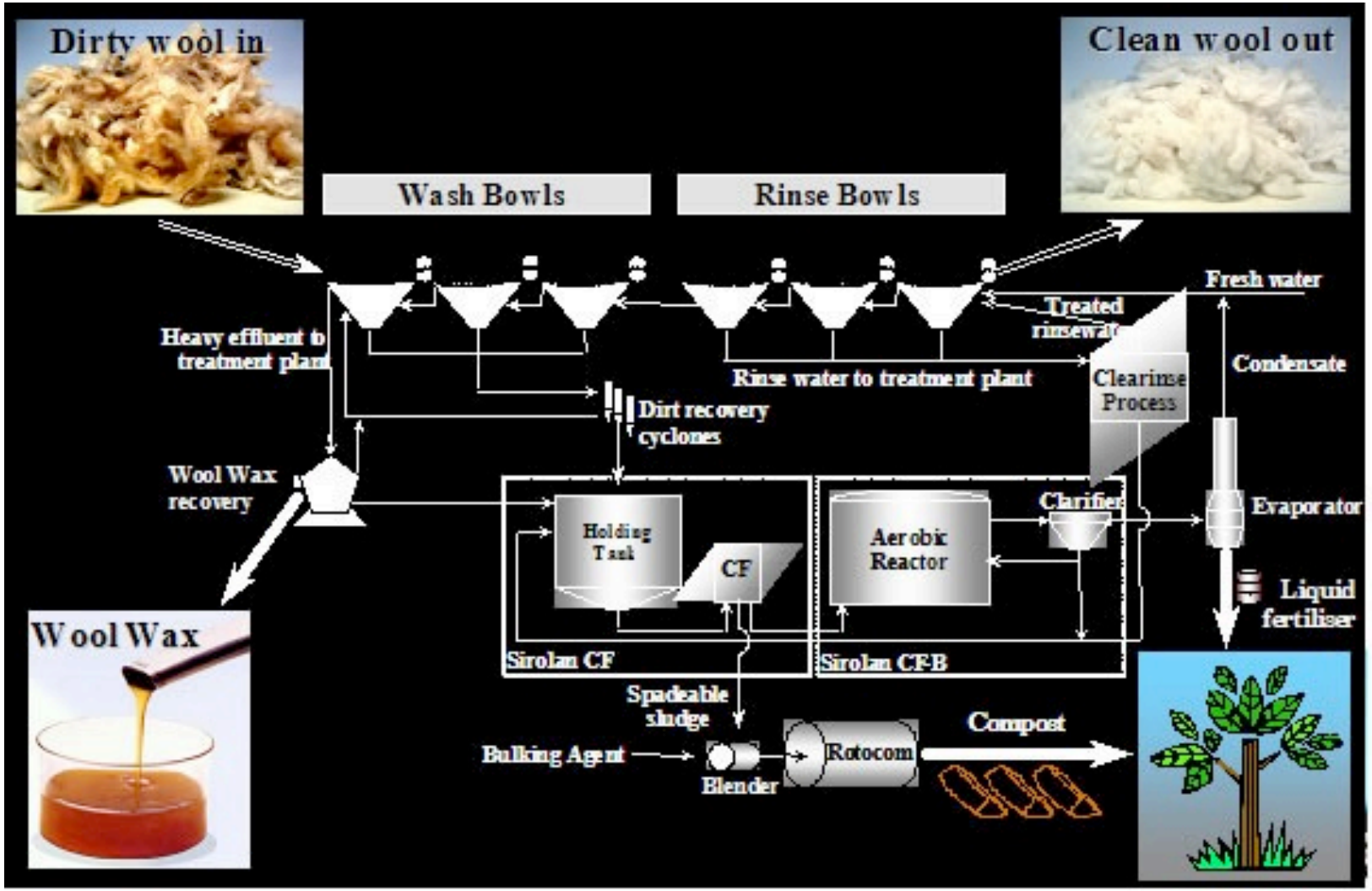
- Achieves BAT levels of grease recovery (40-50%)
- Recovers value from grease and fibre
- Has invested in advanced BAT two stage effluent treatment

C5 Greasy wool and other keratin fibres

BREF wastewater treatment comparison

Fine wool	Discharge to sewer	Dirt/ grease loop	Flocculat.	Dirt/ grease loop + flocculat.	Evaporat.	Dirt/ grease loop + evaporat.
Unit/t of greasy wool	A	B	C	D	E	F
Net water consumed (m^3)	12	6 (1)	12	6 (1)	12	6 (1)
COD from the mill (kg)	529	352	118	97.4	4.8	3.7
COD to environment (kg)	106	71	24	19.5	1.0	0.7
Sludge to dispose of (2)						
- from rec. loop (kg)		167		167		167
- from floccul. (kg)			464	287		
- from evapor. (kg)					529	326
Source: [187, INTERLAINE, 1999]						
(1) 2 - 4 l/kg is possible						
(2) wet weight (50 % dry weight)						

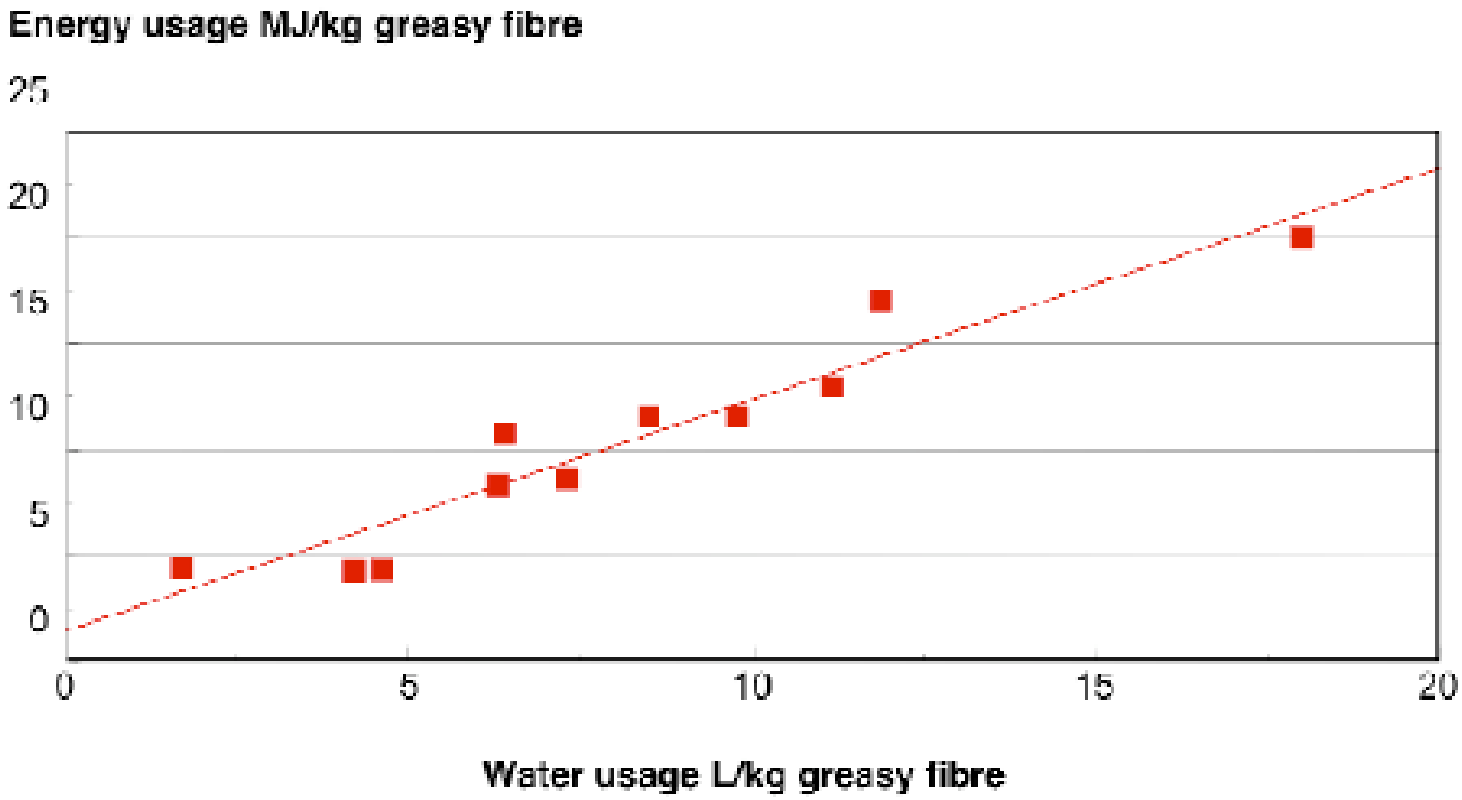
Source: BREF (2003)



Source: AWI (2010)

C5 Greasy wool and other keratin fibres

Wool scouring energy use



Source: BREF (2003)

C5 Greasy wool and other keratin fibres
Proposed revised criteria

5.1 The following sum totals shall be achieved for wool ectoparasticide concentrations on raw wool prior to scouring:

- The sum total content of the following substances shall not exceed 0.5 ppm : γ-hexachlorocyclohexane (lindane), α-hexachlorocyclohexane, β-hexachlorocyclohexane, δ-hexachlorocyclohexane, aldrin, dieldrin, endrin, p,p'-DDT, p,p'-DDD.

- The sum total content of the following substances shall not exceed 2 ppm: diazinon, propetamphos, chlorfenvinphos, dichlorfenthion, chlorpyriphos, fenchlorphos.

- The sum total content of the following substances shall not exceed 0.5 ppm: cypermethrin, deltamethrin, fenvalerate, cyhalothrin, flumethrin.

- The sum total content of the following substances shall not exceed 2 ppm: diflubenzuron, triflumuron, dicyclanil.

C5 Greasy wool and other keratin fibres

Gearing the criteria to the two different approaches

These requirements (as detailed in points 5.1, 5.2, 5.3 and 5.4 and taken separately) do not apply if:

- More than 50% of the wool is organically produced wool (including transitional wool), that is to say certified by an independent organisation to have been produced in conformity with the production and inspection requirements laid down in Council Regulation (EC) No 834/2007.
- Documentary evidence can be presented that establishes the identity of the farmers producing at least 75 % of the wool or keratin fibres in question, together with a declaration from these farmers that the substances listed above have not been applied to the fields or animals concerned.

C5 Greasy wool and other keratin fibres Proposed revised criteria

The applicant shall either provide the documentation indicated above or provide a test report, using the following test method: IWTO Draft Test Method 59.

The test should be made on sales lots of raw wool, before it comes through any wet treatment. A minimum of one composite sample of multiple farmer lots should be tested per 50 tonne of sales lots where only one lot is purchased, or two randomly selected samples per year for larger orders. A composite sample should consist of wool fibres from at least 10 randomly selected farmer lots within the sales lot.

C5 Greasy wool and other keratin fibres Proposed revised criteria

5.2. For scouring effluent discharges the COD limits applicable will depend on the efficiency of grease recovery.

For wool scouring operations that achieve a minimum total recovery of grease from raw wool of 70% the COD discharged to sewer shall not exceed 180 g/kg greasy wool. The effluent shall then be treated off-site to a minimum of secondary treatment standard as defined by Annex I of Council Directive 91/271/EEC.

For wool scouring operations that achieve a total recovery of grease from raw wool of less than 70% the COD discharged to sewer shall not exceed 24 g/kg greasy wool. No further treatment is then required.

In all cases the pH of the effluent discharged to surface waters shall be between 6 and 9 (unless the pH of the receiving waters is outside this range), and the temperature shall be below 40 °C (unless the temperature of the receiving

C5 Greasy wool and other keratin fibres Proposed revised criteria

The applicant should provide reports and annual data from on-site monitoring of wool lots and grease recovery equipment.The wool scouring plant shall describe, in detail, their treatment of the scouring effluent, how value is recovered from by-products and monitoring systems for COD-levels. The applicant shall provide relevant data and test reports related to this criterion, using the following test method: ISO 6060.

C5 Greasy wool and other keratin fibres Proposed revised criteria

5.3 Value should be obtained from wool grease, suint and sludge collected from recovery circuits and wastewater treatment plant. Sludge should not be landfilled or incinerated.

Assessment and verification: The applicant should provide reports and waste transfer notes confirming the recovery routes for waste streams.

Comments and feedback?

- Gearing of COD limits to grease recovery
- Introduction of organic wool as an option
- Value to be obtained from main by-products
- Composite samples of farmer lots (up to 50 tons)
- Random sampling (> 50 tons)

C6 Man-made cellulose fibres
Stakeholder feedback

- The AOX limit cannot be reduced further because chlorinated bleaches must be used to meet market requirements.
- It should be clarified if the focus is to be on AOX in wastewater or the fibre.
- Energy benchmarks are difficult to apply and the processes used to produce regenerated cellulose fibres are not as energy intensive as stated;
- The LCA study carried out by Shen and Patel (2010) 'Life cycle assessment of man-made cellulose fibres' should be reviewed as evidence;
- The introduction of certification for sustainable dissolving pulp was supported, however, it is difficult to obtain and therefore a target of 25% was proposed.

C6 Man-made cellulose fibres
LCA-based improvement options

1) Using cleaner sources of power/steam, which in part can be influenced by locational factors such as the electricity grid emission factor and the availability of local district heating;

2) Moving to integrated pulp and fibre production (a biorefinery approach) with black liquor and other by-products being used to fuel the processes and to offset on-site emissions;

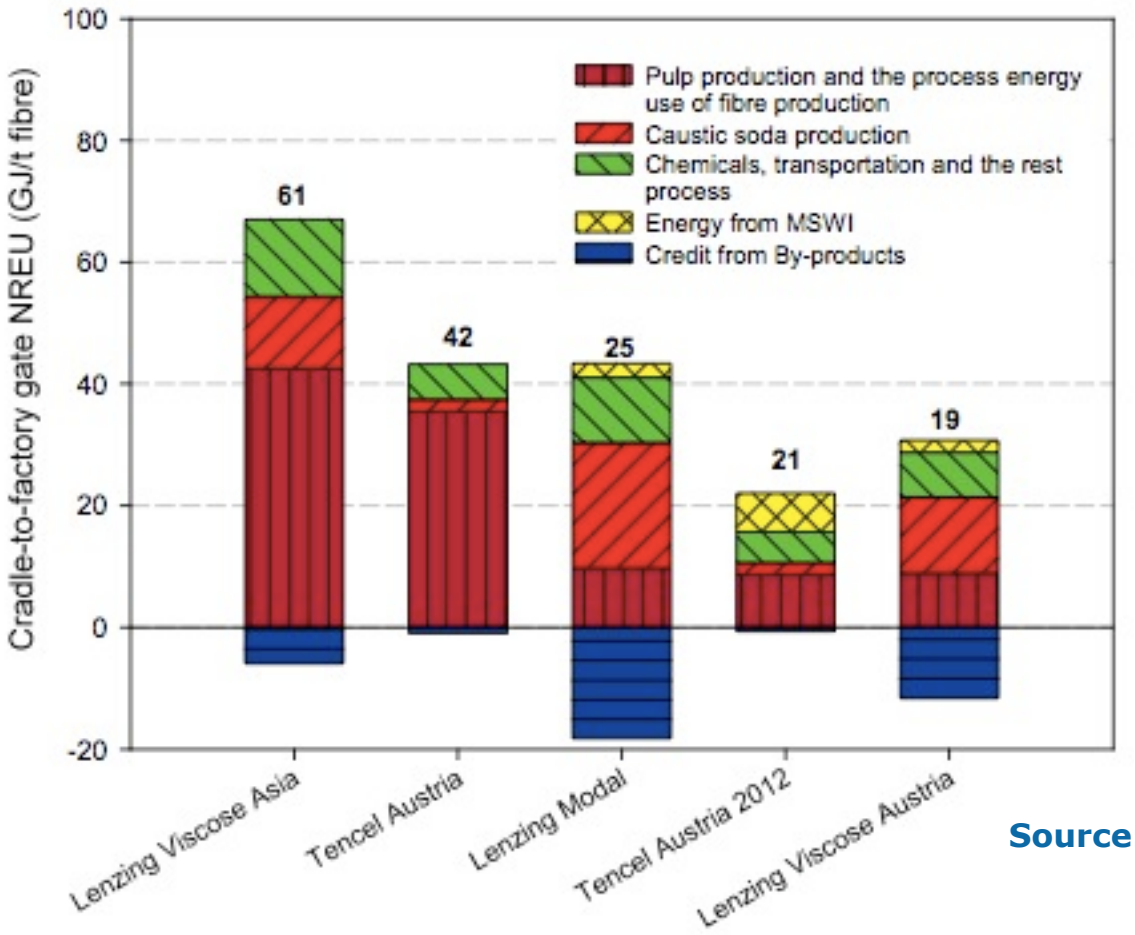
3) Minimisation of caustic soda use in pulp and fibre production because of the environmental impacts associated with its production, which mainly relate to the electrolysis of sodium chloride;

4) Minimisation of carbon disulphide solvent emissions to air and water from the viscose and modal fibre production stage;

5) Moving to lyocell production because of the different chemistry which is

C6 Man-made cellulose fibres

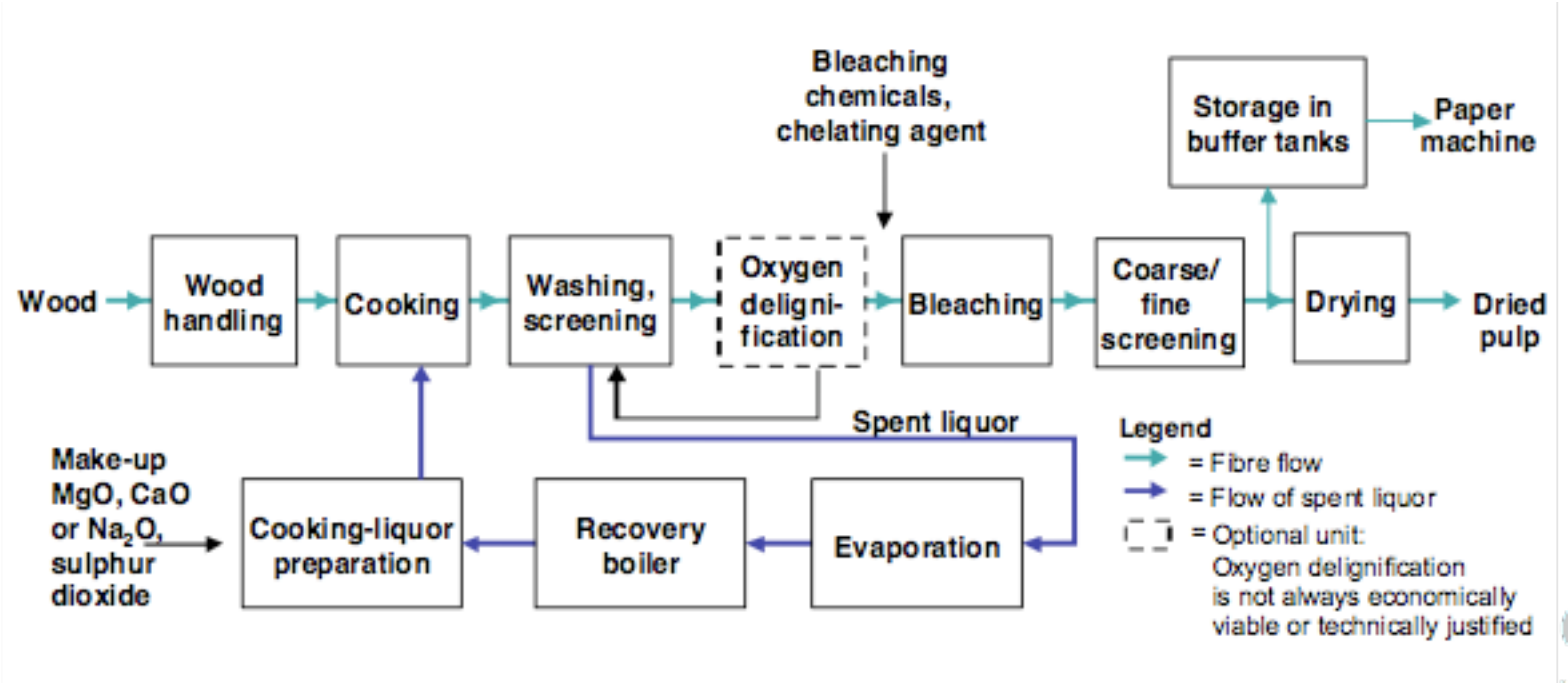
LCA comparison of viscoce, modal and tencel



Source: Shen & Patel (2010)

C6 Man-made cellulose fibres

Recovery of energy from by-products (BREF BAT)



Source: IPPC Bureau (2012)

C6 Man-made cellulose fibres
Bleaching and AOX emissions

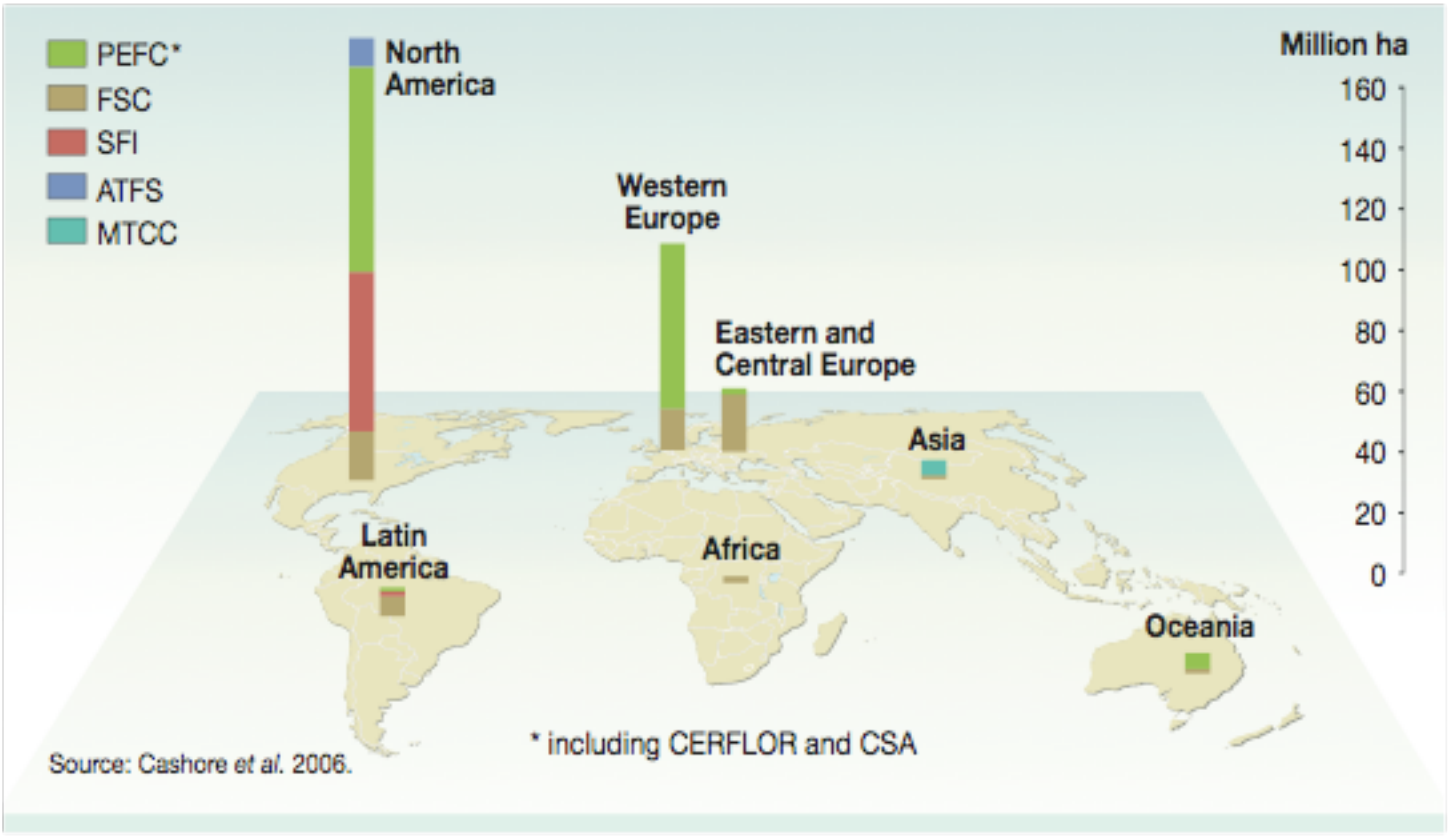
- Elemental Chlorine Free (ECF) processes are increasingly being replaced by Total Chlorine Free (TCF) processes
- For market pulp ECF bleaching predominates and TCF dissolving pulp is difficult to obtain.
- Whilst TCF dissolving pulp appears to account for at least 13% of global production it is not commonly used for fibre production.
- At the fibre production stage sodium hypochlorite (NaClO) is still required by the industry to meet customer requirements for uniform whiteness.

C6 Man-made cellulose fibres
Sustainable and legal sourcing of pulp

- European sustainable forestry policy and certification schemes for sustainable forestry have their basis in the UNEP and FAO principles of Sustainable Forestry Management (SFM)
- The two most significant certification schemes are the Forestry Stewardship Council (FSC) and the Programme for the Endorsement of Forestry Certification (PEFC)
  - *In 2009 these schemes accounted for 9% of global forestry and 26% of industrial timber supplies*
  - *The majority (over 90%) of certified timber is from Europe and North America.*
- Belgium, Germany, the UK and the Netherlands are notable for their detailed monitoring and evaluation of forestry certification schemes
  - *Their current consensus is that FSC and PEFC provide sufficient levels of assurance, with the exception of PEFC Malaysia which is excluded by the Netherlands*

C6 Man-made cellulose fibres

Sustainable and legal sourcing of pulp



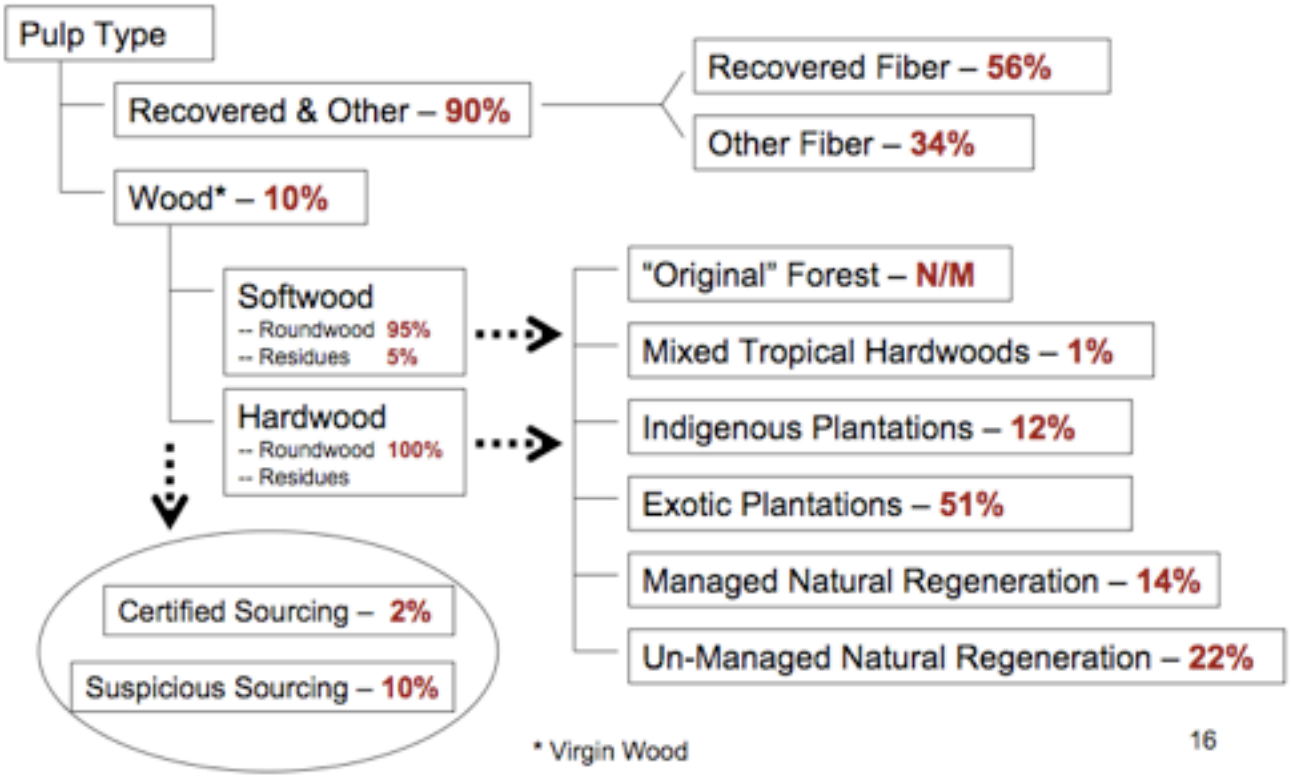
Source: UNEP (2009)

C6 Man-made cellulose fibres
Certification and governance

- It has been highlighted by the UNEP, the FAO and by European Commission policy that in countries where there is poor governance and limited enforcement of forestry protection these schemes cannot be expected to work
- Given the feedstocks commonly used in market dissolving pulp, a proportion may be sourced from where there may be greater concerns about illegal forestry
- A reduction in illegally harvested timber is a policy objective for Europe. The new EU Timber Regulation (EC) 95/2010 will introduce new requirements for the sourcing of timber products from 2013.
- For new products introduced onto the EU market the regulation will prohibit illegally harvested timber and introduce requirements for 'due diligence'
  - *The regulation will recognise FLEGT and CITES licenses*
  - *Existing third party certification systems that meet the due diligence criteria.*

C6 Man-made cellulose fibres

Wood pulp sourcing (China 2004)



Source: Goetzl, A (2008) Seneca Creek Associates

C6 Man-made cellulose fibres
Proposed revised criteria

a) The level of AOX in the fibres shall not exceed 150 ppm.

Assessment and verification: The applicant shall provide a test report, using the following test method: ISO 11480.97 (controlled combustion and microcoulometry).

b) Energy recovery from by-products of the production process should be maximised in order to contribute to on-site power, heat and steam requirements. Energy self-sufficiency of >xx% should be achieved for dissolving pulp production and xx% for integrated production.

Assessment and verification: The applicant shall provide documentation and evidence of the energy balance for market dissolving pulp or integrated pulp and fibre production sites.

C6 Man-made cellulose fibres
Proposed revised criteria

c) For viscose fibres, the sulphur content of the emissions of sulphur compounds to air from the processing during fibre production, expressed as an annual average, shall not exceed 60 g/kg filament fibre produced and 30 g/kg staple fibre produced. Where both types of fibre are produced on a given site, the overall emissions must not exceed the corresponding weighted average.

Assessment and verification: The applicant shall provide detailed documentation and/ or test reports showing compliance with this criterion, together with a declaration of compliance.

(d) For viscose fibres, the emission to water of zinc from the production site, expressed as an annual average, shall not exceed 0.16 g/kg filament fibre produced and 0.30 g/kg staple fibre produced.

Assessment and verification: The applicant shall provide detailed documentation and/ or test reports showing compliance with this criterion, together with a declaration of compliance.

C6 Man-made cellulose fibres

Proposed revised criteria

e) A minimum of 25% **dissolving** pulp fibres shall produced from **timber** that has been grown according to the principles of Sustainable Forestry Management as defined by the UN FAO. This figure will increase 5% for each year after the Decision date of the criteria. The remaining % of pulp fibres shall be from pulp that is from legal forestry.

Assessment and verification

The applicant shall provide valid chain of custody certificates demonstrating that pulp fibre has been independently certified to have been grown according to Sustainable Forestry Management principles and is from legal sources. FSC and PEFC shall be accepted as independent certification schemes. Due diligence processes should be followed according to Regulation (EC)19/2010 to minimise the risk that timber has been illegal harvested. Valid FLEGT or CITES licenses or third party certification will be accepted as evidence of legal sourcing.

f) Dissolving pulp produced from cotton linters shall meet with the requirements of the cotton criterion.

Comments and feedback?

- Reduction in AOX level in fibres
- Additional LCA-based improvement options
  - *Site energy self-sufficiency from by-products*
  - *Minimisation of caustic soda use*
- Alignment of carbon disulphide and zinc emissions limits with BREF Polymers
- Sustainable and legal pulp sourcing

C7 Polyamide (nylon)
Stakeholder feedback

- The criteria should better reflect values given in the polymer BREF
- An energy benchmark was not supported because it would be too complex to normalise and verify.
- More evidence was requested as to whether the criteria could be harmonised with the Blue Angel.
- Nylon with a recycled content is not generally available and there is only one example of such a project in Europe.

C7 Polyamide (nylon)
Follow-up research

- Caprolactam (an amine), adipic acid and cyclohexanone account for 89.4% to 92.4% of the primary energy inputs required to manufacture polyamide fibres
- An energy or CO_2 benchmark criteria for nylon fibre would be too complex to introduce and would not achieve a significant enough impact
  - *Caprolactam production will not be included within the EU Emission Trading Scheme 2013-2020*
- A recycled content is considered to be a more effective option as it would reduce raw material and process energy use upstream of caprolactam polymerisation.

C7 Polyamide (nylon)
A minimum recycled content?

- A comparative LCA study of virgin nylon and recycled nylon for carpet manufacturing carried out for Shaw Carpets (2010) and reviewed by LBP-GaBi University of Stuttgart highlights the significant environmental improvement potential of recycled nylon
- The following products have been used in clothing products available on the EU market:
  - *Hyosung (Taiwan): MIPAN Regen nylon 6 product with 100% recycled content, third party certified by the Global Recycled Standard (GRS) . Pre and post consumer waste is used as feedstock.*
  - *Unifi (USA): REPREVE fibre product with 100% recycled content. Pre and post consumer waste is used as feedstock. The recycled content of the fibre is third party certified.*
- Consultation with a stakeholder confirms:
  - *limited availability and higher price.*
  - *Quality is also still a concern - dyeability and mechanical strength.*

C7 Polyamide (nylon)
Proposed revised criteria

The emissions to air of N_2O during monomer production, expressed as an annual average, shall not exceed:
- 10 g/kg polyamide 6 fibre produced
- 16,5 g/kg polyamide 6.6 produced

Assessment and verification: The applicant shall provide detailed documentation and/or test reports showing compliance with this criterion, together with a declaration of compliance.

Fibres shall be manufactured using a minimum content of 3% nylon that has been recycled from pre and/or post-consumer waste.

Assessment and verification: Content shall be traceable back to the reprocessing stage. This shall be verified by independent third party certification of the chain of custody or by documentation provided by suppliers and processors.

Comments and feedback?

- Alignment of polyamide 6,6 limit value with the Blue Angel
- Introduction of minimum recycled content 3%

C8 Polyester
Stakeholder feedback

- The criteria should reflect values given in the polymer BREF
- An energy benchmark was not supported because it would be too complex to normalise and verify.
- The VOC emissions limit value could be lowered to 0.2 g/kg based on the Blue Angel.
- The potential to reduce the antimony limit value should be investigated as evidence cited suggests that up to 175 ppm can leach out of the fibre during processing stages such as dyeing.
- Whilst manufacturing polyester using recycled PET can reduce the environmental impact of polyester, recycling systems in the EU are based on the recycling of PET drinks bottles and their availability is constrained because of demand on the global market from China.

C8 Polyester
Stakeholder feedback

- It may not be feasible or economic to manufacture filament fibres and microfibres from recycled feedstock. The functionality and grade of polyester should be considered when considering recycled content.
- Polyester fibres are not recovered in sufficient quanities to link the criteria to closed loop recycling.
- The recycling of synthetic fibres may lead to the cycling of hazardous substances.

C8 Polyester
Antimony polymerisation catalysts

- Expert commentators suggest that Antimony catalysts are still used in 97% of global polyester manufacturing
  - *The optimum range used by industry is quoted as 280-350 ppm and that raising it further requires additional energy use*
  - *A US carpet manufacturer claims that it may be present in levels as high as 650-700 ppm*
- Antimony ensures a high level of colour fastness in order to avoid yellowing upon exposure to light e.g. curtains
- Evidence suggests that exposure from finished garments is negligible because the catalysts are bound into the fibre
  - *Other exposure pathways include leaching from fibres during high temperature dyeing and air or solid waste emissions if fibres are incinerated.*
  - *A US carpet manufacturer claims that up to 175 ppm may leach, however, this could not be substantiated*

Antimony trioxide: R51 (H351 Suspected of causing cancer)

C8 Polyester
Minimum recycled content? (1)

- Recycled PET (R-PET) can be used to manufacture polyester fibres
  - *Mechanical route, in which spinning chips are remelted and extruded into fibres at around 250°C,*
  - *Chemical route, in which the PET feedstock is depolymerised before being polymerised again and extruded into fibres.*
- Comparative LCA study of virgin PET and R-PET (Shen et al 2010) highlights the environmental improvement potential of both options for eight out of nine of the impact categories used
  - *NREU 40% to 85% improvement*
  - *GWP 25% to 75% improvement*

C8 Polyester
Minimum recycled content? (2)

Polyester staple fibre is used to manufacture non-woven fabrics such as fleece.

- CIRFS suggest that 70% of EU staple polyester production, which was 600,000 tonnes in 2009
- Some end-uses, such as medical devices, are excluded because of hygiene restrictions on recycled content.
- Micro-fibres cannot be manufactured from recycled polyester

Polyester filament fibre is used to manufacturer woven fabrics.

- It is a higher quality product requiring higher technical specifications in order to ensure qualities such as colour, tenacity, tensile strength and dyeability
- The heterogenous nature of the R-PET feedstock means that consistency cannot always be assured

C8 Polyester
Recycled content exemptions? (3)

Feedback from major retail brands, colour experts and licenseholders suggests the following:

- The use of recycled polyester in products such as fleece is mature and can tolerate imperfections
- Major clothing brands and corporatewear providers are using varying quantities of recycled polyester (e.g. up to 100% filament) and do not report problems with availability and quality, with the exception of:
  - *Light colours, including white*
  - *Fabrics that require a high lustre*
  - *Colour matching e.g. corporate uniforms*
- Licenseholders manufacturing interior textiles have limited experience with the product and may need to test fibres to assure quality and colour e.g. tenacity, piling

C8 Polyester
Filament fibre suppliers (4)

Mechanically recycled content

- Two EU manufacturers are understood to manufacture filament fibre products – Filature Miroglio (100%) and Radici (70%), both in Italy.
  - *Both claim that the fibres are suitable for a wide variety of clothing applications, including technicalwear and sportswear*
- The US manufacturer Unifi's REPREVE product (20%) is used by major outdoor brands such as Patagonia and the North Face.
- The Global Recycle Standard content standard lists 18 manufacturers of polyester filament and fabric containing filament with a recycled content 10-100%

Chemically recycled content

- There are only two manufacturers globally – Teijin in Japan which has pioneered the technology and Hyosung in Korea, both manufacturing 100% content fibres

C8 Polyester
GRS recycled content spread (5)

Recycled content	Proportion of GRS certified fibres
100%	74.1%
75 – 99%	2.1%
50 – 74%	6.7%
26 – 49%	12.6%
5 – 24%	4.5%

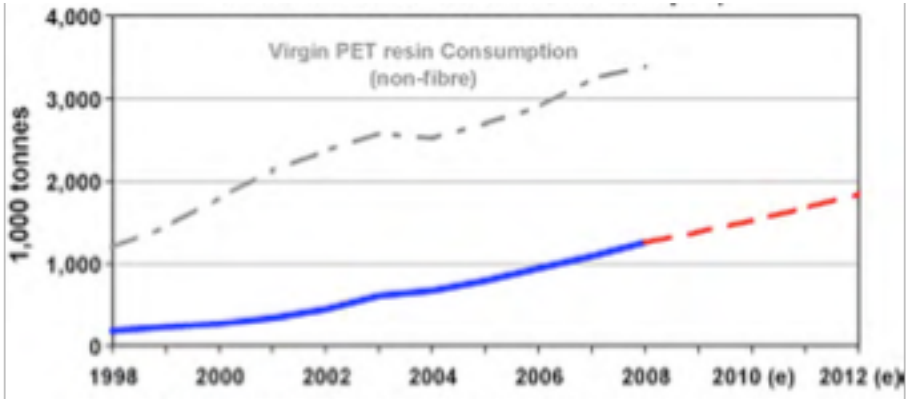
Source: Control Union (2012)

C8 Polyester

PET bottle recovery statistics (6)

R-PET Capacity all in [kt/a]	1999	2002	2003	2004	2006	*2010*
North America	470	480	500	550	600	*800*
Europe	211	350	430	680	944	*>1200*
ME, Asia, South America, Others	218	370	470	680	1 700	*3 000*
World R-PETBottle Flakes	*899*	*1200*	*1400*	*1 900*	*3 100*	*5,000*
World PET-resin	*7 100*	*9 900*	*11 800*	*12 500*	*16 300*	*19 200*
Recycling potential	***6 201***	***8 700***	***10 400***	***10 600***	***13 200***	***14 200***

Source: Thiele (2007)



C8 Polyester
Proposed revised criteria

(a) The amount of antimony in the polyester fibres shall not exceed 260 ppm. Where no antimony is used, the applicant may state 'antimony free' (or equivalent text) next to the eco-label.

Assessment and verification: The applicant shall either provide a declaration of non-use or a test report using the following test method: direct determination by Atomic Absorption Spectrometry. The test shall be carried out on the raw fibre prior to any wet processing.

C8 Polyester
Proposed revised criteria

(b) The emissions of VOCs during the polymerisation and fibre production of polyester from terephthalic acid (TPA), and during the production of filament fibres, measured at the process steps where they occur, including fugitive emissions as well, expressed as an annual average, shall not exceed 1.2 g/kg for PET chips and 10.3 g/kg for filament fibre

Assessment and verification: The applicant shall provide detailed documentation and/or test reports showing compliance with this criterion, together with a declaration of compliance. VOCs are defined as any organic compound having at 293.15 K a vapour pressure of 0.01 kPa or more, or having a corresponding volatility under the particular conditions of use.

C8 Polyester
Proposed revised criteria

(c) Fibres shall be manufactured using a minimum content of PET that has been mechanically or chemically recycled from post-consumer waste. Staple fibres should have a minimum content of 50% and filament fibres 20%.

Possible exemptions – *micro-fibres, fibres for use in medical facilities, fibres to be washed in industrial laundries, fabrics that are required to be optical white, light colour shades or of a high lustre.*

Assessment and verification: Content shall be traceable back to the reprocessing stage. The applicant shall provided independent third party certification of the chain of custody or documentation provided by suppliers and reprocessors that enables the feedstock to be traced.

Comments and feedback?

- Retain antimony limit value at 260ppm
- Addition of filament fibre VOC limit (BREF Polymers)
- Minimum recycled content of 50% staple and 20% filament fibre
- Possible exemptions from these requirements