



IPIC 2021



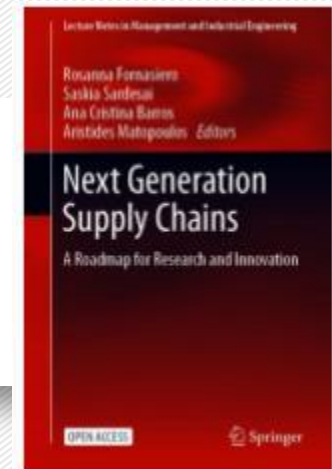
# Biointelligent Supply Chain

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Next Generation Supply Chains: A Roadmap for Research and Innovation

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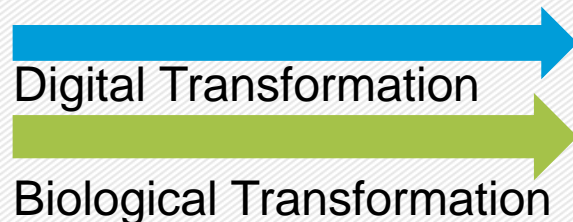
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Horizon 2020  
European Union funding  
for Research & Innovation

# Extract of trends towards biointelligence

- Different companies, especially start-ups, experiment with **bio-based production**
- Rise of do-it-yourself entities and small, innovative start ups enforce the **concept of prosumer** – each consumer acts as a provider of resources
- European Commission plans to reduce the GHG emissions by 40% in 2030<sup>1</sup>
- New concepts with AI technologies enable **decentral and autonomous** planning.
- New strategies to couple simulation and AI enable an **ad-hoc re-planning** of supply chain structures based on scenario management

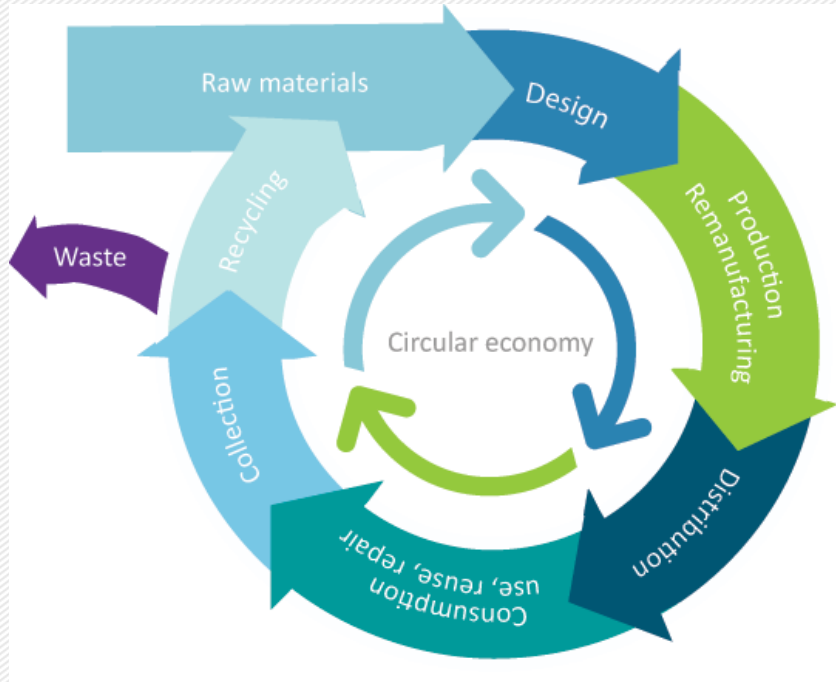


## Requirement

A re-design and re-planning of supply chains is needed that respects an ad-hoc re-allocation of resources within a multi-partner network and ensures ecological neutrality.

# Circular Economy and Hyperconnected Supply Chains are a requirement to enable a Biointelligent Supply Chain.

## Ressource Efficient / Circular Economy



The concept of circular economy neglects essential aspects of manufacturing and industry.

## Hyperconnected SC



Digitisation as an enabler, but not as a process for sustainable economy.



- Parallel developments of circular economy practices and digital transformation.
- Concepts to mirror nature to derive further systemic solutions and technical systems to manage production and logistics.
- Ecological goal: implementation of green concepts enabling emission neutral SC processes.
- Efficiency goal: imitating concepts from nature for decentralised settings and self-configurations of the SCs.

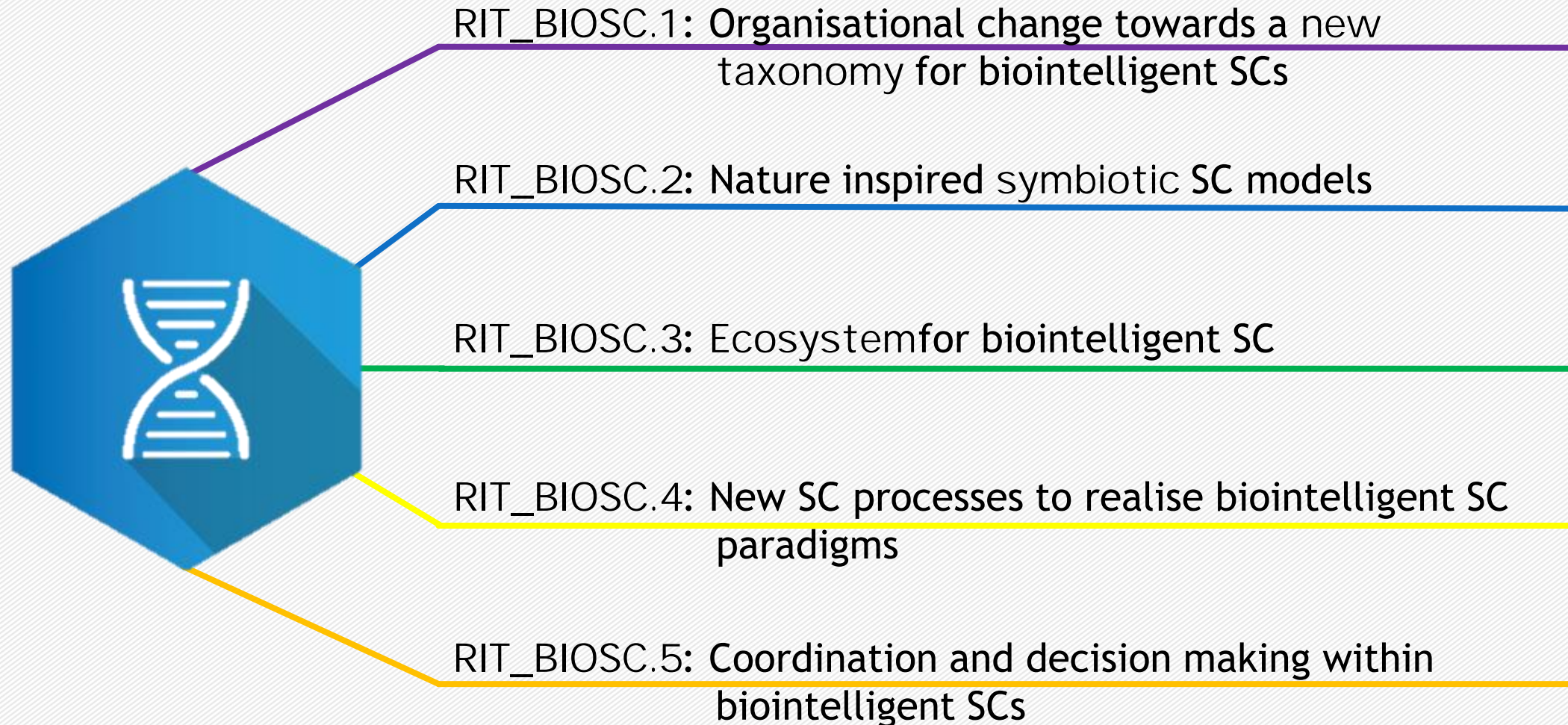


# Challenges



- *Efficient reuse of resources*  
New concepts need to be developed.
- *Resource Management*  
The underlying concept of circular economy requires a 100% resource efficiency
- *Collaboration in a decentralised environment*  
A biointelligent integrates highly interconnected decentralised units. This includes new actors like prosumer and companies for disaggregation or amendment of products.
- *Flexible, highly agile SC*  
Request for production-on-demand requires a highly flexible and agile SC.
- *Technological Integration for seamless connections*  
Real-time communication, interoperability between devices and IoT systems, communication between autonomous devices require a respective technological architecture.

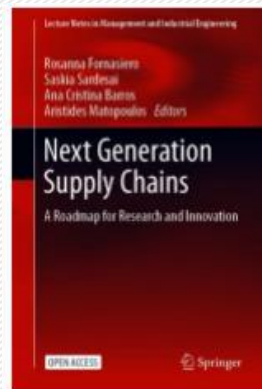
# Research and innovation topics for Biointelligent Supply Chain





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