

# Green Chemistry progression towards sustainable textiles: A Historical Perspective

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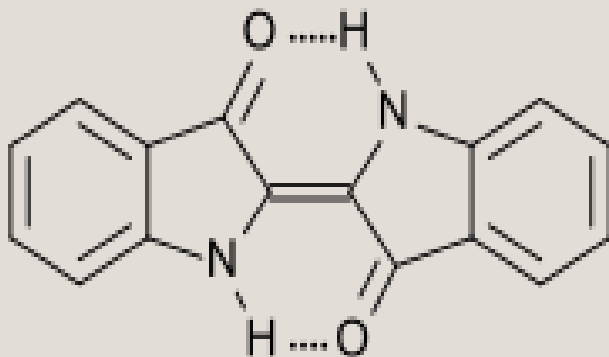
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- The Textile Industry and Chemical Industry have been linked together since the beginning of the Industrial Revolution

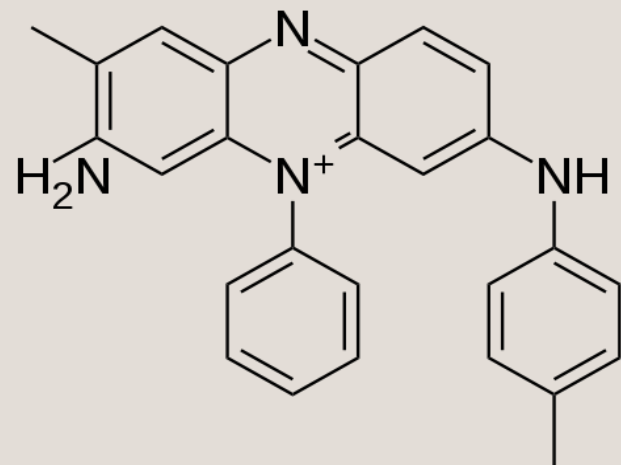
## Indigo

1878



## Mauveine

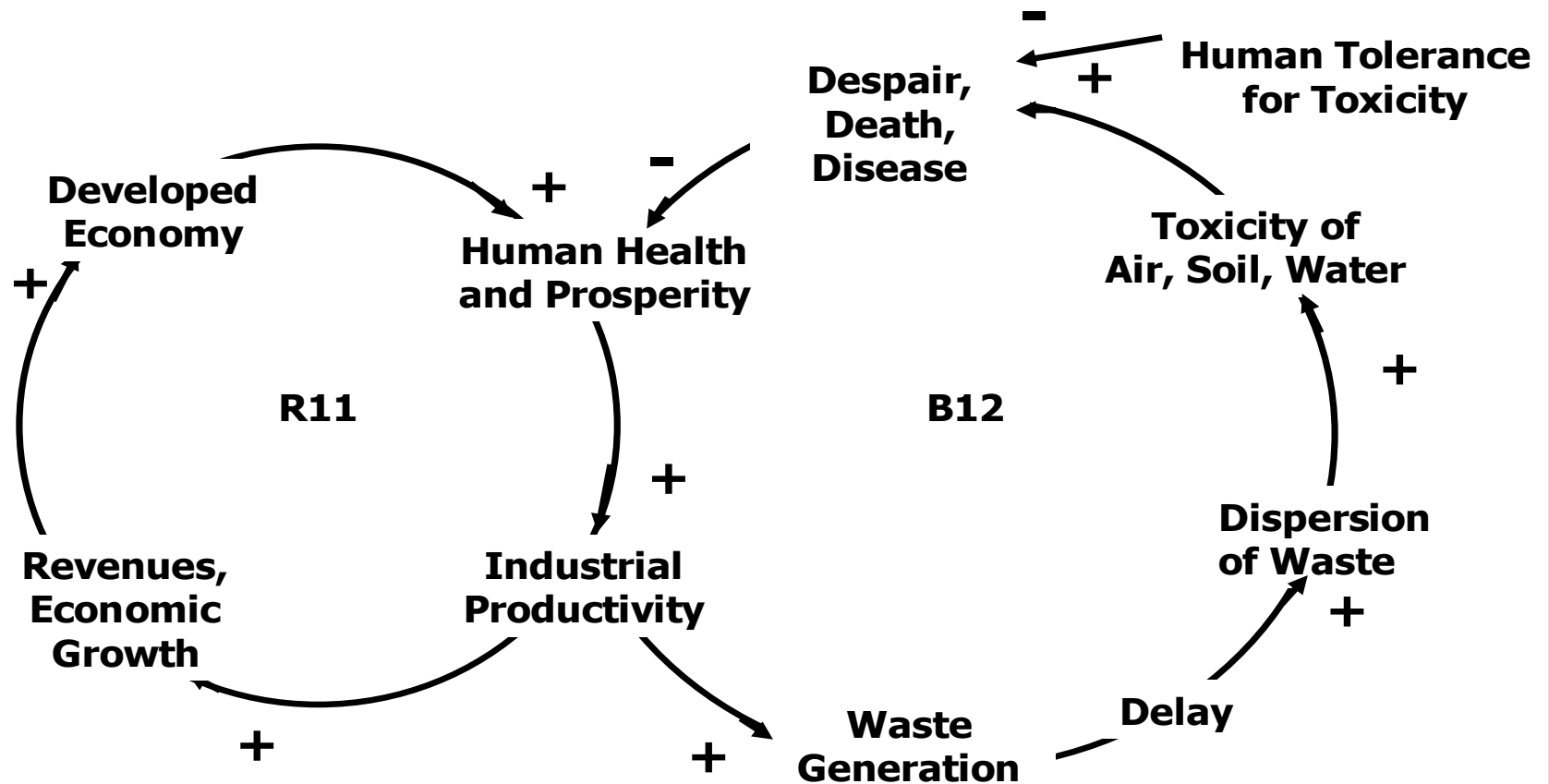
1856

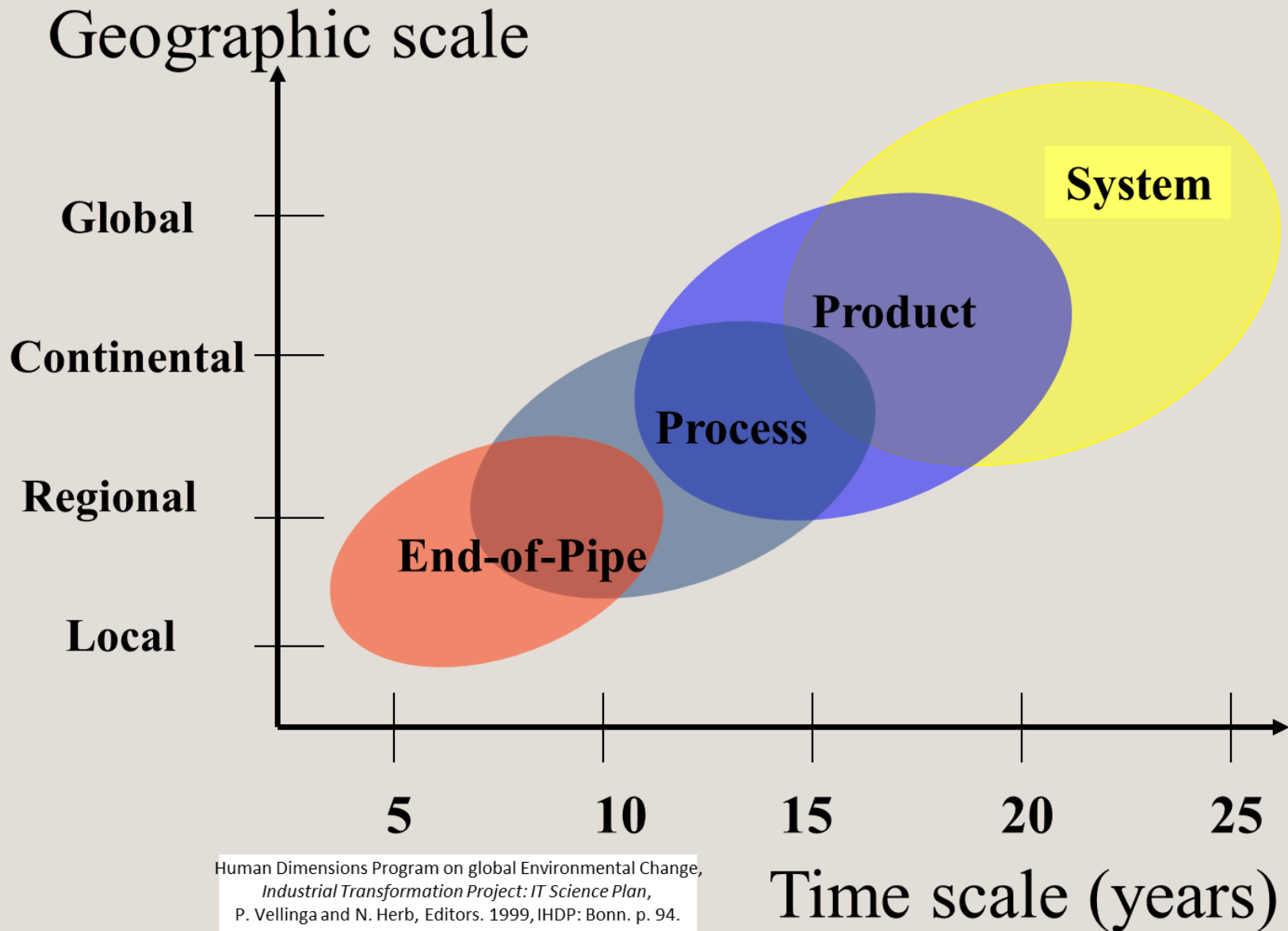


- \$720 billion : Chemicals are one of America's largest industries, a \$720 billion enterprise.
- 784,000 : The business of chemistry employs 784,000 people nationwide.
- Vital : The chemical products manufactured are an essential part of every facet of our nation's economy. Over 96% of all manufactured goods are directly touched by the business of chemistry.
- 10% of all USA exports are from the Chemical Industry
- Without the chemical industry, there could be no modern textile industry

- Textiles and Apparel sector of the global economy represents 3% of all merchandize trade.
- 10% of Global Carbon Output is textile related
- 20% of global water pollution is textile related
- 68 lbs of clothing per person is discarded to landfill in USA each year
- This represents 5% of US landfill capacity

It is estimated that over 5,000 unique compounds are used in the production of textile and apparel products.

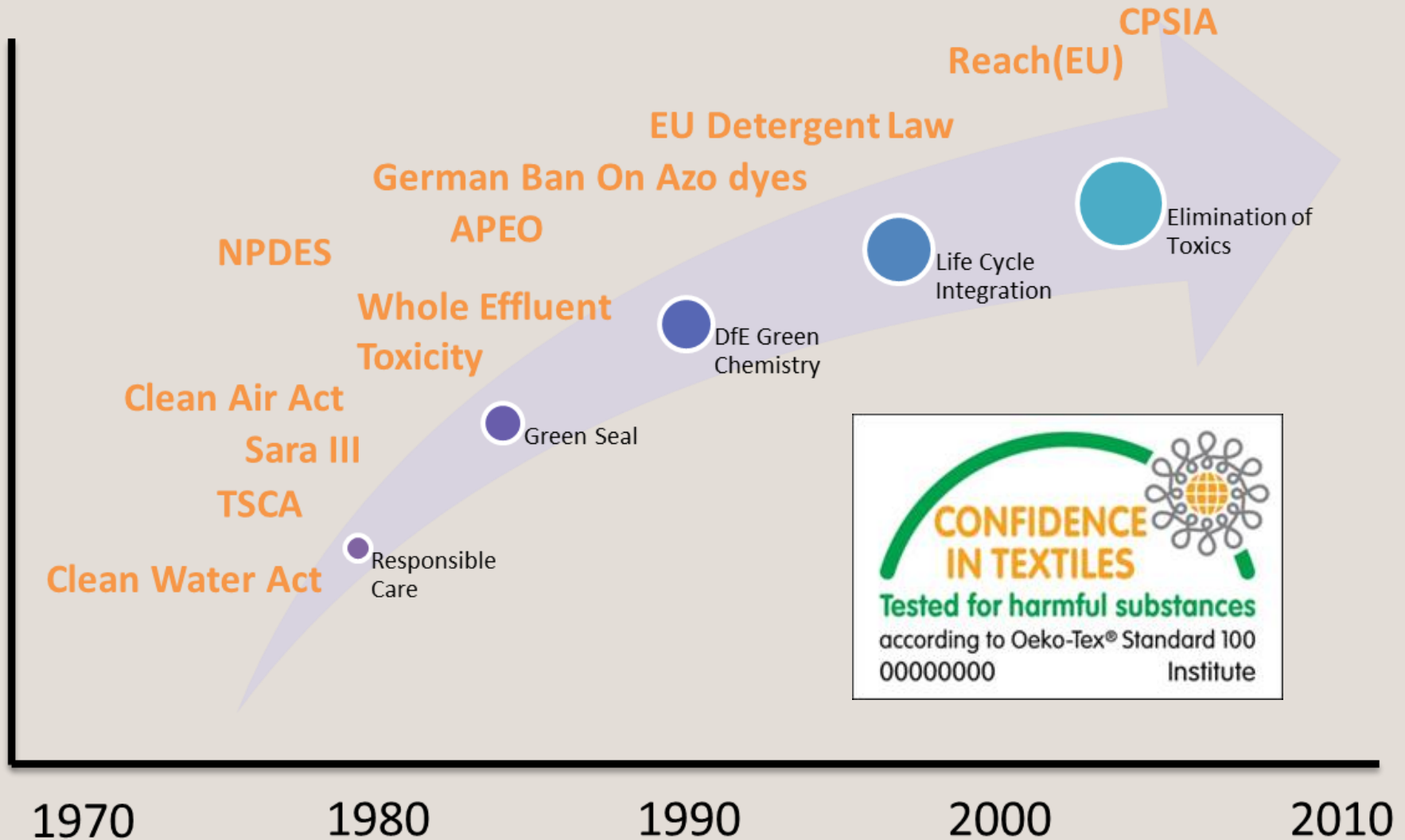
***"LIMITS TO SUCCESS" AND THE SUSTAINABILITY CHALLENGE***



- Policy drives regulations enforcing water quality criteria> Example is the USA Clean Water Act (1972)
  - First actions were building effective Wastewater treatment facilities.
  - Second actions were pollution prevention and toxics reduction via process redesign.
  - Third actions are using LCA data to redesign materials and products
  - Fourth actions may be the redesign of commerce



# Regulation Path & Societal Response HOHENSTEIN●





## product quality

- acceptable pH-value
- good colourfastness

## Substances which may be harmful to health:

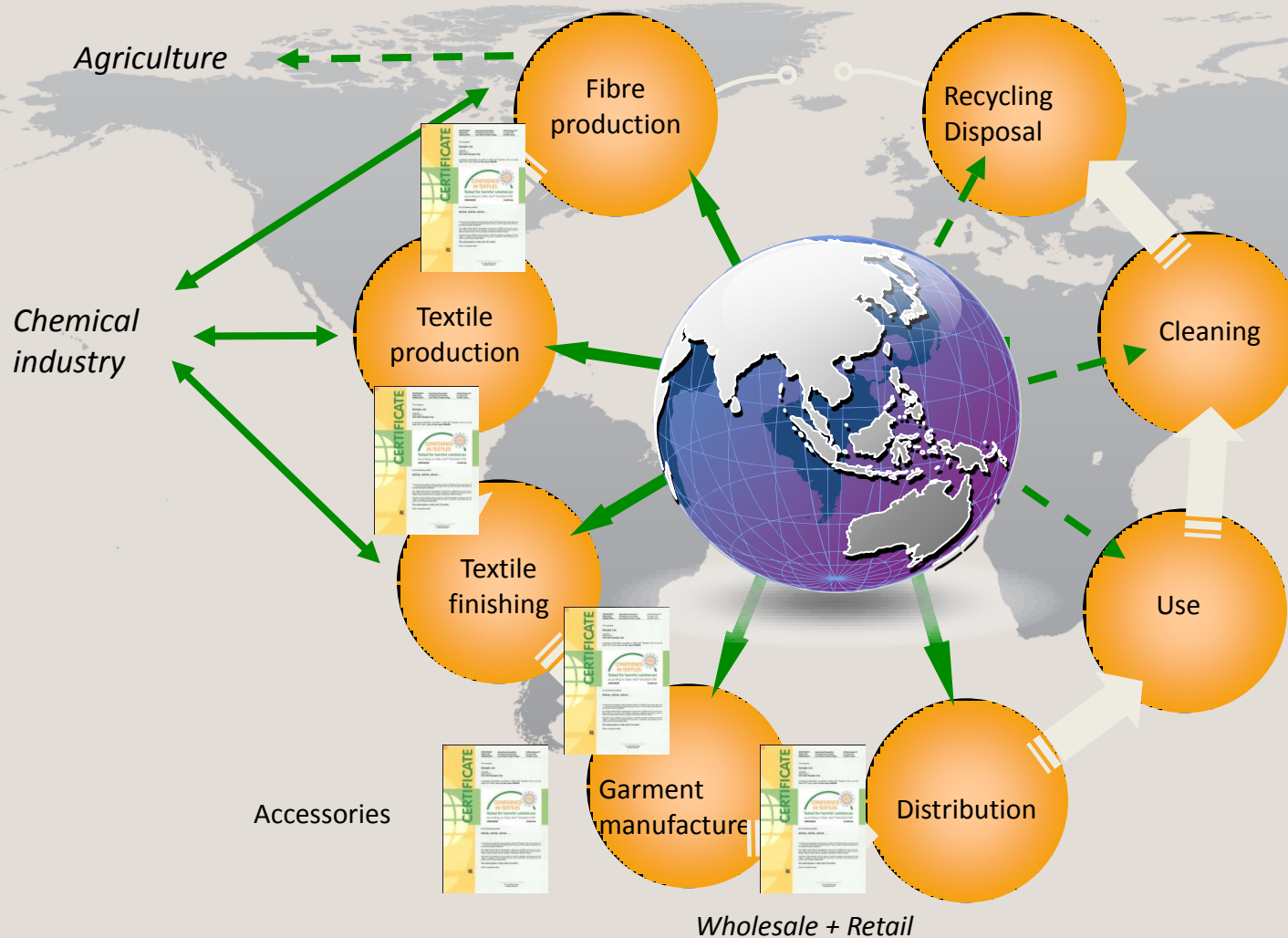
- polycyclic aromatic hydrocarbons (PAH)
- tin-organic compounds (TBT, DBT, TPhT, DOT)
- allergy-inducing dispersion dyes
- pesticides
- chlorinated benzenes and toluenes
- low emission of volatile components
- chlorinated phenols – TeCP

## Legally banned and controlled substances:

- azo-dyes
- carcinogenic dyes
- pentachlorophenol
- formaldehyde
- phthalates
- PFOS and PFOA
- heavy metals (Nickel, Chrome)
- cadmium or lead total contents
- banned flame retardant products

**Biologically active and flame-retardant substances:**  
 -> are only accepted after further evaluation by a committee of independent experts, and only in the form of ready-to-use products

# The textile world speaks OEKO-TEX®



- Textile Life Cycle Scope



- A Comprehensive Textile Standard- Social, Ecological and Product/Process Stewardship
- The only environmental certification system that is especially tailored to the textile and clothing industry



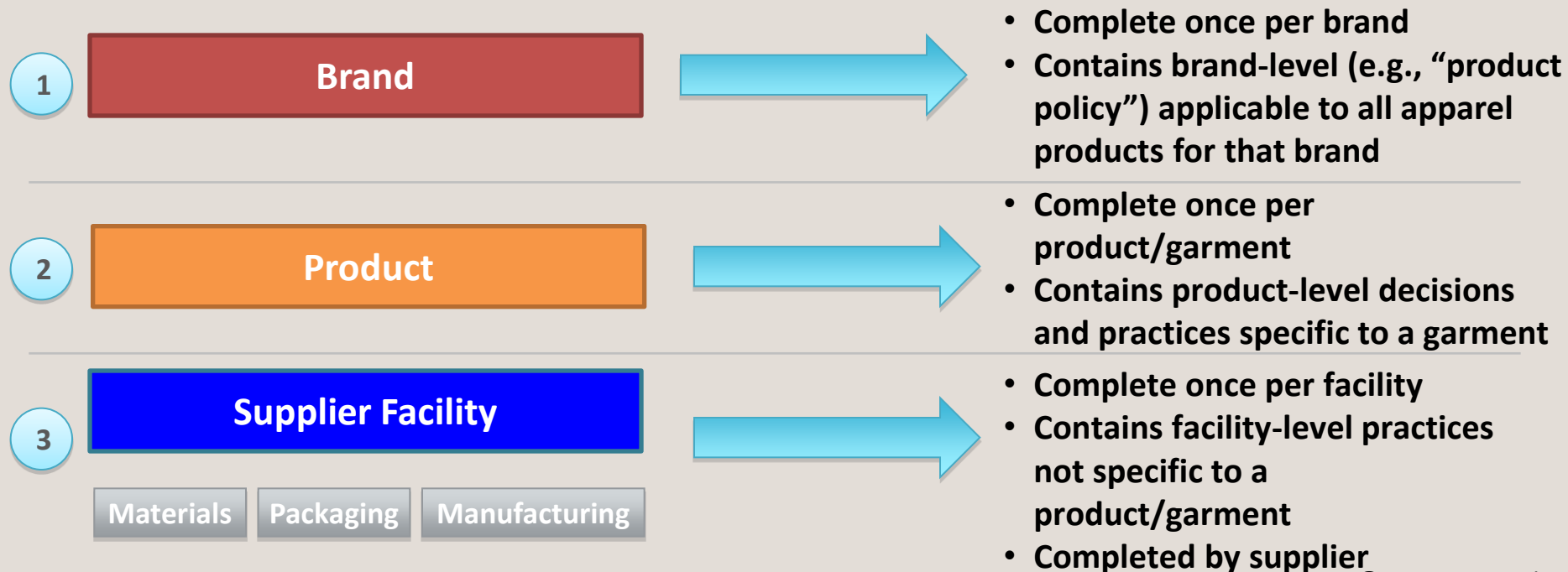


- Allows for a comprehensive assessment of an operation's environmental and social performance
  - as compared to other environmental management systems which only partially cover the relevant areas
- Full recognition of other management systems, including ISO 9000, ISO 14000, EMAS



# Index Prototype Approach

- **Employs lifecycle-based approach**
  - Accounts for product impacts up and down the supply chain
  - Useful and educational organizational structure within the Prototype



Thanks for your Kind Attention HOHENSTEIN●

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