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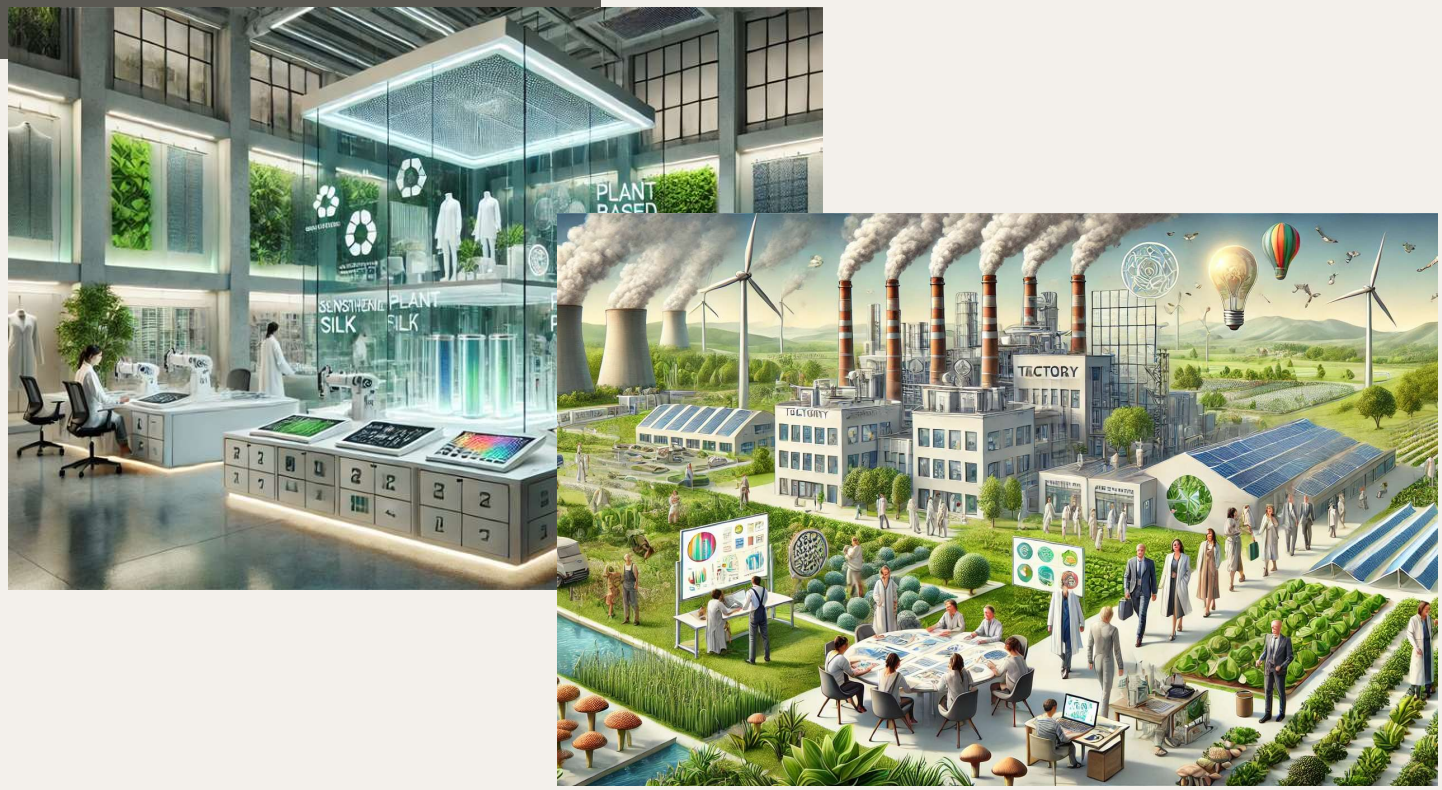

BIOTEXFUTURE
TRANSITION LAB

SCENARIO DEVELOPMENT

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CONTENT

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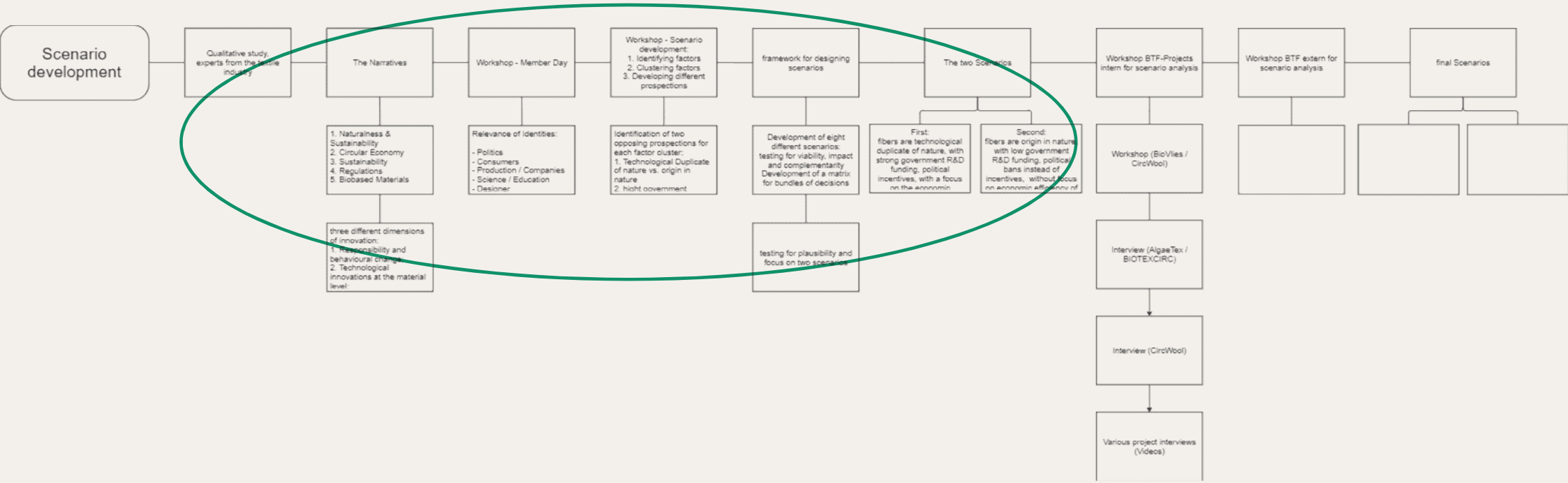
SCENARIO DEVELOPMENT OVERVIEW

FROM QUALITATIVE STUDY TO TWO SCENARIOS



SCENARIO 1

Modular assumptions: Fibers are a technological duplicate of nature, strong government R&D funding, political incentives, with focus on economic efficiency of sustainable products, with D4R

- Driven by technological innovations
- Growing awareness of environmental responsibility
- Biotechnology and sociotechnical innovations are taking centre stage

Companies: transparent supply chains and circular business models

Consumers: Naturalness ≠ organically grown, long-term stability of textiles, use of chemicals

Designer: important role in the transformation, designing modularity for separation + pure fraction recycling of components

Science / education: promoting interdisciplinary approaches to materials development, curricular adaptations

Politics: tax breaks, subsidies for R&D programmes for recyclable material samples with natural properties, fair use of funds

SCENARIO 2

Modular assumptions: Fibers are origin in nature, low government R&D funding, political bans, without focus on economic efficiency of sustainable products, without D4R

- Driven by political bans
- Degradability of textiles
- Infrastructure changes, e. g. waste management
- Trans- and interdisciplinary collaboration

Companies: Creating closed-loop systems through biodegradable products; innovative strategies needed, problem: waste management

Consumers: Naturalness = biodegradable, transparency & support for disposal; high product costs strengthen second-hand market

Designer: “Designs for disassembly” – Modularity of textile for fashion changes,

Science / education: Focus on socio-environmental impacts, innovation slowed by low R&D funding, more collaboration with industry

Politics: Textile biodegradability system, infrastructure development for collection and disposal of used textiles

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KEY RESULTS: SCENARIO DEVELOPMENT

- Political approach
- Incentives vs. bans

Political Incentives / bans

- Government support for research and development
  - e.g. funding programmes, etc.

Low / strong R&D funding

- Role of specific identities, such as designers
- Trans- and interdisciplinary collaboration

Role of specific groups

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“NEXT LEVEL” (CIRCWOOL) GETTING AND BLOCKING ACTION

First Scenario:

Modular Assumptions: Fibers are a technological duplicate of nature, strong government R&D funding, political incentives, with focus on economic efficiency of sustainable products, with D4R

1. **Introduction Round:**
   - What project are you working on?
   - What is the aim of your project?
2. **Scenario Reflection:**

What are the implications for the identities (e.g. politics, consumers, ...) in the dimensions of innovations (e.g. technological innovations, ...) dependent on the modular assumptions for this scenario?

Reflect on the scenario based on the assumptions made prior to the respective project. Use the following structure to discuss the implications including the different identities. Please take detailed notes.

Identities: **Politics – Consumers – Production / Companies – Science / Education – Designer**

dimensions of innovation / modular assumtions	Responsibility and behavioral changes	Technological innovations	System change
Technological duplicate of nature			
Strong government R&D funding			
Political incentives			
Focus on economic efficiency of sustainable products			

Responibility and behavioral changes

- Users as key drivers: knowledge, price, durability
- Exchange between policy, science & industry for targeted incentives and fair funding
- Stronger EU-wide R&D collaboration
- Designers integrated in R&D and D4R processes

Technological innovations

- Fiber innovation: balancing strength and degradability
- Focus on modularity, mono-materials, recyclability
- End-of-life and D4R as part of early-stage research
- Design as interface between research and application

System change

- Users as catalysts for transformation
- Shift from global (Asia) to regional (EU) supply chains
- Demand-driven production and infrastructure development
- Inter- and transdisciplinary research needed for upscaling

Key role: consumers and users, R&D, and research partners such as designers

“FIND YOUR BASE AND GO ON“ (CIRCWOOL) GETTING AND BLOCKING ACTION

Second Scenario:

Modular Assumptions: Fibers are origin in nature, low government R&D funding, political bans, without focus on economic efficiency of sustainable products, without D4R

1. **Introduction Round:**
   - What project are you working on?
   - What is the aim of your project?
2. **Scenario Reflection:**

What are the implications for the identities (e.g. politics, consumers, ...) in the dimensions of innovations (e.g. technological innovations, ...) dependent on the modular assumptions for this scenario?

Reflect on the scenario based on the assumptions made prior to the respective project. Use the following structure to discuss the implications including the different identities. Please take detailed notes.

Identities: **Politics – Consumers – Production / Companies – Science / Education – Designer**

dimensions of innovation / modular assumtions	Responsibility and behavioral changes	Technological innovations	System change
Technological duplicate of nature			
Strong government R&D funding			
Political incentives			
Focus on economic efficiency of sustainable products			

Responsibility and behavioral changes

- Land use plays a key role: primary, secondary & tertiary feedstocks
- Consumers stay within linear habits but commit to circular systems
- Politicians must support bans with viable alternatives & fund basic research
- Lack of R&D funding risks blocking innovation and shared responsibility

Technological innovations

- No strict division between synthetic and natural fibers
- Bans can trigger innovation but require scalable alternatives
- Focus on end-of-life, bio-degradability & recyclability
- Waste stream infrastructure is a prerequisite for scaling & circularity

System change

- Valorization of new waste streams (loop, composting)
- New industries and business models for regenerative products
- Economic efficiency remains crucial — but must be redefined

Key role: R&D, policy (designers and consumers)

TWO SCENARIOS FOR AND IN BIOTEXFUTURE

First Scenario – Project examples

Responsibility and behavioral changes

- In *BioVlies*, farmers' material knowledge (e.g. degradability of agricultural textiles) supports the acceptance and informed use of bio-based fibers
- Incentives for biofiber adoption: subsidies, quality improvements, or price reductions

Technological innovations

- In *CircWool* wool fibres for greater durability are developed - combining and improving natural fibres with biotechnology
- *Gold* uses collagen to improve performance and recyclability of materials
- In *Gold*, designers are involved in translating research into practical D4R product strategies

System change

- *Gold* highlights the need for more research in infrastructure for upscaling innovative fibers — currently concentrated in a few companies

TWO SCENARIOS FOR AND IN BIOTEXFUTURE

Second Scenario – Project examples

Responsibility and behavioral changes

- Consumers' usage habits remain largely unchanged, but they need to participate in return systems – despite the fossil-based infrastructure (based on the BioTexCirc interview)

Technological innovations

- Dichotomy of synthetic and natural fibres is not sustainable in the bio-economy
  - *GOLD* and *FungalFibers* show that biobased origin alone is insufficient – processing innovations are needed to meet performance expectations (biotech necessary)
- *FungalFibers* showed that new bio-based fibers can also replace other less sustainable materials (e.g. chitosan instead of cotton)
- Longevity and recyclability: in *BioTurf*, end-of-life and LCA analysis show that using sugar beet as a mono-material base can perform worse than fossil-based alternatives such as crude oil

System change

- In *CircWool* the development of new wool fibres also means recycling their waste products
- In *AlgaeTex*, cultivation options must be reassessed and weighed against conventional fiber sources – reviving the "food vs. fuel" debate

KEY RESULTS OF THE WORKSHOP / INTERVIEWS – BTF INTERN

- Technological duplicate of nature and origin in nature
- Role of biotech

Drivers of Transformation

- Political approach
- Depending on the government support
- Fundamental research

Political Incentives / bans
Low / strong R&D funding

- Trans- and interdisciplinary collaboration
- Collaboration between R&D projects and politics

Collaboration

- user vs. consumer,
- researcher and identities in research projects, such as designers,
- politics

Key roles

Limitations: different qualitive settings (Workshop, Interviews, BTF Interviews) with different questions, few project leads are not available

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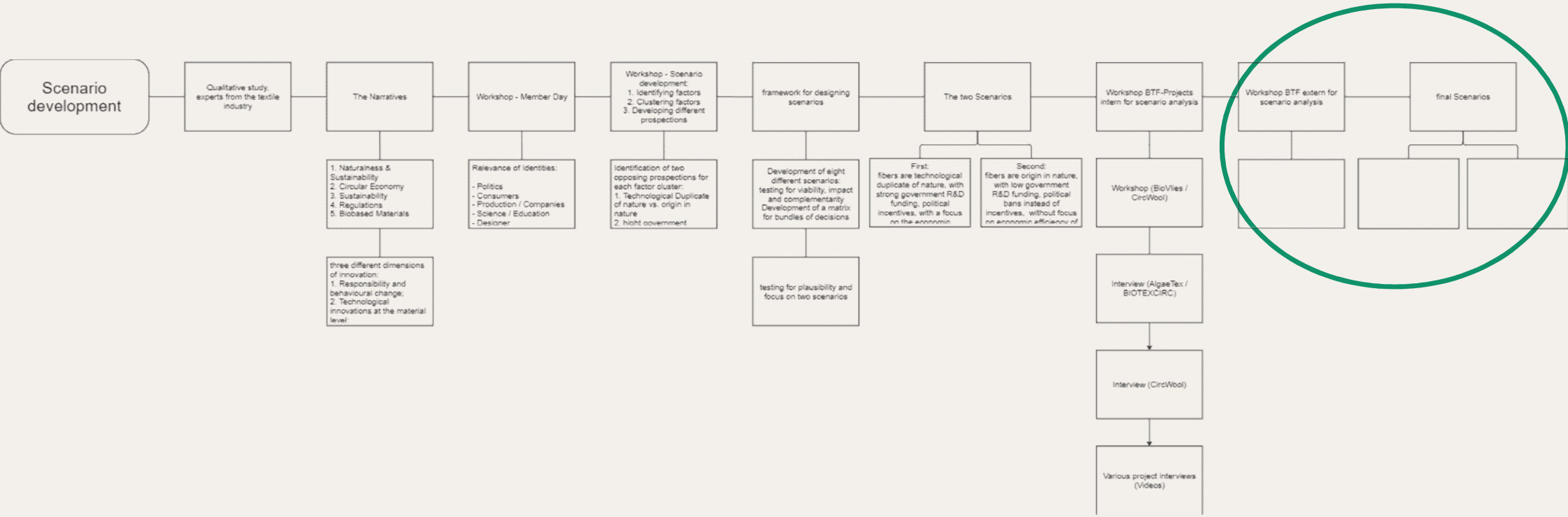
NEXT STEPS AND FINAL SCENARIOS



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Thank you for your attention!

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