

The dimensions of sustainable processing

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Clean
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TKT

- TKT is the Dutch technical knowledge center for the textile care industry
- TKT initiates and coordinates technical innovation projects for the Dutch and the European textile care industry
- TKT is closely affiliated to the Dutch national associations FTN (laundry) and Netex (dry cleaning), as well as CINET (the international committee of professional textile care).

The dimensions of sustainable processing

1. What is sustainability?
2. Sustainability and textile care
3. Sustainable solvent cleaning
4. Best practices in textile care
5. Professional textile care vs. domestic washing
6. Quality
7. Conclusions

1) What is sustainability?

Sustainability is not only the protection of the environment!

Sustainability is about **us** and the **earth** !

Sustainability is often described by the **3 P's**



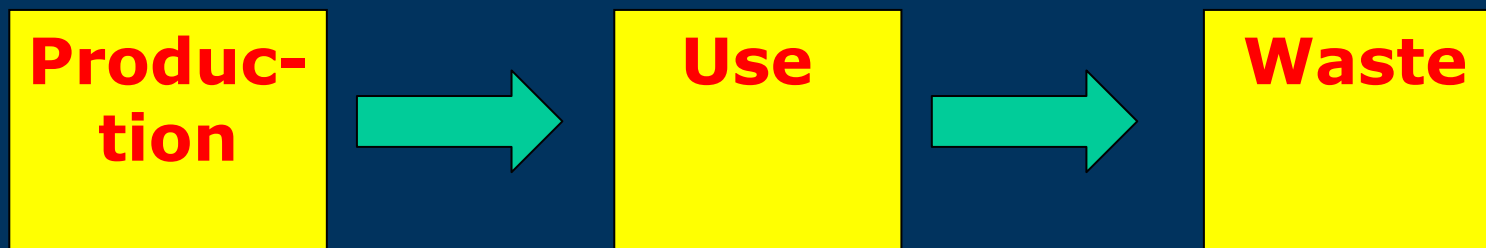
1) What is sustainability?

The 3 P's

- People (protection of and serving the needs of personnel, clients, and end-users)
 - Safe products and a safe and healthy working environment
 - Good product quality
- Planet (limited use of natural resources)
 - Natural resources: Water, energy, textiles,
- Profit (continuity of the business)
 - Profit is the reason of existence of a company
 - No profit, no future for the company !

2) Sustainability and textile care

The life cycle of most articles, e.g. a disposable:



2) The sustainability of textile cleaning

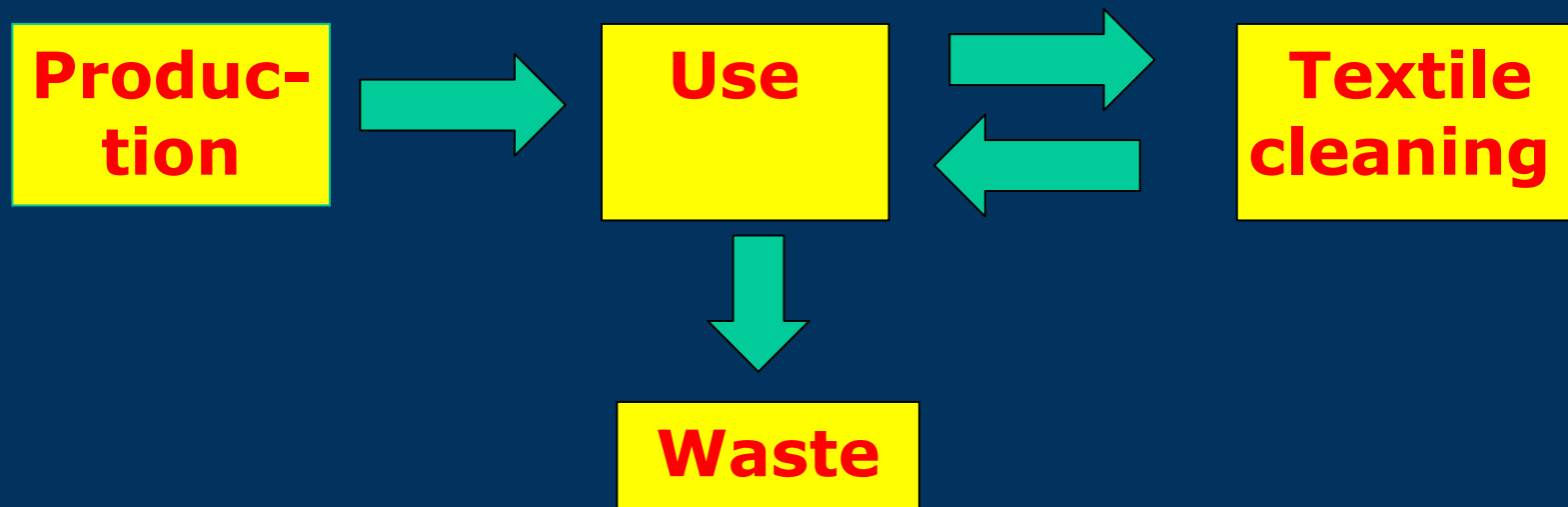
What is the aim of textile cleaning?

Making a dirty and worn piece of garment ready and fit for re-use again by :

- Removing soil and dirt
- Removing crease and wrinkles
- Bringing the garment back into shape
- Bring it back to the as-new state!

2) The sustainability of textile cleaning

This results in the following life cycle of a garment:



2) The sustainability of textile cleaning

Conclusion:

The textile cleaning industry offers the end-user the possibility to **recycle** its garments **without** the **loss of functionality!**

The cleaning step enables a much longer lifetime of the garments

Only eventually, after a series of cleaning cycles, the garments will be worn-out and must be disposed of.

3) Sustainable solvent cleaning

The European Solvent Directive demands that the total emission of a volatile organic solvent (VOC) should be less than 20 g / kg of cleaned textile.

The European Solvent Directive has to be applied for the most common dry cleaning solvents:

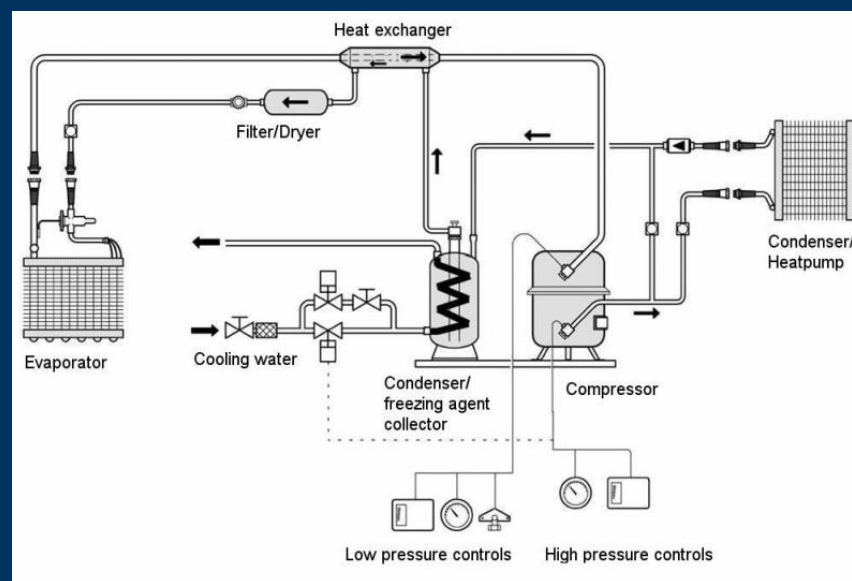
- perchloroethylene (perc)
- hydrocarbons (HCS)
- siloxane D5.

The demands of the Solvent Directive can be met by modern solvent cleaning machinery and proper working methods.

3) Sustainable solvent cleaning

Minimizing solvent emissions to the atmosphere

The main source of perc or solvent emission to the air is the drying process. The emission can be limited by the use of modern machinery with a deep-cooling system and automatic loading door interlocking .



3) Sustainable solvent cleaning

Historical development of solvent emission :

Machine generation	Perc-emission in g/kg garments
1	>110
2	110
3	50
4	20
5	10

3) Sustainable solvent cleaning

Solvent recycling

The “**continuous recycling**” of the **cleaning solvents** in the solvent cleaning process is very important to lower the solvent consumption.

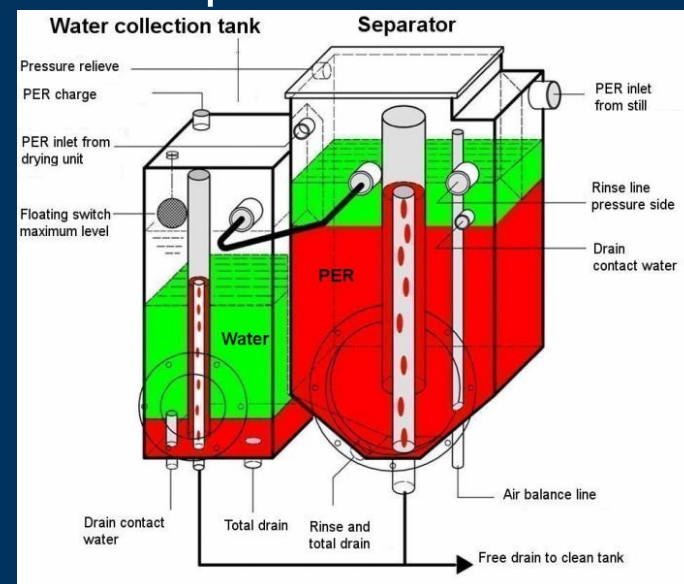
The internally recycling of the solvent is enabled by the internal solvent distillation system.

Internal solvent recycling by distillation is applied for all common dry cleaning solvents (perc, HCS, and siloxane D5)

3) Sustainable solvent cleaning

The soil and dirt are separated from the solvent by distillation and taken out of the machine (residue).

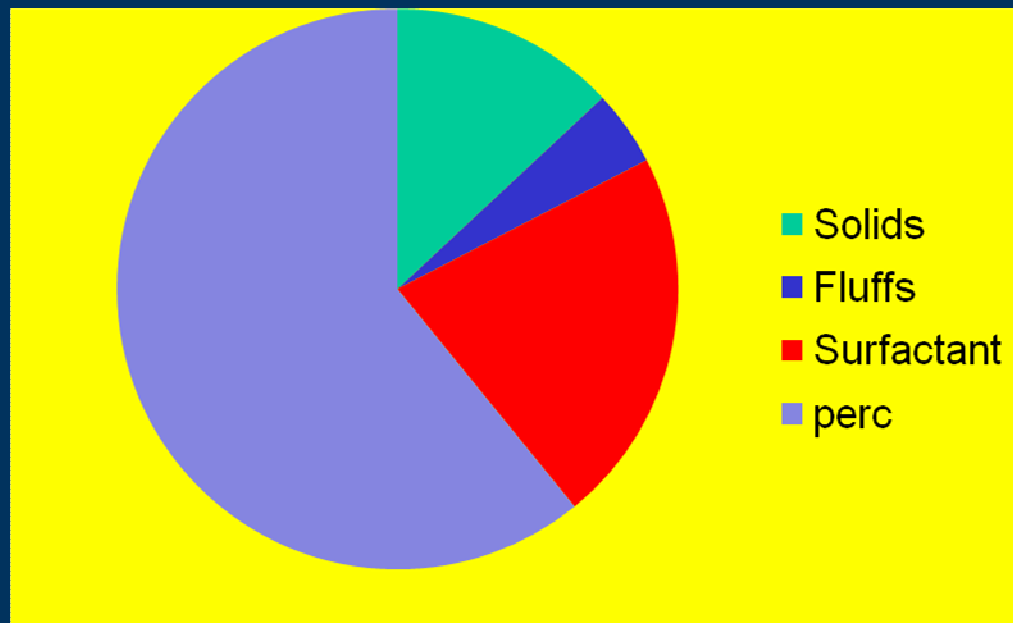
Thereafter, the solvent and water are separated in the water separator (see picture) and the solvent is clean and ready for re-use in the cleaning process again.



3) Sustainable solvent cleaning

The still residue contains the soil and dirt, detergent residues, fibers and some of the solvent.

Example of residue composition:



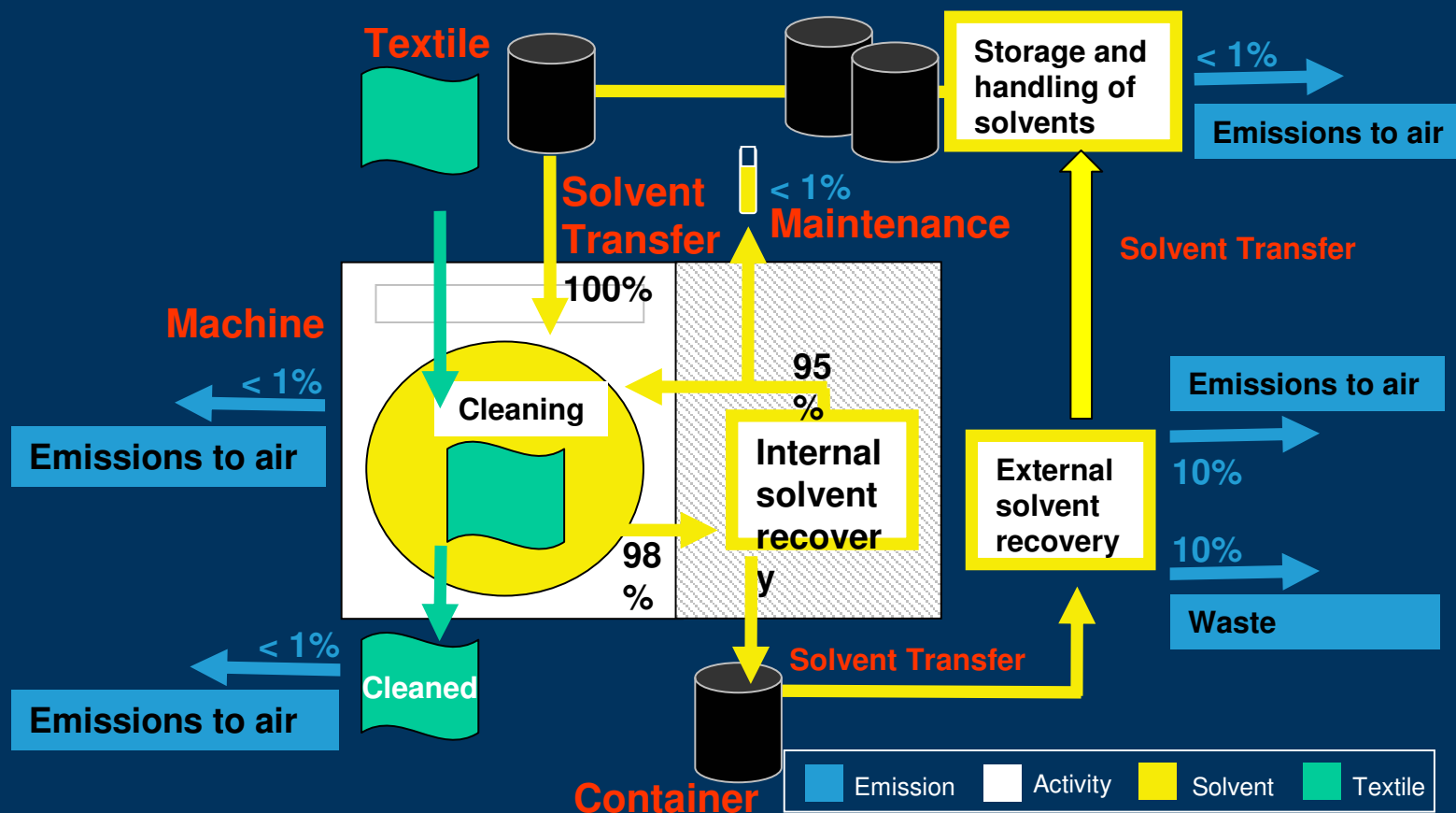
3) Sustainable solvent cleaning

So, the still residue contains a considerable amount of solvent. The still residue is therefore collected by specialized waste processing companies for further processing.

If the solvent from the still is processed in such a way that the solvent is fit for re-use in textile cleaning, the solvent cycle can be closed.



3) Sustainable solvent cleaning



3) Best practices in textile care

However:

Good housekeeping and best practices are necessary and for optimal processing in textile care.

Modern equipment alone is not enough.

So :

Personnel should be well trained and educated to enable best Practices

Therefore CINET and a large number of European associations have developed the e-learning program EDryClean for the professional textile care business

3) Best practices in textile care

What is EDryClean?

EDryClean is an international initiative to create practical and easily accessible education material especially for the international dry cleaning industry.

The didactical concept is based on e-learning and/or blended learning.

The aim of EDryClean is to provide the students with up-to-date knowledge of modern dry cleaning technology and best practices for sustainable dry cleaning.

Check the website : <http://www.cinet-online.net/edryclean>

4) Best practices in textile care

Minimizing solvent emissions to the atmosphere

Examples of good-housekeeping measures to prevent excess emission are :

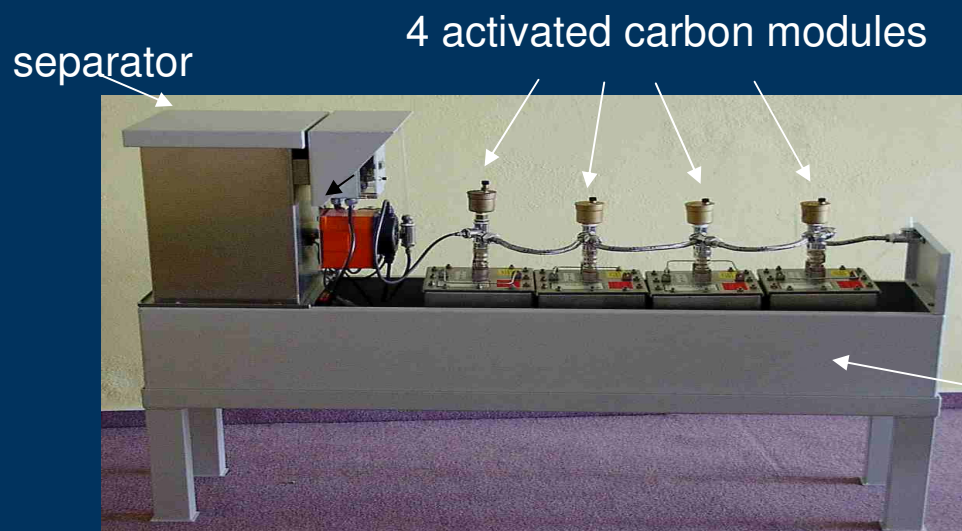
- In-time replacement of active carbon filters
- If necessary, adapt drying time to the cleaned garments. Thick garments do need extra drying time (e.g. velvet curtains)
- Avoid overloading of the machine
- Proper maintenance and control of the machine (e.g. of the deep-cooling-system)



4) Best practices in textile care

Examples of measures to minimize solvent emissions to the water

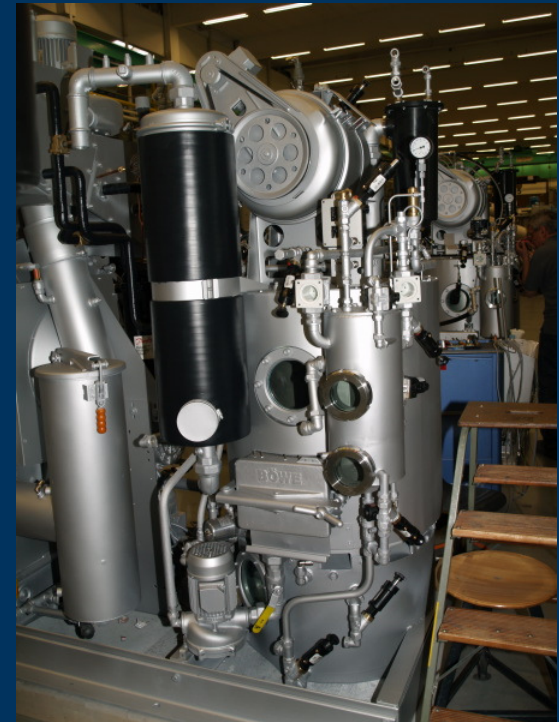
- Contact water collection by specialized waste company
- Contact water treatment on site



4) Best practices in textile care

Minimizing risk of soil contamination :

The major measures to prevent soil contamination are a **liquid impermeable floor** in the dry cleaning shop or the use of a **leak collector** in which the solvent dry cleaning machine is placed. This will prevent leakage of solvent from the machine into the soil.



5) Professional textile care vs. domestic laundering

In 2010- 2011, TKT and TNO (an independent Dutch institute for applied science) performed an research project to compare the environmental burden of professional textile care with that of domestic laundering.

Problem:

How to compare two completely different process, e.g. how to compare the environmental burden of solvent emission with that of waste water?

5) Professional textile care vs. domestic laundering

Solution:

The method used is the method of the shadow costs. Based on data in the Simapro-database the environmental burden of the different aspects of a process are expressed in Euro's (in the US: \$). This enables us to compare e.g. water pollution and solvent emission.

We all know how to compare Euro's or dollars !

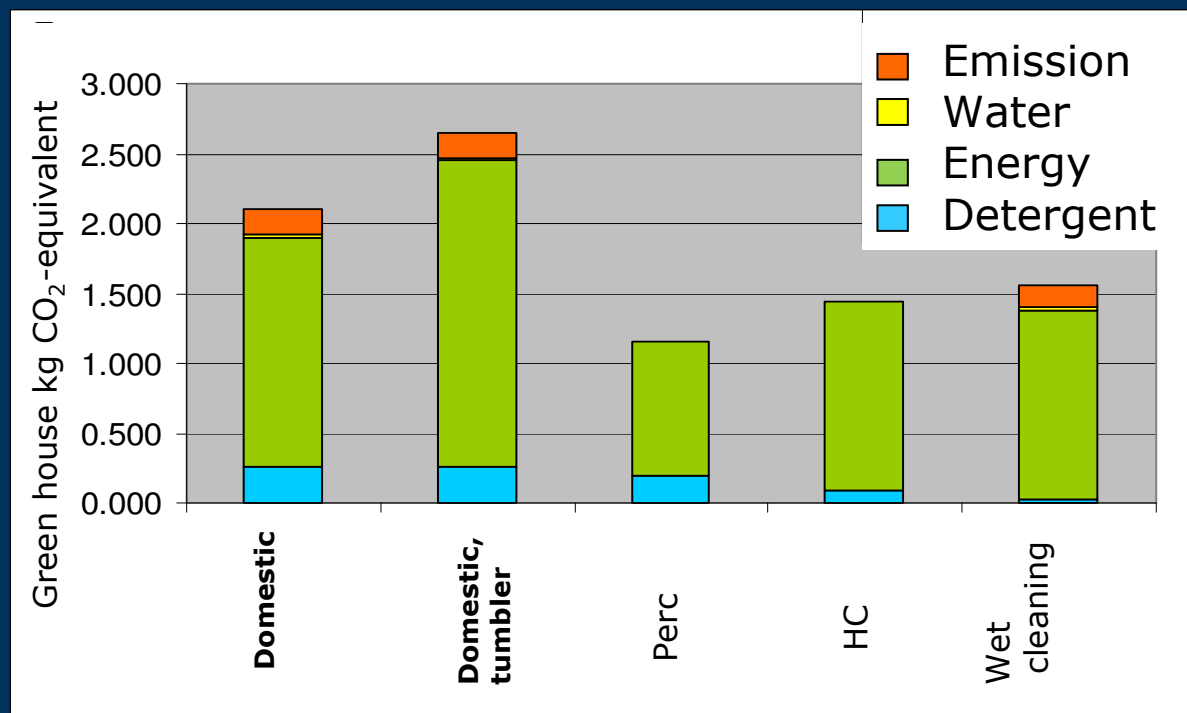
5) Professional textile care vs. domestic laundering

Environmental aspects examined in the comparison :

- Green house effect
- Energy
- Climate change
- Ozone layer
- Human toxicity
- Aquatic and marine ecotoxicity
- Terrestrial ecotoxicity
- Formation of photochemical oxidants
- Acidification
- Exhaustion of abiotic raw materials
- Eutrophication

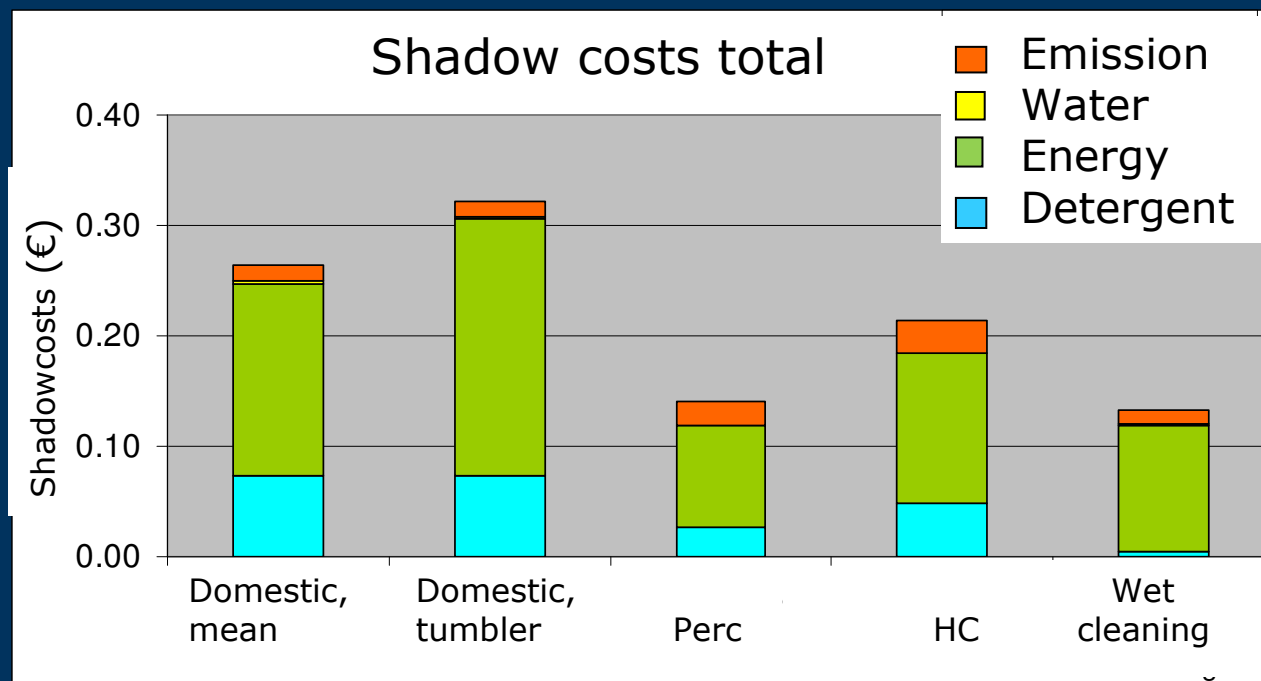
5) Professional textile care vs. domestic laundering

Example : Greenhouse effect



5) Professional textile care vs. domestic laundering

Result: Shadow costs total



5) Professional textile care vs. domestic laundering

Conclusions:

The environmental impact of domestic laundering is up to twice as high as the environmental impact of professional textile cleaning, when the best practices in professional textile care are applied.

The main contribution to the environmental impact in all processes is energy.

6) Quality

Quality is a key factor to success !

- Product quality
- Environmental care/sustainability
- Service

But how can the cleaner show that he is offering high quality services?

6) Quality

Certification is an excellent way to express quality and to differentiate:



7) Conclusions

Textile cleaning is an eminent example of a sustainable activity, which makes it possible to clean textiles without loss of quality, and return it to the customer for re-use again.

The environmental impact of domestic laundering is up to twice as high as the environmental impact of professional textile cleaning, when the best practices in professional textile care are applied.

The textile cleaner offers service on a high quality level.

Thank you for your attention!

Questions?