

# The key to a sustainable and profitable future

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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 key to a sustainable and profitable future

1. What is sustainability?
2. Sustainability of textile services
3. Textile service vs. domestic laundering
4. Textile service vs. OPL
5. Refunctionalisation
6. 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**



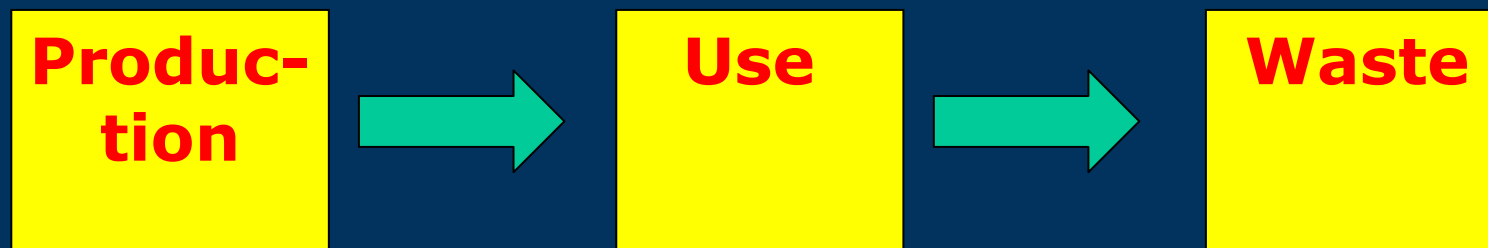
# 1) What is sustainability?

## 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 services

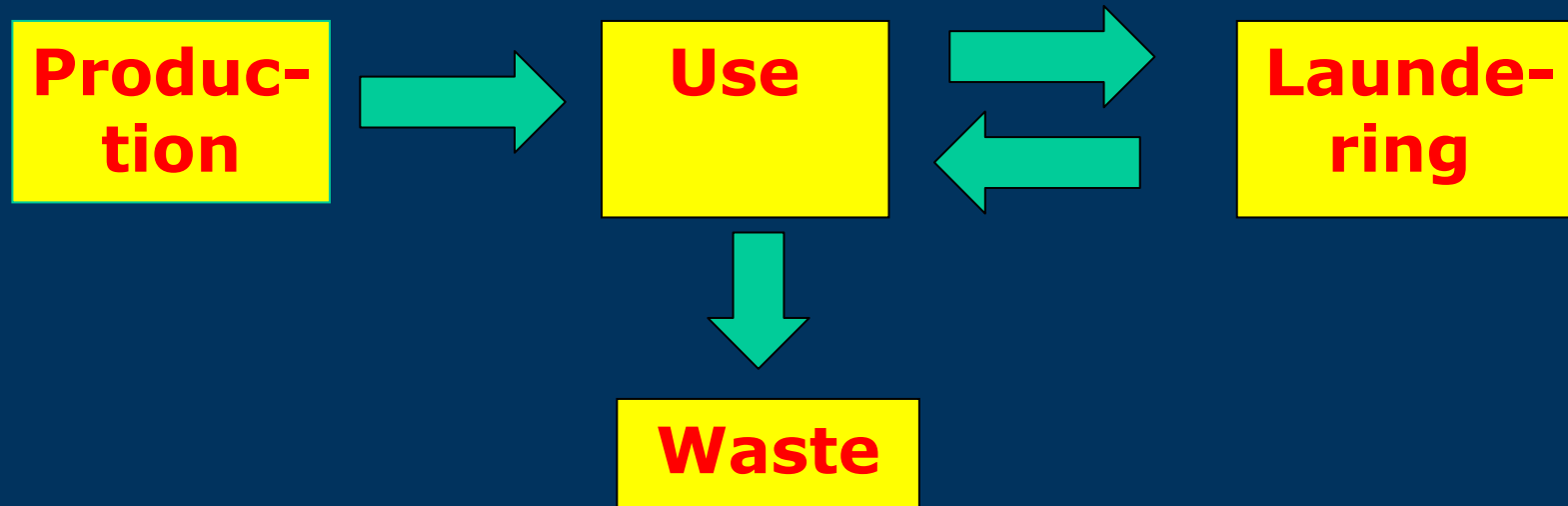
What is the aim of textile service ?

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 services

This results in the following life cycle of a garment:



## 2) The sustainability of textile services

### Conclusion:

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

The cleaning step enables a much longer lifetime of the textile products

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

### 3) Textile service vs. domestic laundering

In 2010- 2011, TKT and TNO (an independent Dutch institute for applied science) performed a research project to compare the energy consumption of professional textile service to that of domestic laundering.

For this project, representative processes for as well industrial laundering as domestic laundering were selected. Work wear for industry and health care were selected as case.

### 3) Textile service vs. domestic laundering

In domestic laundering, the energy consumption is a strong function of the washing temperature and the use of a tumble dryer:

Washing temperature	Energy consumption with tumble dryer (MJ/kg)	Energy consumption mean (MJ/kg)
40 °C	8,6	6,2
60 °C	9,7	7,4
92 °C	11,7	9,4

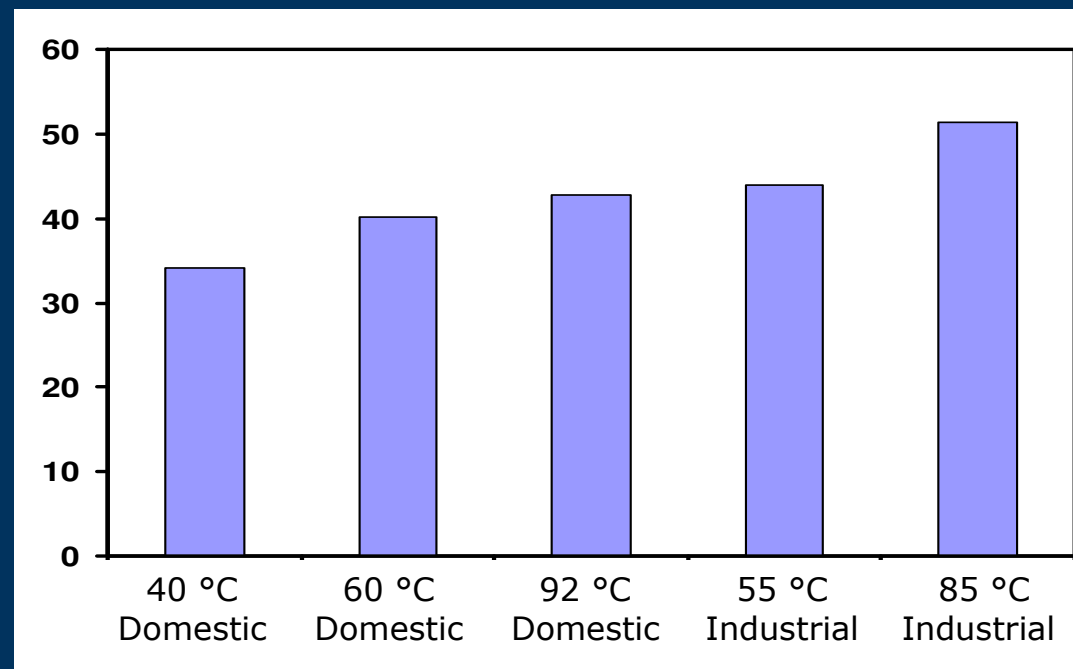
### 3) Textile service vs. domestic laundering

For the industrial processes, representative figures from industry were used:

Process	Energy consumption industrial washing process (MJ/kg)	Energy consumption industrial drying process (MJ/kg)	Totaal energy consumption (MJ/kg)
Work wear Industry Open end machines	2,1	2,6	4,7
Work wear Health Care CBW	1,5	2,6	4,1

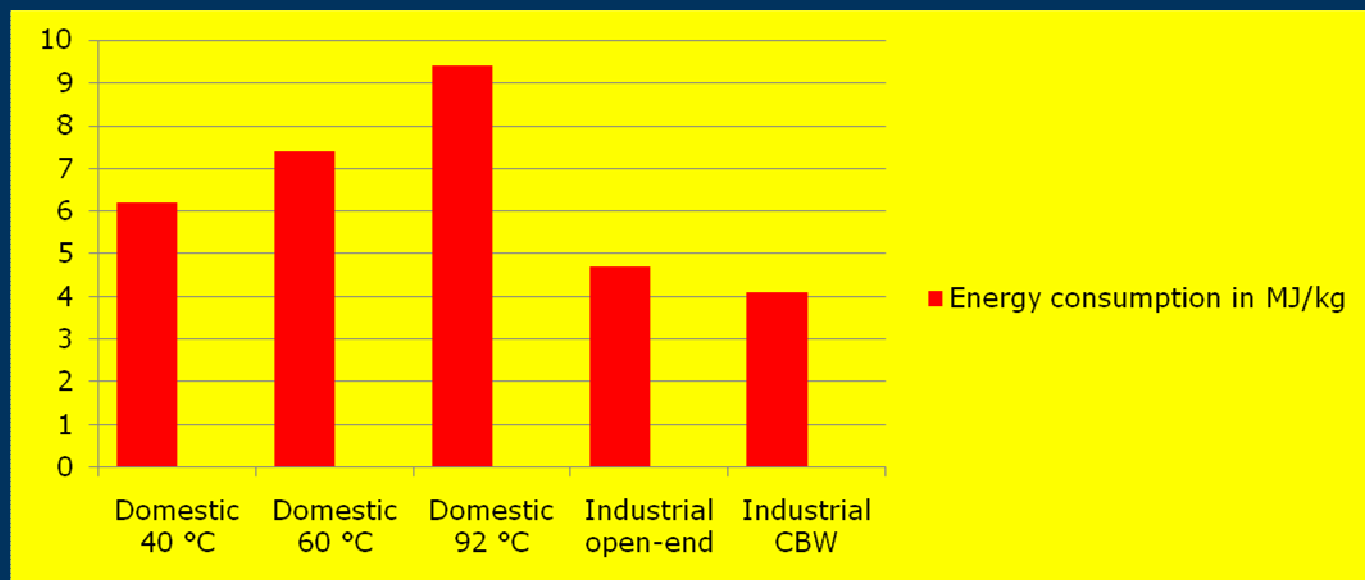
### 3) Textile service vs. domestic laundering

Stain removal in domestic laundering is less than in industrial laundering :



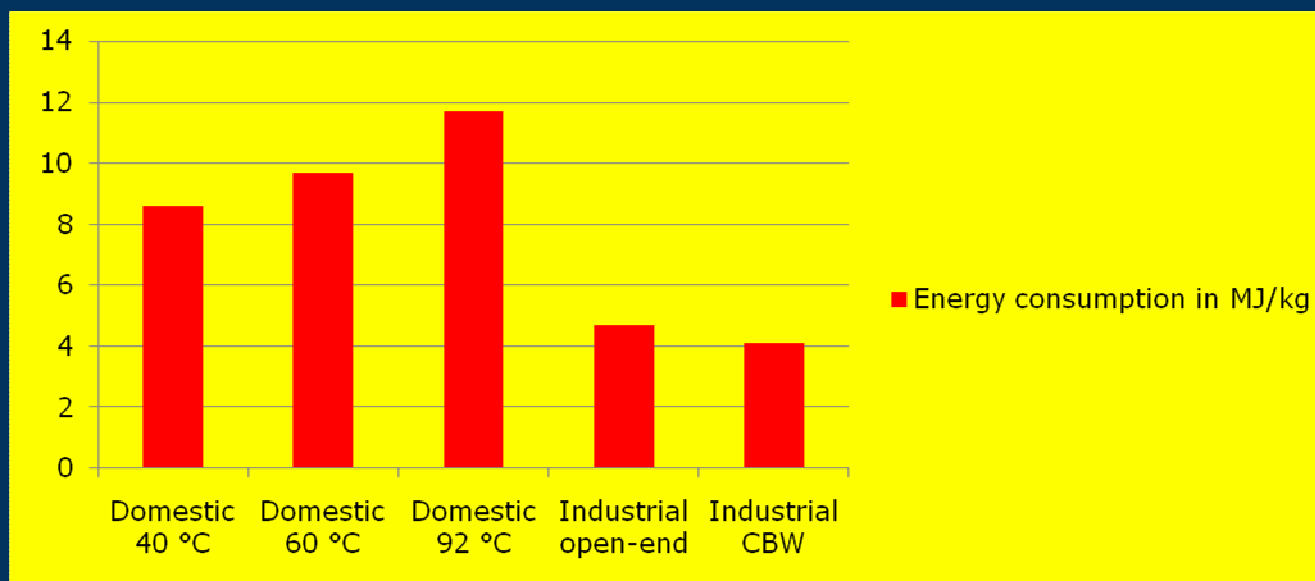
### 3) Textile service vs. domestic laundering

Industrial energy consumption compared with mean energy consumption of domestic laundering:



### 3) Textile service vs. domestic laundering

Industrial energy consumption compared with energy consumption of domestic laundering (incl. tumble drying):



### 3) Textile service vs. domestic laundering

Conclusion:

The energy consumption of industrial laundering is up to 3 times lower than that of domestic laundering

Stain removal of domestic laundering at temperatures below 90 °C is less than that of industrial laundering

## 4) Textile service vs. OPL

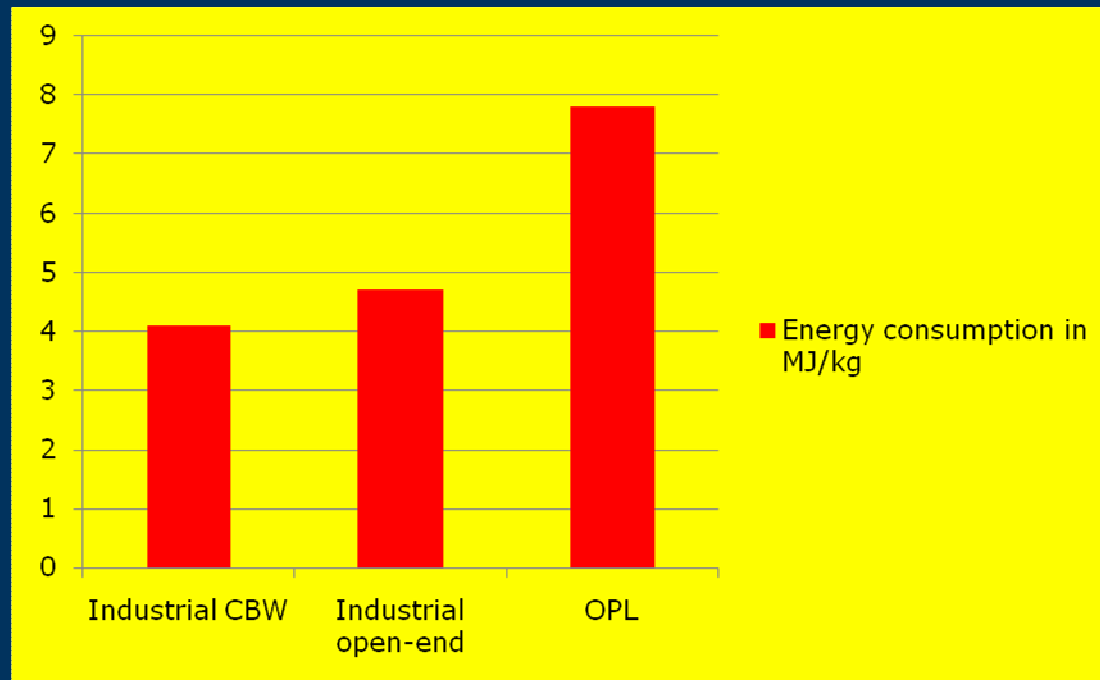
OPL (On Premise Laundry), laundry at the site of the user, is an alternative to industrial textile services.

In 2010- 2011, TKT and TNO performed also a research project to compare the energy consumption of professional textile service with that of OPL.

The energy consumption of industrial laundering was based on the same representative processes as used in the domestic laundering project. The energy consumption for OPL was the mean of the energy consumption measured at OPL 5 sites.

## 4) Textile service vs. OPL

Results:



## 4) Textile service vs. OPL

Conclusion:

The energy consumption of OPL is on average 1.7 times than that of industrial laundering.

## 5) Refunctionalisation

What again is the aim of textile service?

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!

## 5) Refunctionalisation

The possibilities for textile functionalisation are growing as a result of massive developments in textile materials and technology

However a guaranteed level of functionality after x washing cycles is almost impossible to deliver.

This is a result of the current market situation:

- Functionalisation at the textile manufacturer
- Textile care at the laundry

## 5) Refunctionalisation

Why?

- Level of functionality decreases during use
- Representative sampling is complicated, or even impossible in laundries
- No control of behavior of the end-user (e.g. in-between domestic laundering)
- Solution: Refunctionalisation !!

## 5) Refunctionalisation

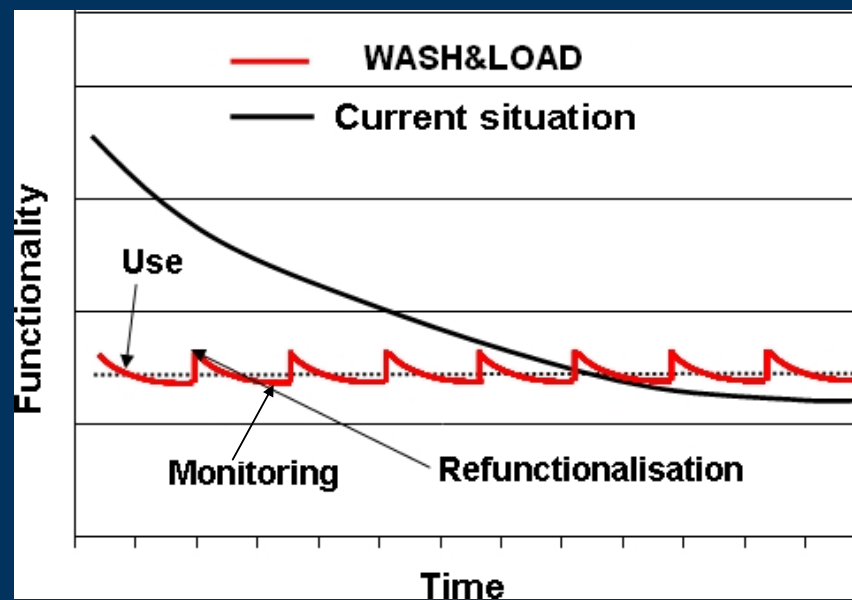
Refunctionalisation is the re-application or refreshing of textile functionalities as part of the laundry process, making the textile 100% fit for re-use again.

Examples of functions are:

- Antimicrobial
- Antistatic
- Soil repellent
- Fire retardant
- UV-protection
- .....
- .....

## 5) Refunctionalisation

Graphical representation of the effect of refunctionalisation :



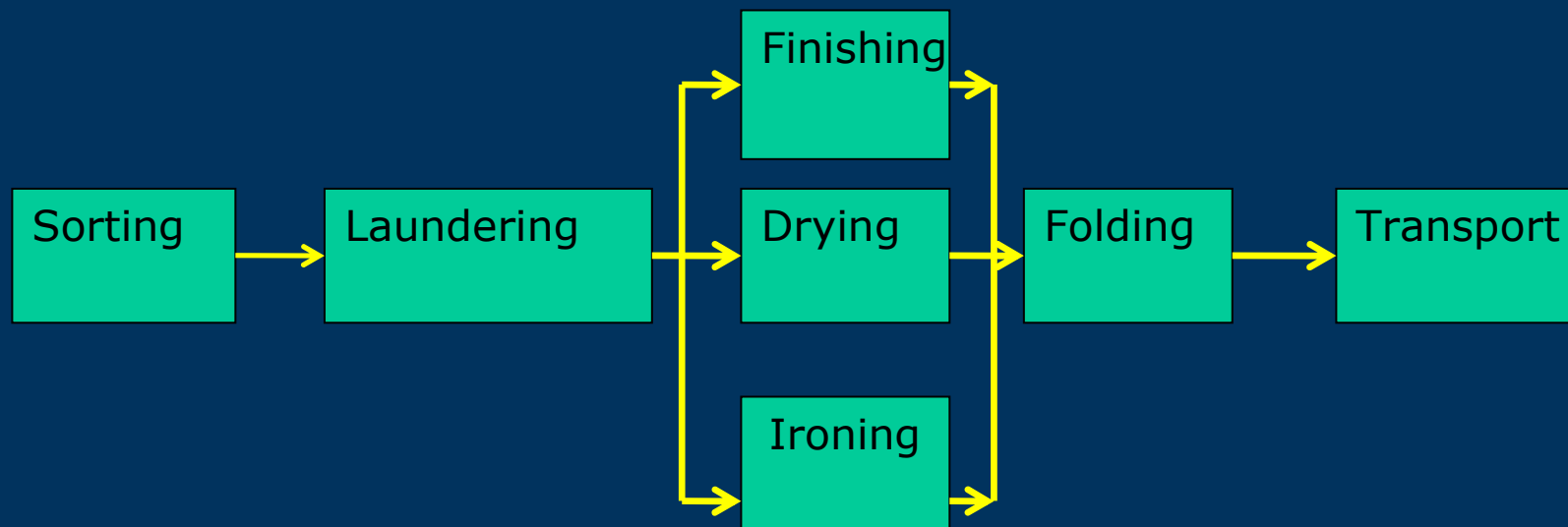
## 5) Refunctionalisation

Aim refunctionalisation:

- 1) Guaranteed functionality
- 2) Enlarging added value of textile service
- 3) Optimalisation of functionality for end-user  
(not more, but also not less than required)
- 4) Energy saving in the textile chain
  - Longer product life time

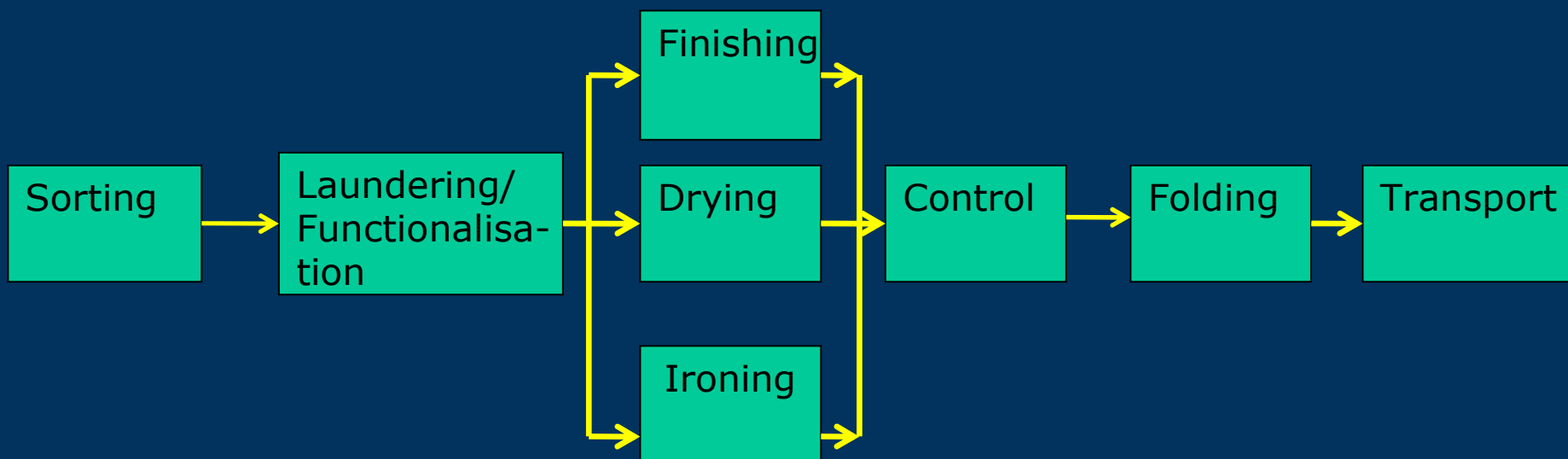
## 5) Refunctionalisation

Process scheme of a conventional laundry process



## 5) Refunctionalisation

Process scheme of a refunctionalisation process

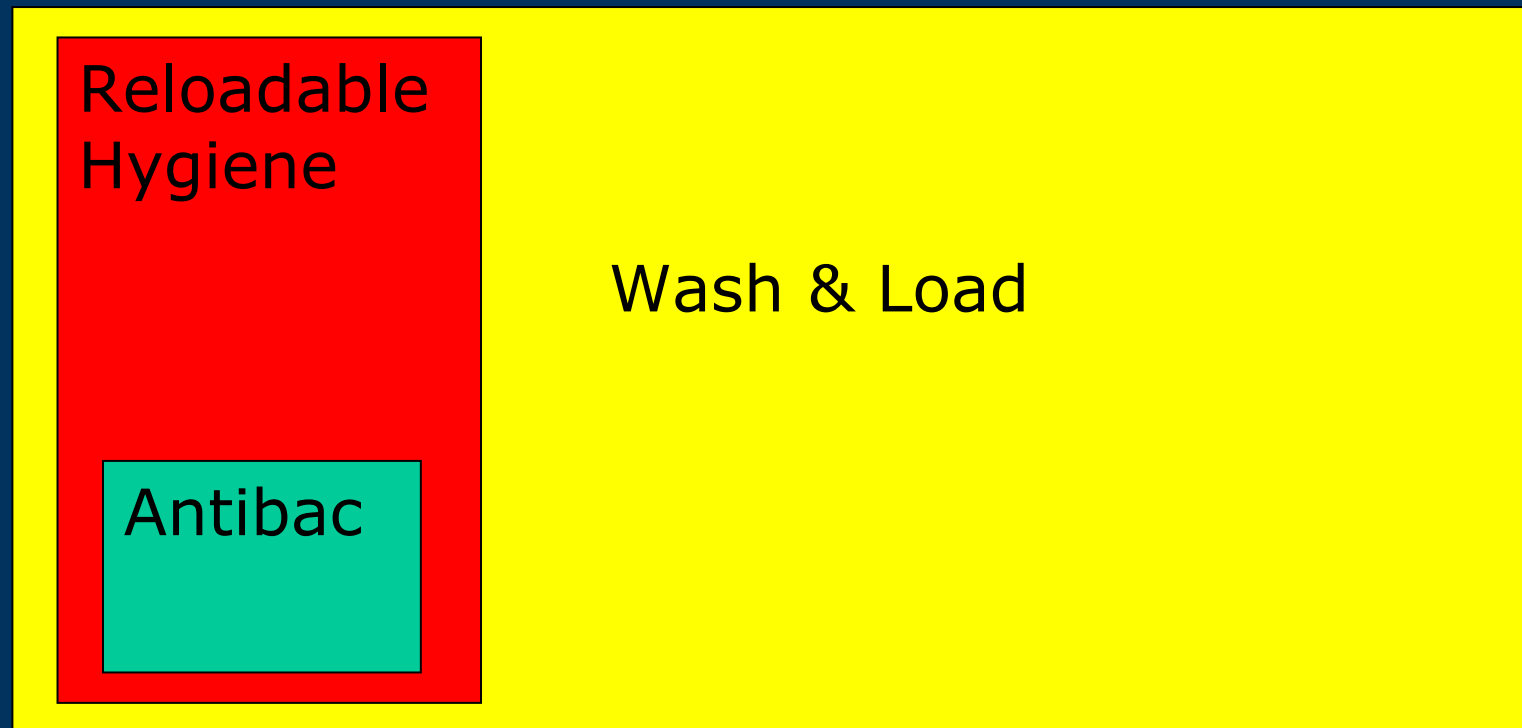


## 5) Refunctionalisation

TKT is working on three projects in the field of refunctionalisation

1. Anti-bac
  - Establishing specifications and test procedure for antimicrobial textile
2. Reloadable hygiene
  - Development of a refunctionalisation process for antimicrobial textile
3. Wash & Load
  - Development of a modular and multifunctional refunctionalisation process for the textile care industry

## 5) Refunctionalisation



## 6) Conclusions

Textile service is the most sustainable way of doing laundry, making it possible to launder textiles without loss of quality and functionality, returning it to the customer in as-new-state.

Industrial textile laundering offers a guaranteed high level of quality, which cannot be matched by the domestic laundering process.

The energy- and water consumption per kg laundry in the industrial laundering process is much lower than in domestic laundering or in OPL. For work wear for industry and health care, the professional textile service is up to 3 times more sustainable than a domestic laundering process. Compared with OPL laundering, the professional textile service is on average 1,7 times more sustainable, with peaks up to 2,2.

**Thank you for your attention!**

**Questions?**