

# CIRCULAR SYSTEM BIOMASS



# Biomass, Birkenfeld – Circular System Characteristics

## System characteristics:

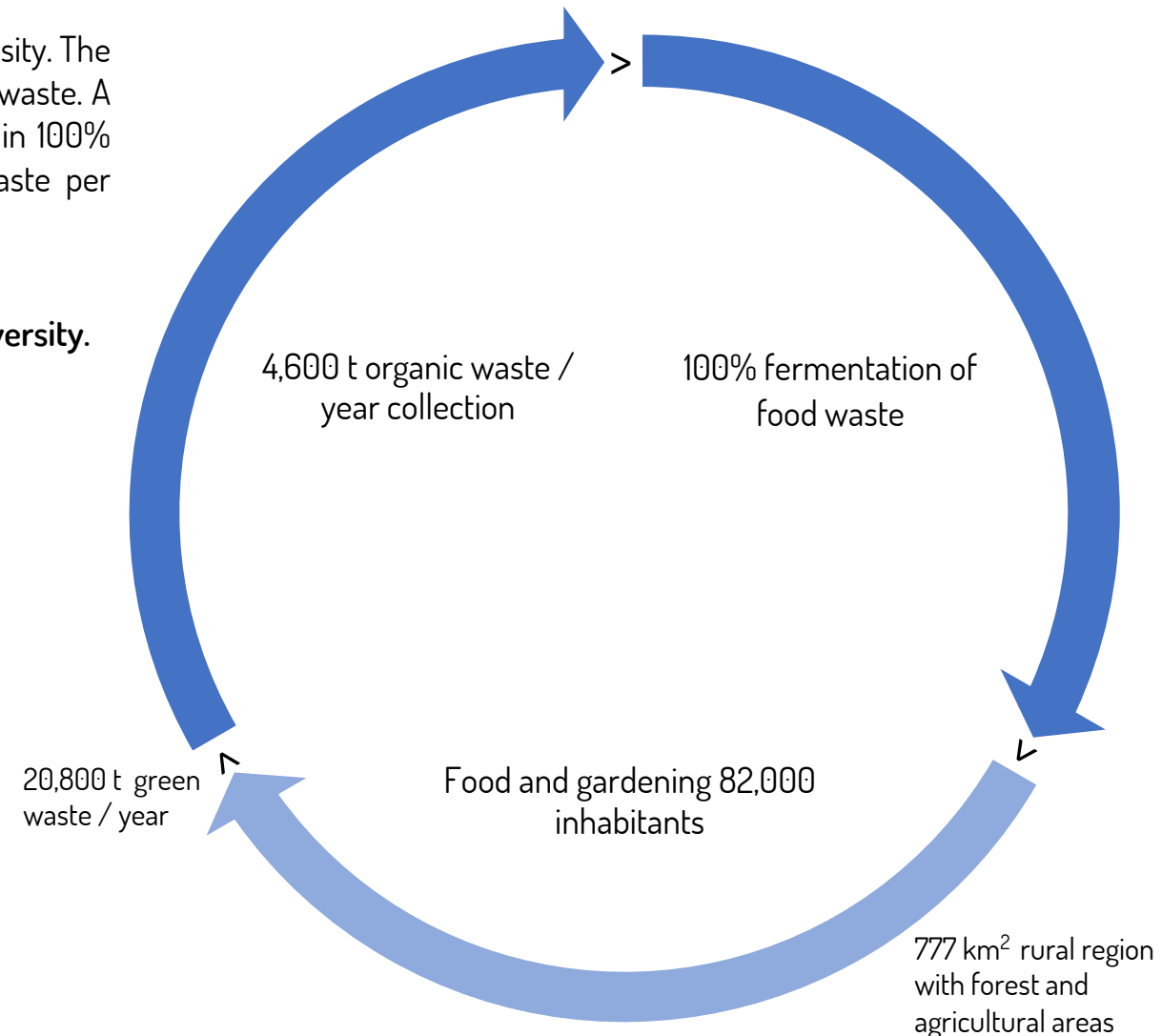
The German region “Nationalparklandkreis Birkenfeld” is a rural area with low population density. The biomass cycle is based on a municipal collection system with 73 collection points for green waste. A mandatory waste-bin for food waste is widely accepted (100% use rate). Biomass is used in 100% bio-gasification for local heat. Around 80 kg of organic waste and 200 kg of green waste per inhabitant and year is managed in a cycle.

## Availability/Role of recycling technology:

- **Fermentation plant and system implementation had scientific support by a local university.**
- **Master plan for use of biomass exists.**

## Maturity of market:

- Monopolistic situation: One contractor for bio digestion of food waste.
- **Private Public Partnership, highly regulated, public transparent.**
- Free distribution of compost for the region.
- Savings on fees for residents, yearly adjustments on results.
- Savings by the reduced buy in of chemical fertilizers, which shrank to zero in monitored projects].





# SWOT Biomass

1. Closed loop
2. Biological cycle, C2C
3. Public Private Partnership, CE Compliance
4. Scientific monitoring
5. High regional acceptance
6. Transparency by public control

## Strength

1. System is limited by administrative borders and legislation
2. No comparability to urban municipalities

## Weakness

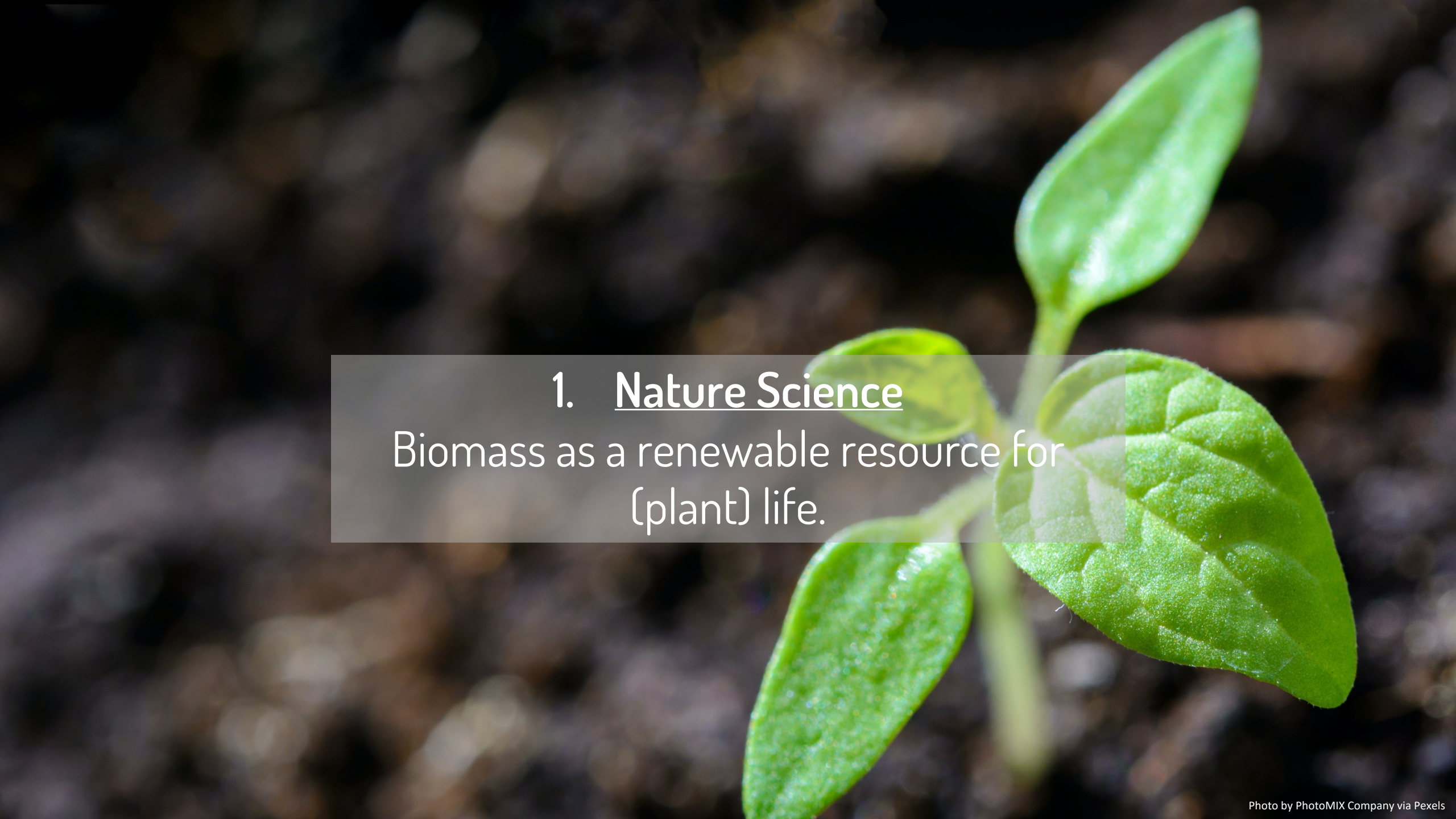
## Opportunity

1. Potential saving on fees for residents
2. Complete close the loop system

## Threat

1. Contamination by incorrect sorting





# 1. Nature Science

Biomass as a renewable resource for  
(plant) life.





## 2. Envisioning

Make biomass useable as fertile soil to better raise crop and to manage waste and smell.





### 3. Investment

Collection of biomass helped solving waste problems in early urbanization.





## 4. Rocket Science

Development of compost works.

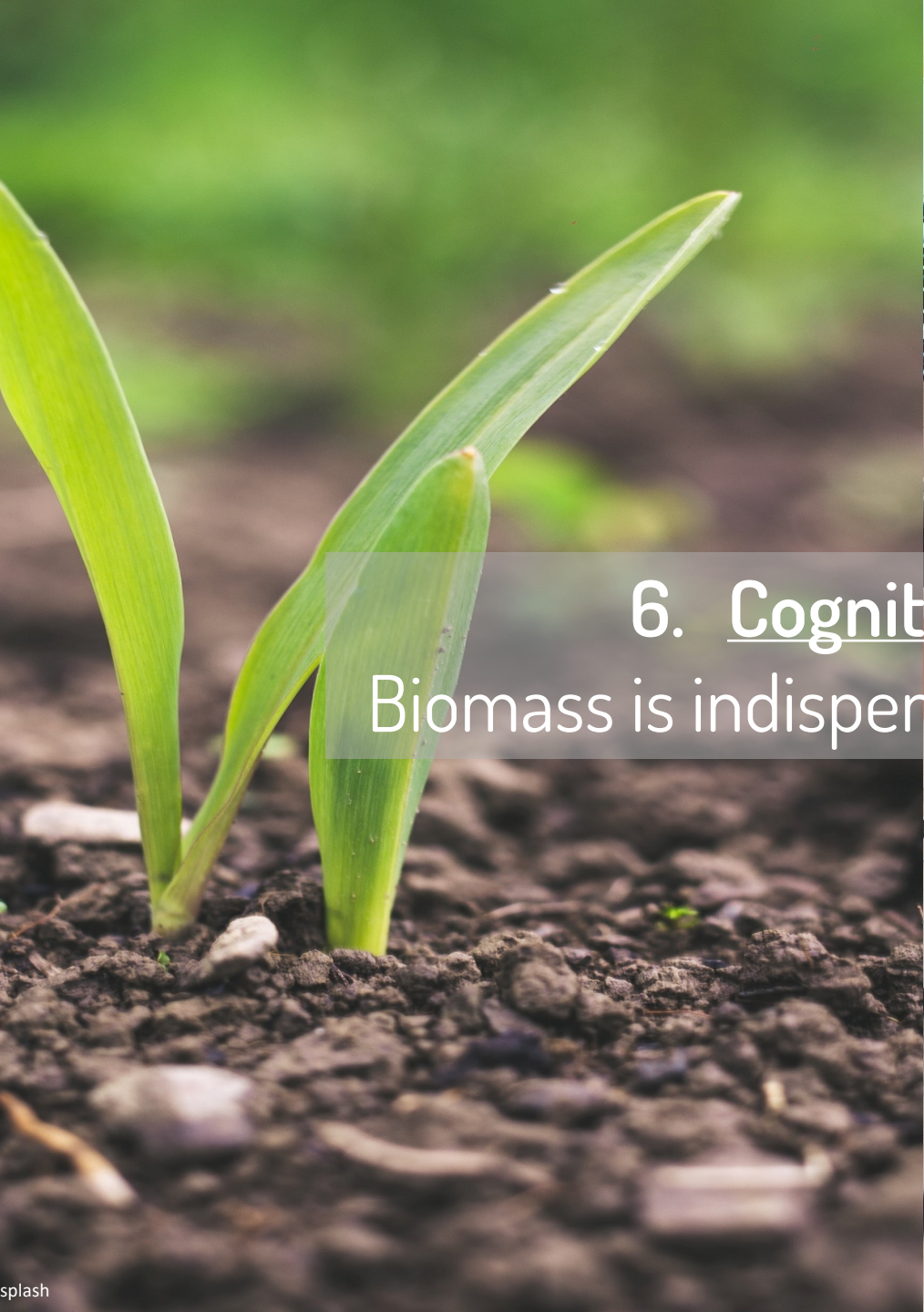




## 5. Historic Event

Global food crisis during the 1970s leads to higher fertilizer demand. Oil crisis in the early 1980s leads to historically high energy prices and demands the development of renewable energy solutions. Biomass recycling as an answer to three pain points at that time: fertilizer, energy and protection against erosion.





## 6. Cognition for System Relevance

Biomass is indispensable for soils and energy recovery.







## 7. Technical Innovation

Using biomass not only as compost but also as renewable energy source.





Umwelt-Campus  
Birkenfeld

H O C H  
S C H U L E  
T R I E R

## 8. Business Innovation

Only very few market players have succeeded in managing the system.



Nationalpark  
Hunsrück-Hochwald





## Kostenlose **Abfall-App** herunterladen!

- Abfuhrkalender mit Push- und Erinnerungsfunktion
- Übersicht der Wertstoffhöfe
- Illegale Ablagerungen melden
- Sperrabfall zur Abfuhr anmelden
- Gefäßänderungen
- und mehr



– Hier klicken für weitere Informationen –

## 9. Life Cycle

System has evolved. Technical cycle is working. Biomass gets fully recycled.



Photo by Abfallbetriebe des Nationalparklandkreises Birkenfeld

Ihr persönlicher  
**Abfallkalender**



Photo by Verbandsgemeinde Birkenfeld



Photo by Abfallbetriebe des Nationalparklandkreises Birkenfeld



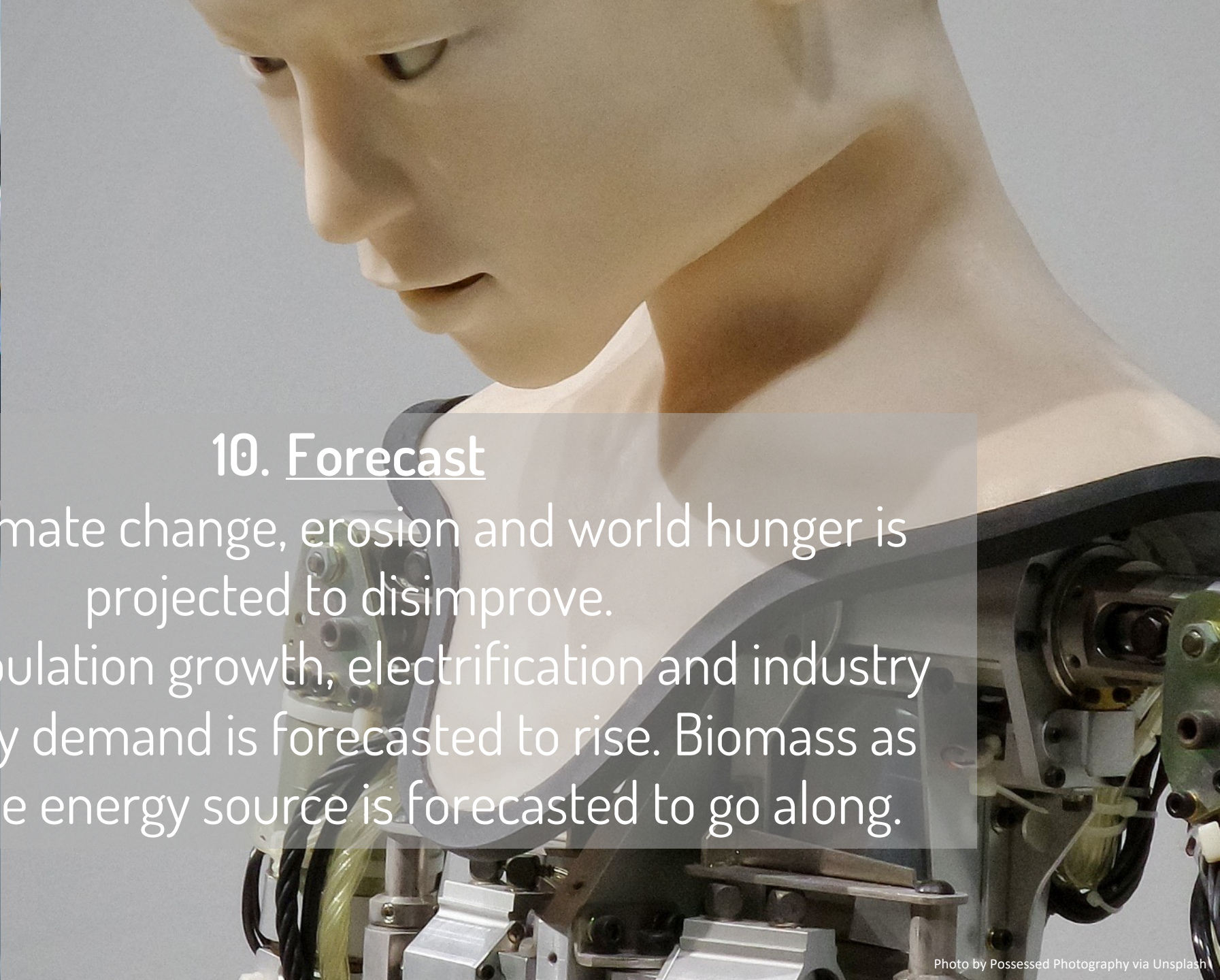
Photo by Abfallbetriebe des Nationalparklandkreises Birkenfeld



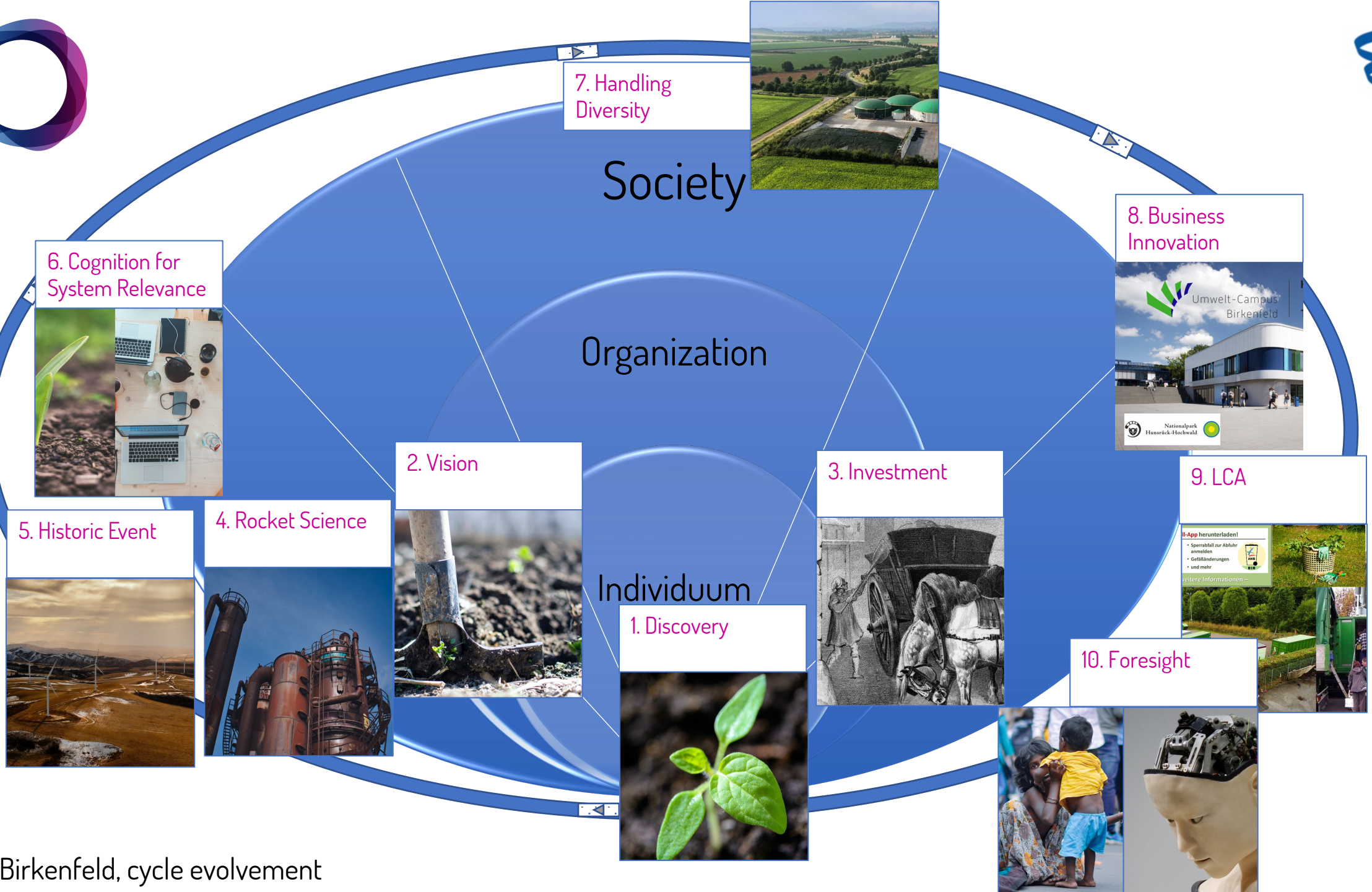


## 10. Forecast

Due to climate change, erosion and world hunger is projected to disimprove.  
Due to population growth, electrification and industry 4.0, energy demand is forecasted to rise. Biomass as renewable energy source is forecasted to go along.



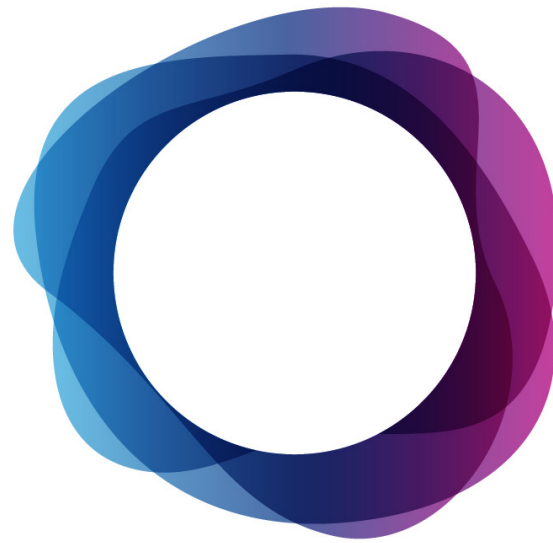






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