

SUSTAINABILITY IN THE TEXTILE INDUSTRY: WHERE DO YOU GO WITH UN GOALS, CIRCULAR ECONOMY, REACH AND ECO LABELS?

Prof. Dr. Mathias Muth | Textile Printing & Sustainability Conference
Neuss, Germany | 9th September 2022



Hochschule Niederrhein
University of Applied Sciences

“Textile industry is considered to be the most hazardous environmental issue globally“

(A.K. Roy Choudhury, 2015)

“Take, make, waste”

- Take from the earth
- Make a product
- Waste after use

⇒ **“This linear model is not only harmful for the environment, it also destroys value”**

(The Ellen MacArthur Foundation, 2022)

EU strategy for sustainable and circular textiles

To create a greener, more competitive textiles sector



© European Commission 2019

The European Commission will publish a **transition pathway** by the end of 2022 – an action plan for actors in the textiles ecosystem to successfully achieve the green and digital transitions and increase its resilience.

Their **2030 Vision for Textiles** is that, for example

- all textile products placed on the EU market are durable, repairable and recyclable, to a great extent made of recycled fibres, free of hazardous substances (REACH regulation), and produced in respect of social rights and the environment
- “fast fashion” is out of fashion

Global Fashion Agenda (GFA)

- **Vision:**

Accelerate the fashion industry towards
a net positive industry for people and the planet

- **Requirements:**

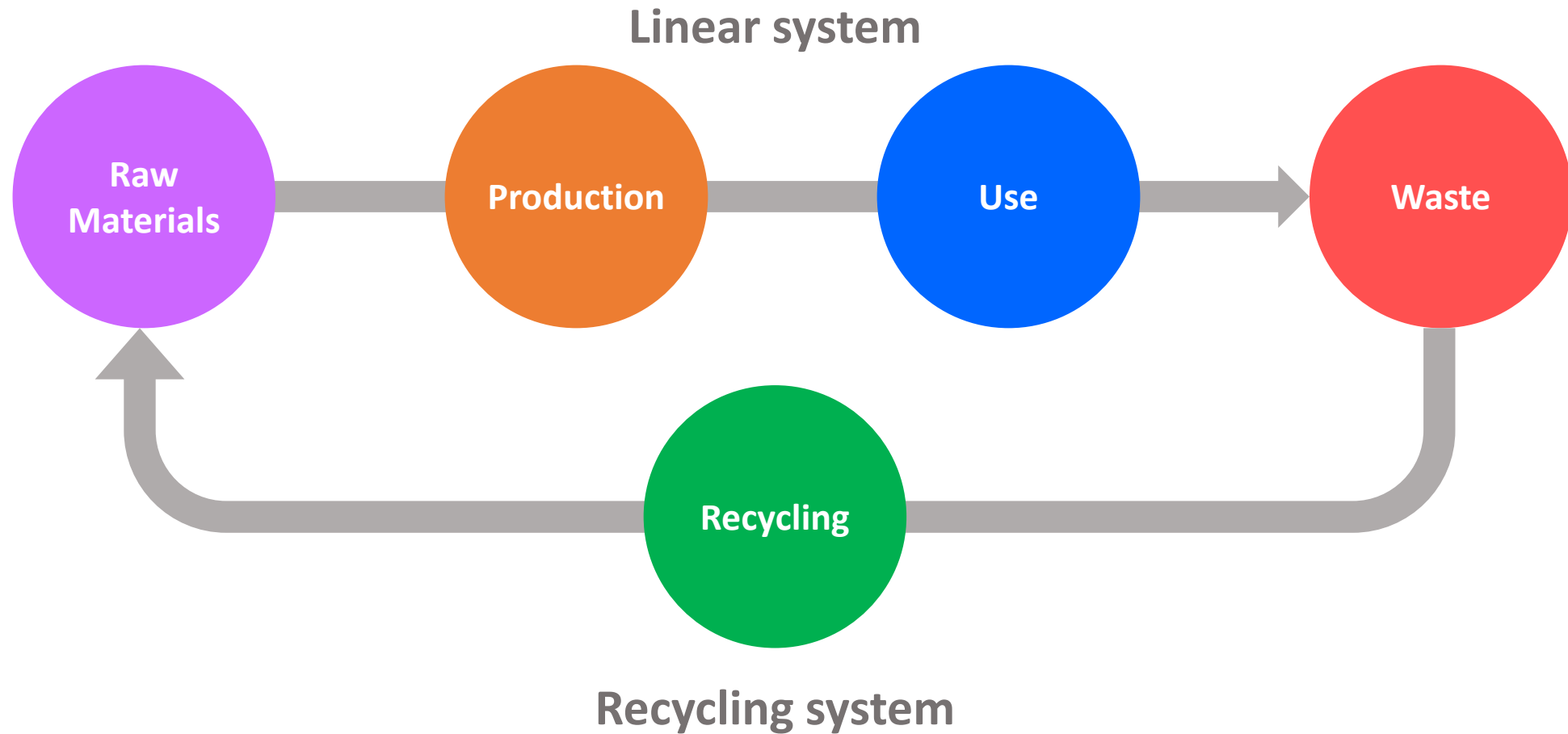
An industry **that puts back more** into society,
the environment, and the global economy **than it takes out**



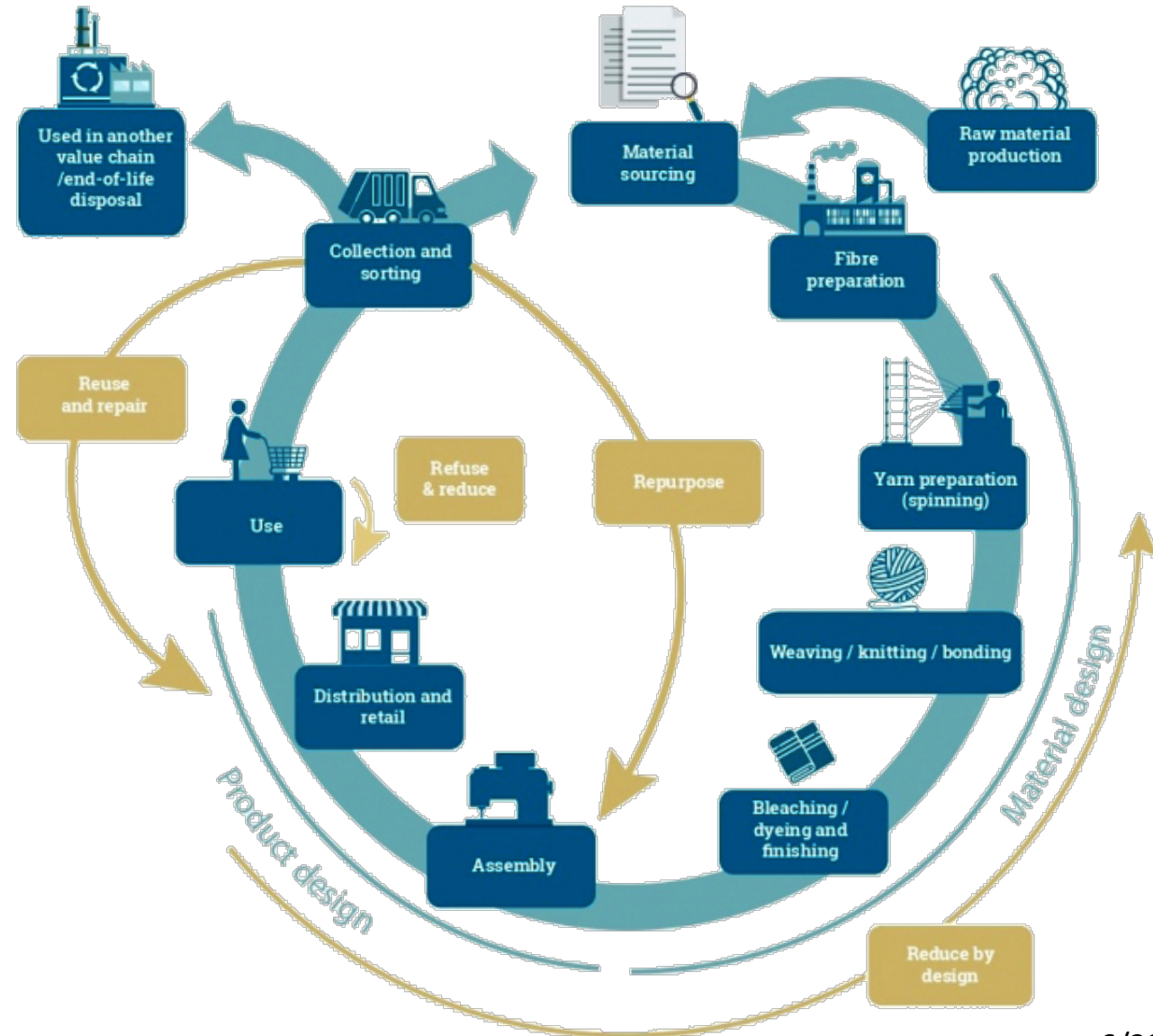
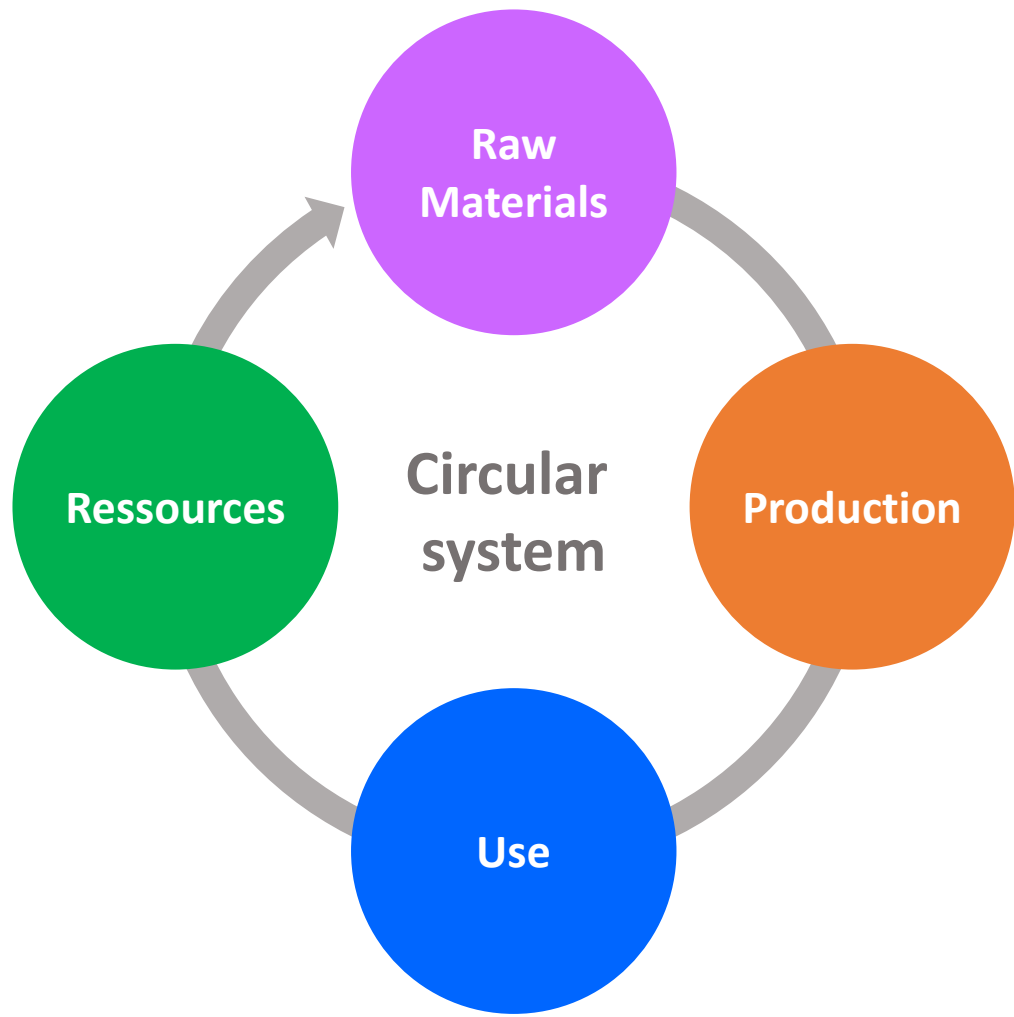
Source: <https://globalfashionagenda.org>

⇒ **Transition from linear to circular is essential and inevitable**

From linear to circular

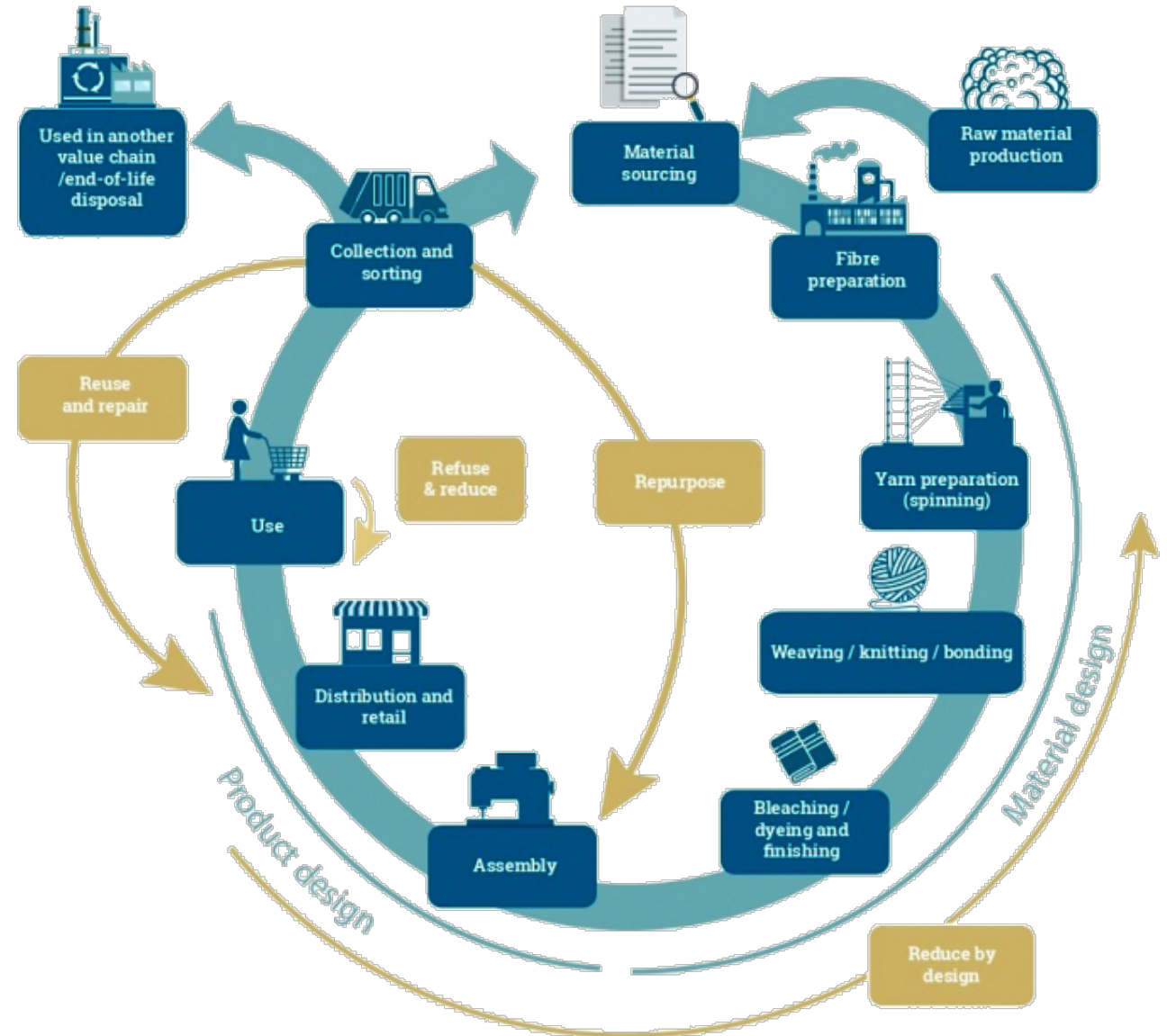


From linear to circular



Source: The United Nations Environment Programme (UNEP); <https://www.unep.org>

- “Design for recycling” is the central element of future circular systems
- End-of-life and recycling must already be considered at design stage
- All value-added stages must be taken into account



Source: The United Nations Environment Programme (UNEP); <https://www.unep.org>

Circular economy – creating textile cycles, shaping the future

(Study from *Forschungskuratorium Textil e. V., 2022*)

- Too many textiles today end up as waste too quickly
- Large amount of old clothes are exported abroad
- Lack of recycling technologies that can be used to separate mixed fabrics
- The goals are clear:
 - Reduce the amount of waste
 - Gain more sustainably overall
 - Include all stages of the value chain

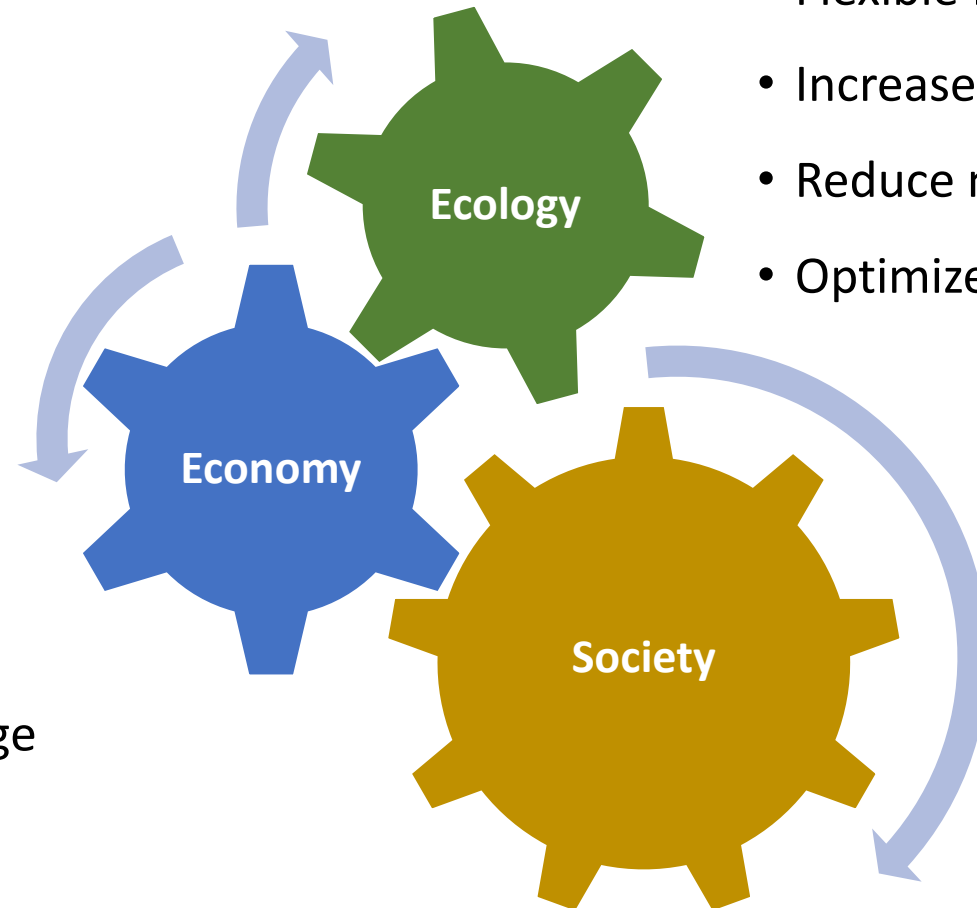
Source: *Forschungskuratorium Textil e. V., Gesamtverband textil+mode, 2022*

Challenges of establishing a circular economy

- The textile industry covers dozens of process steps and value-added stages like hardly any other industry

- **Holistic approach**

- Competitive prices
- Reduction of production surpluses
- Moving away from the fast fashion
- Digital and transparent supply chains with open data exchange



- „Design for circular economy“
- Flexible recycling technologies
- Increase longevity and durability
- Reduce material mixtures and composites
- Optimize collection and sorting systems

- Awareness of the value of clothing
- Educate consumers about the eco balance
- Strengthen on-demand consumption
- Create democratic majorities

according to the study from Forschungskuratorium Textil e. V., 2022

The Jeans Redesign

by The Ellen MacArthur Foundation (EMF), 2019

- **Making jeans that are used more, made to be made again, and made from safe and recycled or renewable inputs**
- The fashion industry to thrive, and not just survive, it needs to radically redesign its operating model and decouple financial success from natural resource consumption
- The Jeans Redesign guidelines encourage leading brands, mills, and manufacturers to transform the way jeans are made (about 100 participants to date)
- Based on the principles of a circular economy, they're a blueprint for collective action to scale circular practices

Source: <https://ellenmacarthurfoundation.org/the-jeans-redesign>

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Green Claims and Eco-Labels for Sustainable Textiles

- It is difficult for consumers, companies and other market actors to make sense of the many environmental labels and initiatives on the environmental performance of products and companies.



not existing



Green Claims Initiative (European Commission, 2022)

- As of today there are **456 ecolabels** in **199 countries**, and **25 industry sectors**, with **104 ecolabels on textiles**. (www.ecolabelindex.com, accessed on Aug 31, 2022)
 - Types of labels include the following:
 - *Eco-labels*
 - *Organic labels*
 - *Fair-trade labels*
 - *Health-related labels*
- ⇒ **Currently, there are no eco-labels in textiles and clothing enforced by mandatory rules**
- To tackle this issue, the European Green Deal states
“Companies making ‘green claims’ should substantiate these against a standard methodology to assess their impact on the environment”

Green Claims and Eco-Labels for Sustainable Textiles

Exerpt from a MSDS of a typical eco-solvent ink for digital printing



Signal Word
Danger

Hazard Statements

- H227 Combustible liquid.
- H318 Cause serious eye damage.
- H360 May damage fertility or the unborn child.
- H371 May cause damage to organs.
- H373 May cause damage to organs through prolonged or repeated exposure.
- H402 Harmful to aquatic life.

Who is Receptient? ⇒ Customer? ⇔ End-user?

Green Claim:

GREENGUARD Certification [...] provides manufacturers with credible tools to legitimize and promote their sustainability efforts.

(<https://elemental.green/what-is-greenguard-certification>)



⇒ Solvent ink received the "GREENGUARD Gold" certification

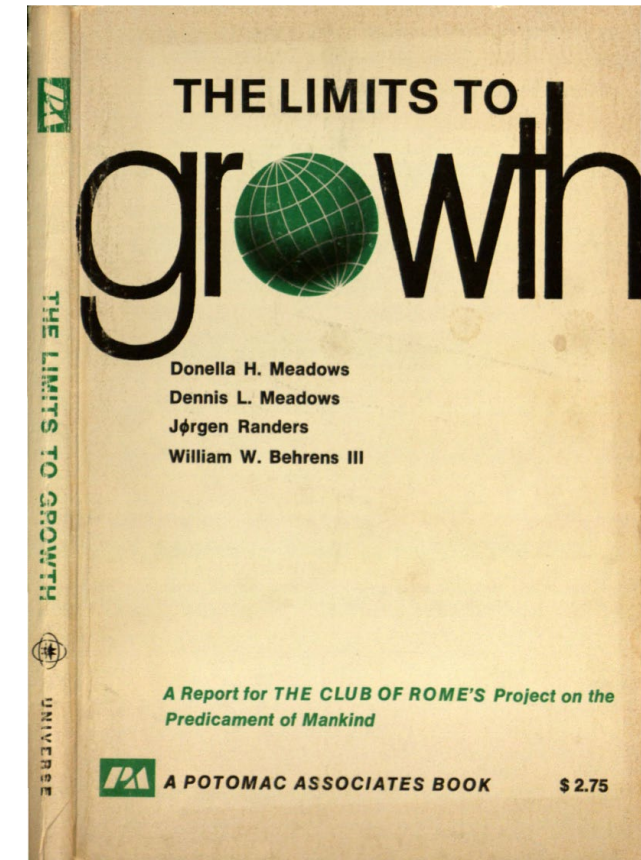
“The Limits to Growth” from 1972 – A Report for The Club of Rome’s Project on the Predicament of Mankind

- **Conclusions:**

If the present growth trends in world population, industrialization, pollution, food production, and resource depletion continue unchanged, **the limits to growth on this planet will be reached sometime within the next one hundred years**

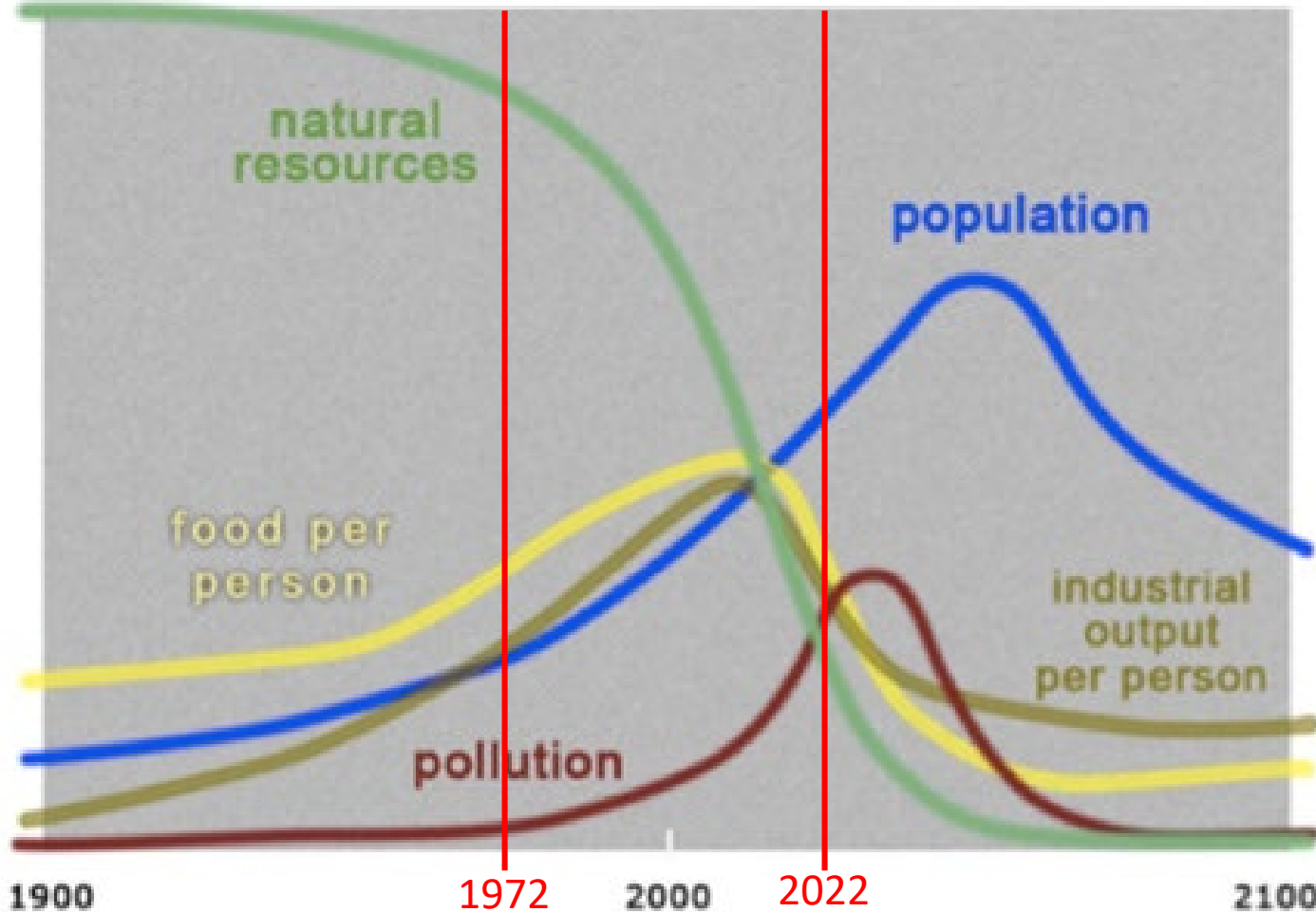
- **Requirements:**

A controlled, orderly transition from growth to global equilibrium



“The Limits to Growth”, 1972

The „business-as-usual“ (BAU) Scenario



Update 2021:

Interestingly - and unfortunately – over the past half century, the world has progressed remarkably close to the “business-as-usual” scenario presented in “The Limits to Growth”

Sources: <https://www.clubofrome.org/cor-themessageofltg/>; Turner, 2014; Herrington, 2021



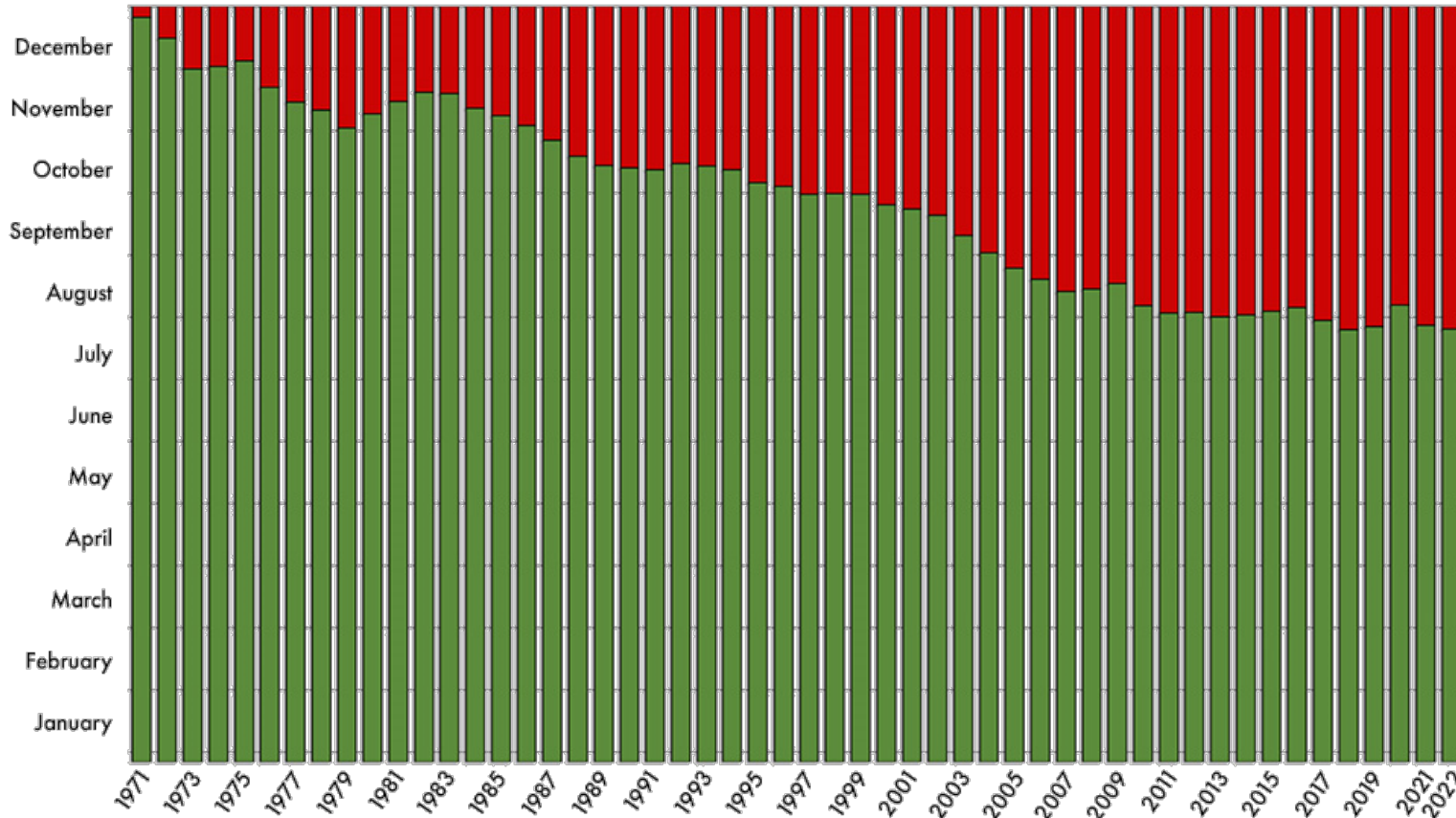
1 Earth

Earth Overshoot Day

1971 - 2022



1.75 Earths



Earth Overshoot Day marks the date when humanity has used all the biological resources that Earth regenerates during the entire year.

This year, Earth Overshoot Day fell on July 28



Source: National Footprint and Biocapacity Accounts 2022 Edition
data.footprintnetwork.org

Source: <https://www.overshootday.org>

Country Overshoot Days 2022

When would Earth Overshoot Day land if the world's population lived like...



For a full list of countries, visit overshootday.org/country-overshoot-days.

*France Overshoot Day updated April 20, 2022 based on nowcasted data. See overshootday.org/france.

Source: National Footprint and Biocapacity Accounts, 2022 Edition
data.footprintnetwork.org



Source: <https://www.overshootday.org>

Definitions:

1. Four key features

(according to ZukunftsInstitut GmbH)

- **Duration**
half-life at least 50 years
- **Ubiquity**
affect all areas of life
- **Globality**
worldwide phenomena
- **Complexity**
multi-layered and multi-dimensional

2. Long-term driving forces that are **observable now** and will most likely have a **global impact**.

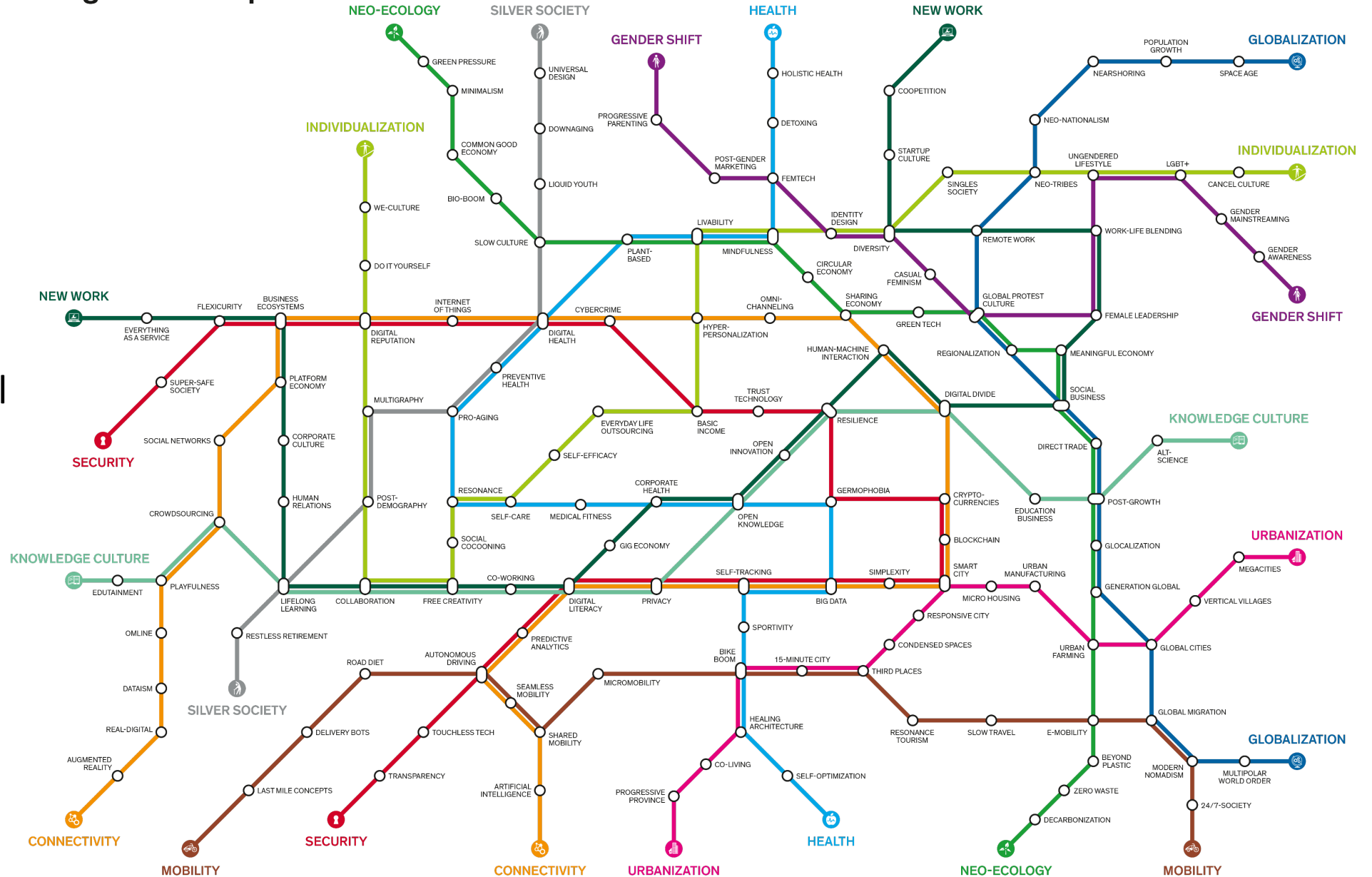
(according to Megatrends Hub by European Commission 2016)

Megatrends (according to ZukunftsInstitut GmbH)

			
Individualization	Gender Shift	Silver Society	Knowledge Culture
			
New Work	Health	Neo-Ecology	Connectivity
			
Globalization	Urbanization	Mobility	Security

Source: <https://www.zukunftsinstitut.de/dossier/megatrends/#12-megatrends>

- long-term
- all areas of life
- global
- multi-layered
- multi-dimensional



SUSTAINABLE DEVELOPMENT GOALS

- The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future
- At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership
- They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests

SUSTAINABLE DEVELOPMENT GOALS

<p>1 NO POVERTY</p> 	<p>2 ZERO HUNGER</p> 	<p>3 GOOD HEALTH AND WELL-BEING</p> 	<p>4 QUALITY EDUCATION</p> 	<p>5 GENDER EQUALITY</p> 	<p>6 CLEAN WATER AND SANITATION</p> 
<p>7 AFFORDABLE AND CLEAN ENERGY</p> 	<p>8 DECENT WORK AND ECONOMIC GROWTH</p> 	<p>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</p> 	<p>10 REDUCED INEQUALITIES</p> 	<p>11 SUSTAINABLE CITIES AND COMMUNITIES</p> 	<p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p> 
<p>13 CLIMATE ACTION</p> 	<p>14 LIFE BELOW WATER</p> 	<p>15 LIFE ON LAND</p> 	<p>16 PEACE, JUSTICE AND STRONG INSTITUTIONS</p> 	<p>17 PARTNERSHIPS FOR THE GOALS</p> 	

View into the near future...



Textile Factory 7.0 –

Rethink the economy – shape the future!

- **Green Factory / Zero Emission (⇒ Textile Factory 5.0)**
 - Energy – Electricity & Heat
 - Exhaust Air
 - Water & Effluents
 - Waste
- **Artificial Intelligence / Robotics / Machine Communication (⇒ Textile Factory 6.0)**
 - Digital Infrastructure & seamless networking in the value chain (man/machine)
 - Data-based business models with "artificial intelligence"
 - Data security and data protection
- **Biotechnology (⇒ Textile Factory 7.0)**
 - Copy of natural life, model is the material cycle of the elements
 - Replacement of conventional industrial processes with biological processes
 - Replacement of non-regenerative raw materials with waste materials / renewable materials

Partnerships

90% of the T7 Factory and 100% of the T7 Park offer companies a place for research, production and collaborations

New Business Models

- Value Creation Partnerships
- Start-Up Funding
- Joint-Ventures
- Technology Platforms
- Block-Chain

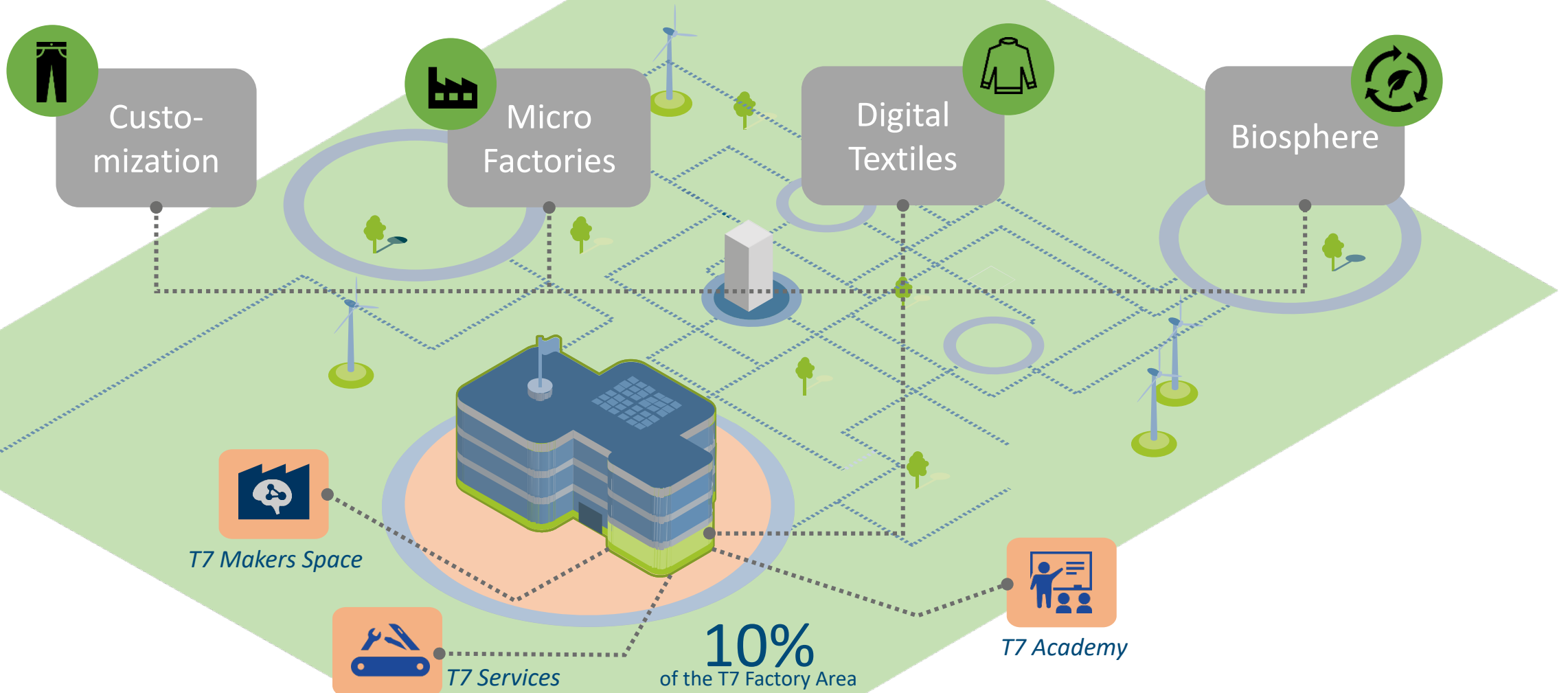
- 90%**
of the T7 Factory for
- Sales Offices
 - Studios
 - Prototyping
 - Application Laboratories
 - Design and Development

- T7 PARK**
- Development Partnerships
 - Production Sites
 - Micro Factories
 - Collaborative Manufacturing
 - Services

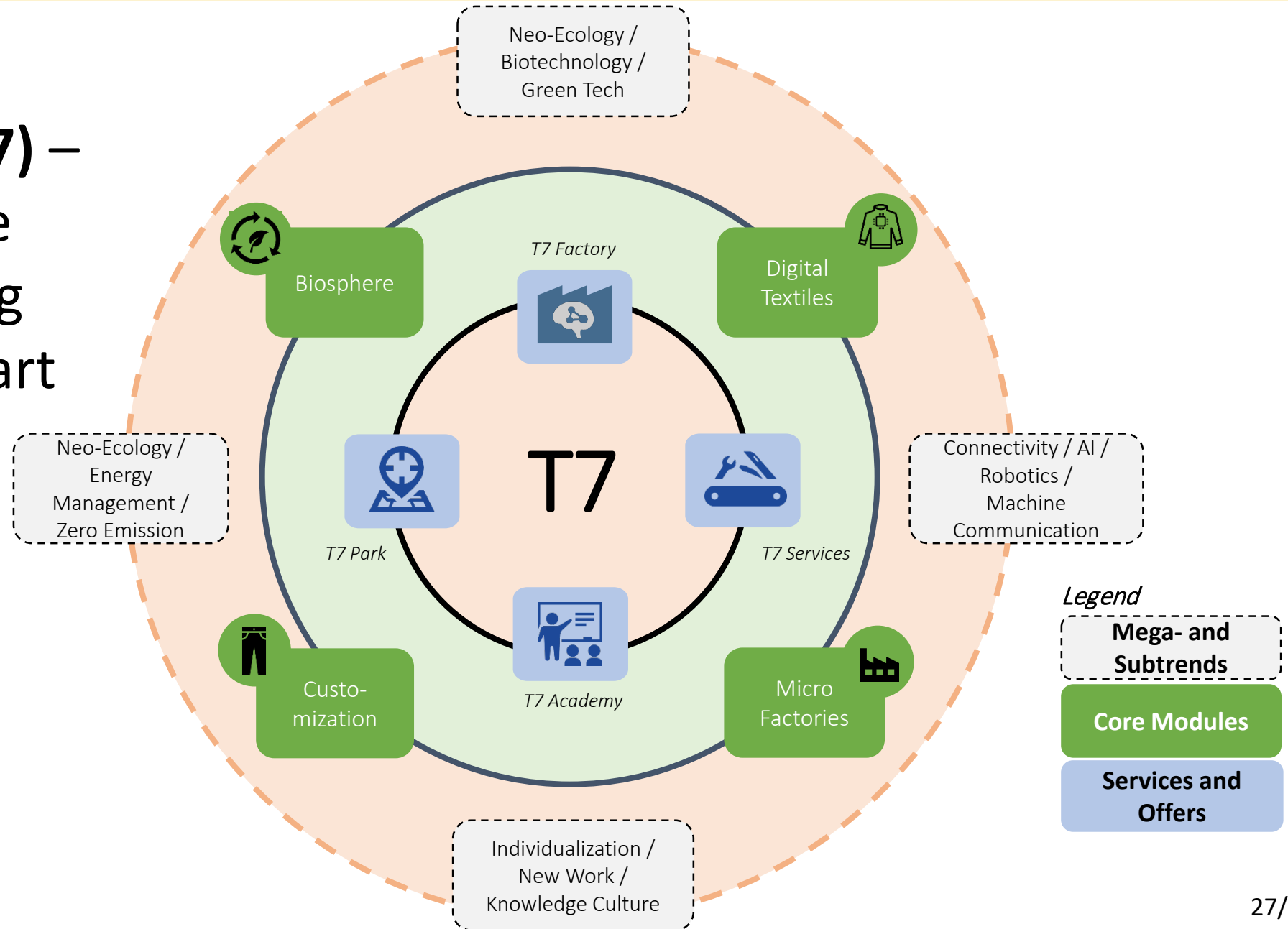


The Textile Factory is the magnet of the new T7 Park

Located in Mönchengladbach, Germany



Textilfabrik 7.0 (T7) – is the future of the textile and clothing industry in the heart of Europe



Four essential modules

Biosphere

- Textile finishing with microbial agents
- Customized product development/analysis and recycling concepts
- Manufacturing of hybrid materials



Digital Textiles

- Feasibility studies
- product design on request, further services
- Full service rental of laboratory- and workshop spaces including professionals



Customization

- Dyeing and finishing services for sample collections in T7, commissioned by customers
- Studio for scalable prototypes “transfer from small to large scale“



Micro Factories

- Machine development on request, proof of concept, consortium and research projects
- Renting of production line for application tests in a “realistic“ production





THINK GLOBAL.
ACT SUSTAINABLE.



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