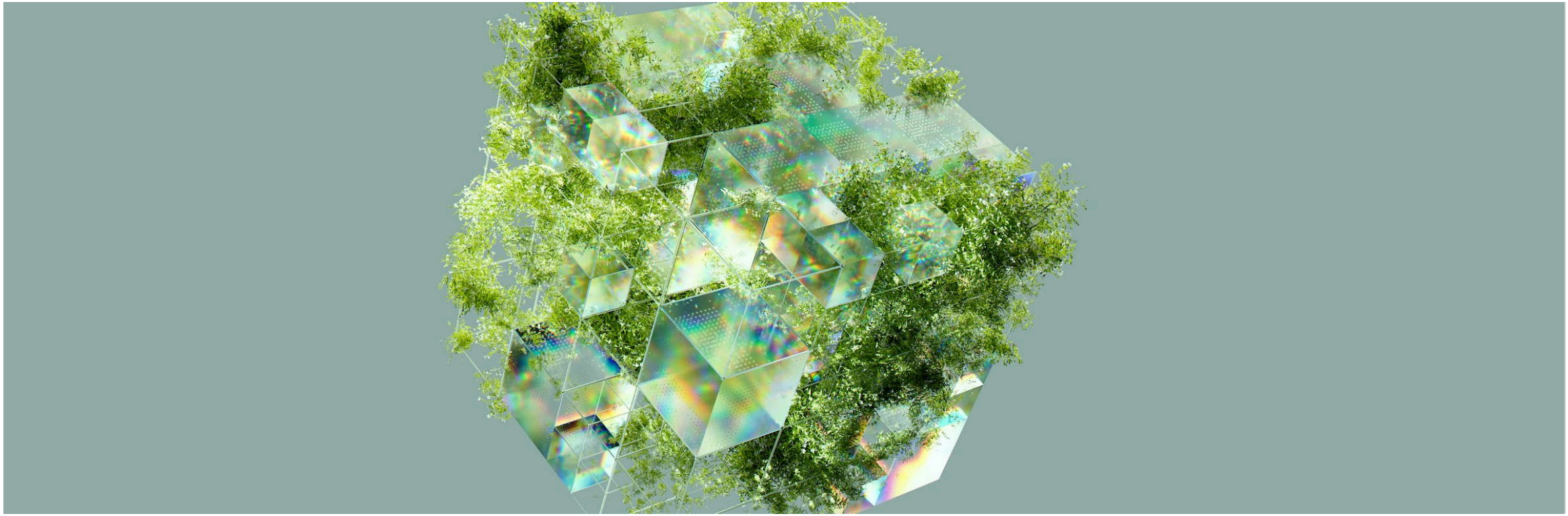
Hochschule Bielefeld
University of Applied Sciences and Arts

BiCAB
Bielefeld International Conference on Applied Business



Bielefeld International Conference on Applied Business (BiCAB)

“Sustainability innovations in times of crisis”

12 May 2023

HS'BI Hochschule Bielefeld University of Applied Sciences and Arts

BiCAB Bielefeld International Conference on Applied Business

WELCOME SPEECH

Prof. Dr. Riza Öztürk (Dean, Bielefeld School of Business, HSBI)

Prof. Dr. Rolf Naumann (Dean, Faculty of Engineering and Mathematics, HSBI)

Hochschule Bielefeld
University of Applied Sciences and Arts

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ACT2SUSTAIN – HSBI'S SUSTAINABILITY PROGRAMME

Prof. Dr. Natalie Bartholomäus, Vice President Sustainability, People & Culture, HSBI

9:30-9:40 Uhr

Hochschule Bielefeld
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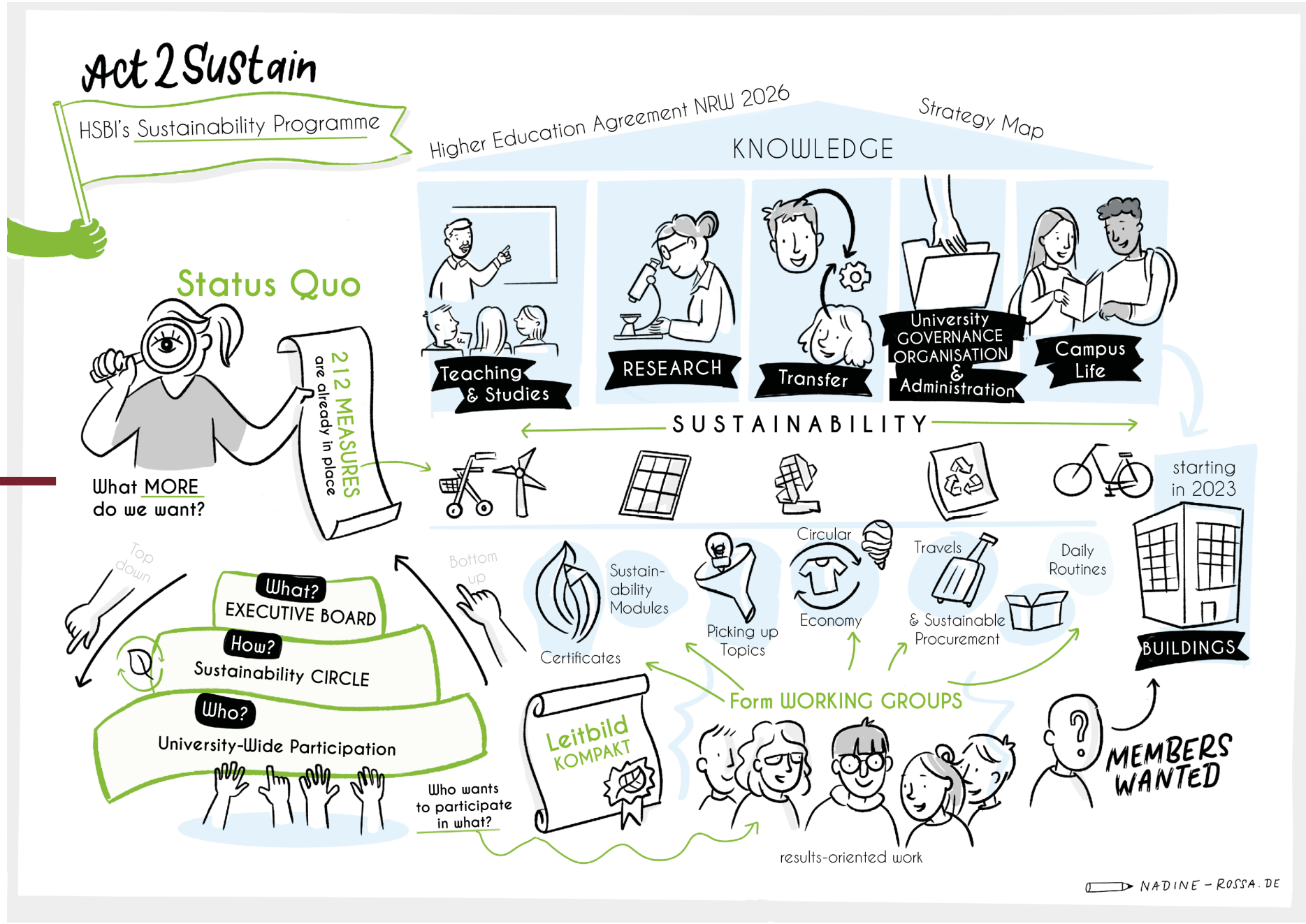
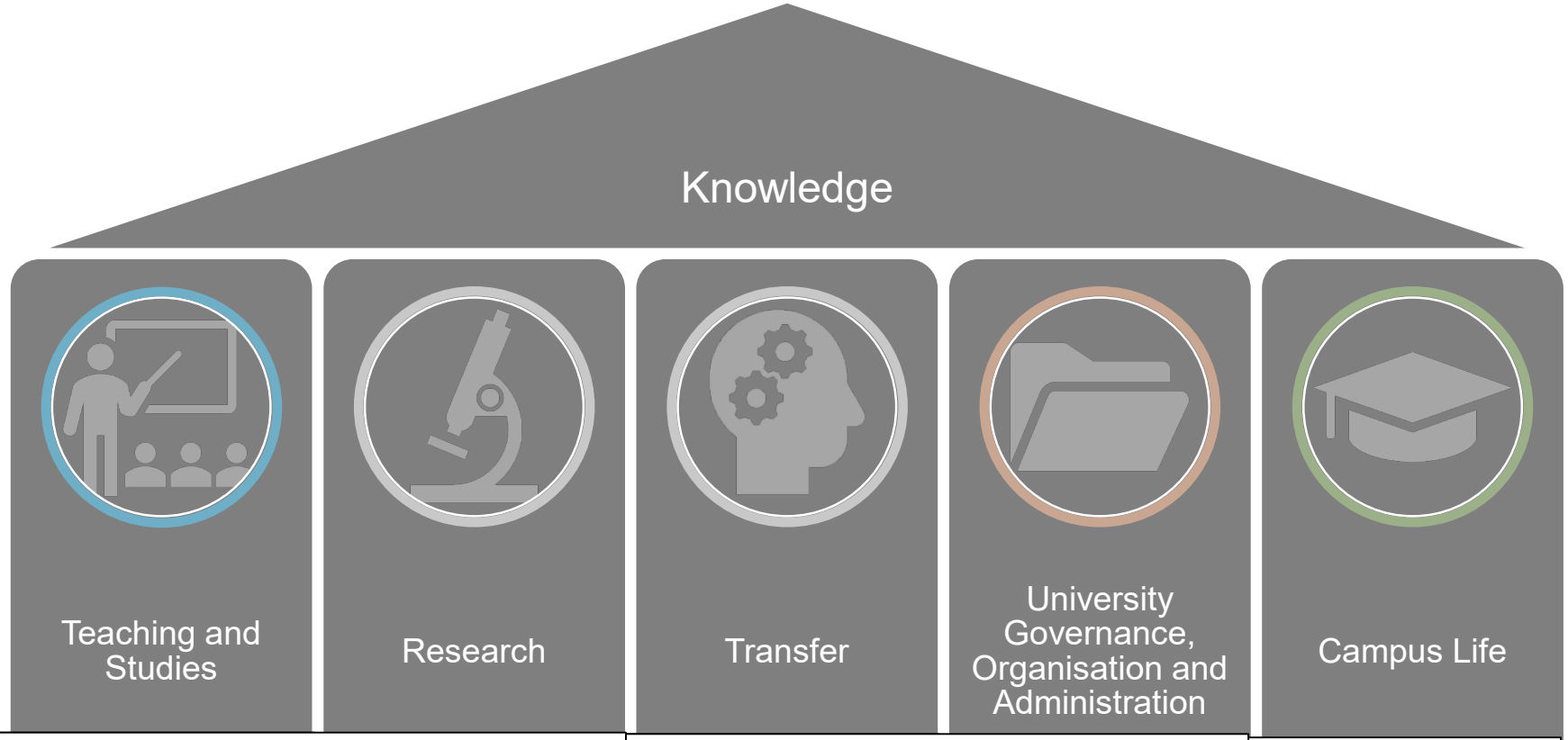
Act2Sustain – HSBI's sustainability programme



Graphic recording of
"Act2Sustain – HSBI's Sustainability Programme"
Introduction at HSBI's sustainability information event
on 21 October 2022

Status Quo
– Cross-section and highlights



Teac

- **FB2:** Civ.Eng.: sustain
  sectionally (sustainabi
  and planning of buildi
- **FB3:** Renewable Ene
- **FB4:** Social Work stu
  Studies MA study prog

Research

- **FB2:** Research activities in the fields of photovoltaics and CO_2 reduction
- **FB3:** Institute for Technical Energy Systems (ITES), CirconomyOWL – a production site closes circuits (ERDF)
- **FB4:** Profile development of CareTech OWL (TransCareTech), evaluation of a communication campaign to reduce food waste in Mexico with WWF Mexico

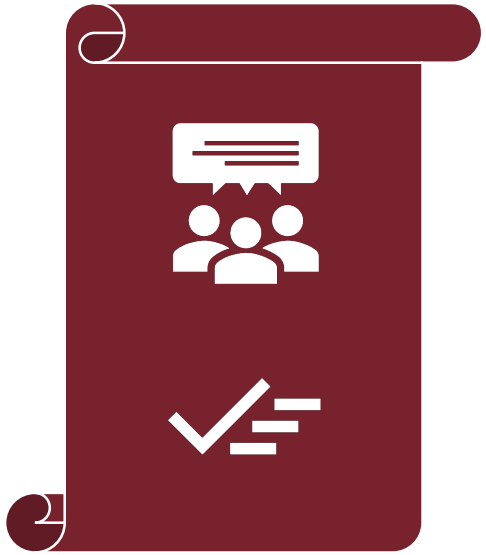
nistration and Organisation

- of online evaluation (reduced paper
- % of the purchased copy papers are recycled
- S Green Mobility fund, International Office Green
  rasmus without paper, digital mobility

nmitment
origin in 2021 already
rasmus without paper,

Sustainability Circle
– Leitbild_kompakt

What sustainability means for HSBI



In the Sustainability Circle's second meeting, the strategy-related concepts were determined:

As a result, the SC's members were able to find common ground for the aspects

- **Gain** (What do we want to achieve?)
- **Purpose** (Why do we pursue sustainability?)
- **Mindset** (What is our common mental model of sustainability?)

which were formulated to a compact mission statement, **Leitbild_kompakt**, in cooperation with the Communications Office and received the programme name **Act2Sustain**.

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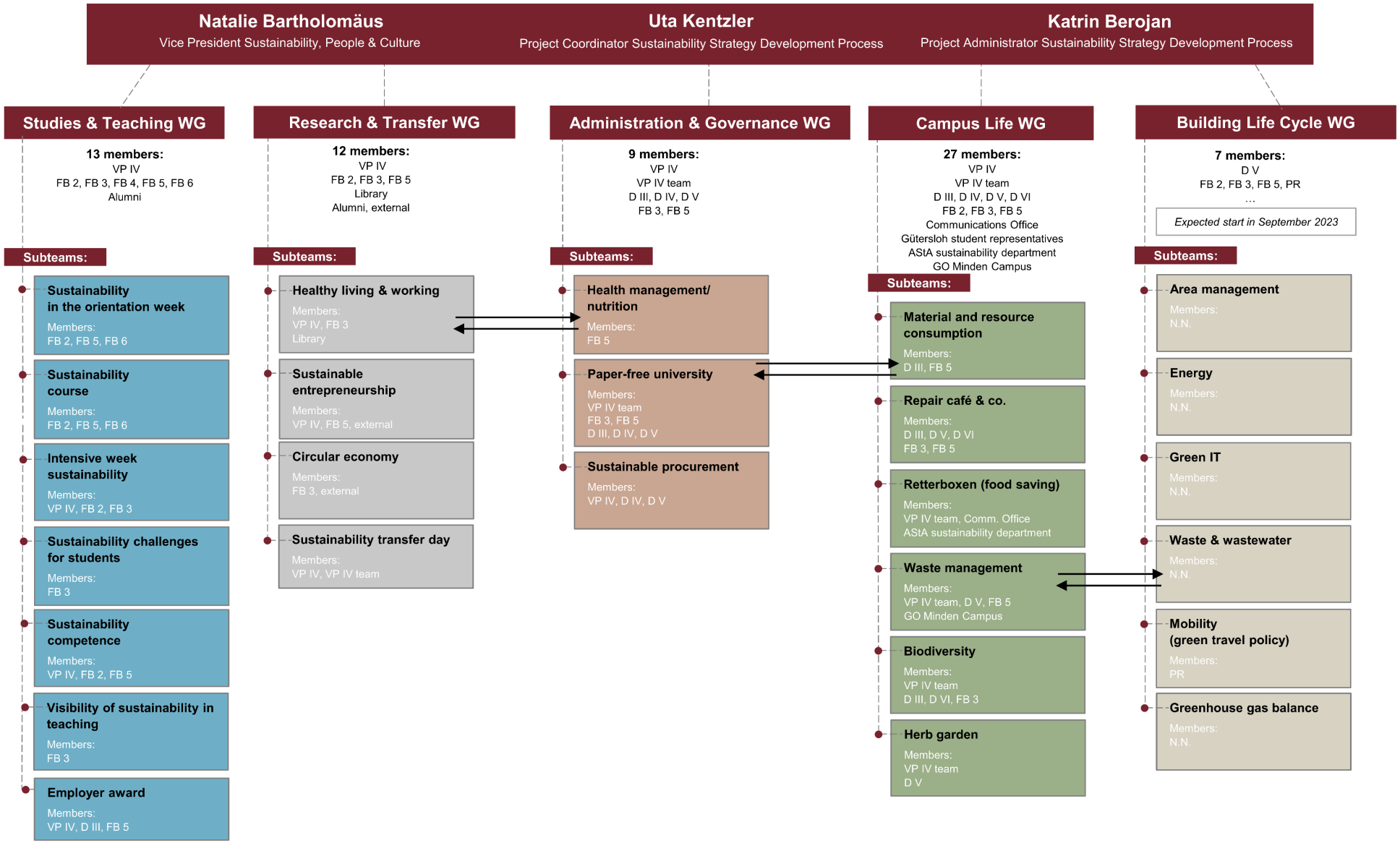

Act2Sustain – Organisational chart of HSBI's sustainability programme

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KEYNOTE SPEECH – **„A BRUTAL DESASTER AND A SIMPLE SOLUTION - WHEN ENVIRONMENT MEETS ECONOMY!“**

Dr. Thomas Henningsen, Marine Biologist, Greenpeace Campaigner, ORCA Founding Shareholder

9:40-10:40 Uhr

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KEYNOTE SPEECH – „SUSTAINABILITY STRATEGY AT HALFAR

Marco Lemkemeyer, Halfar System GmbH

10:40-11:10 Uhr

HALFAR®

Der Taschenexperte aus Bielefeld

Sustainability in Strategy & Practice

HALFAR
Starke Taschen.

AGENDA

COMPANY AND **FIELDS OF CORE BUSINESS**

SUSTAINABLE COMPANY HISTORY (EXTRACT)

THE COMPANY _ **SUSTAINABLE STRATEGY**

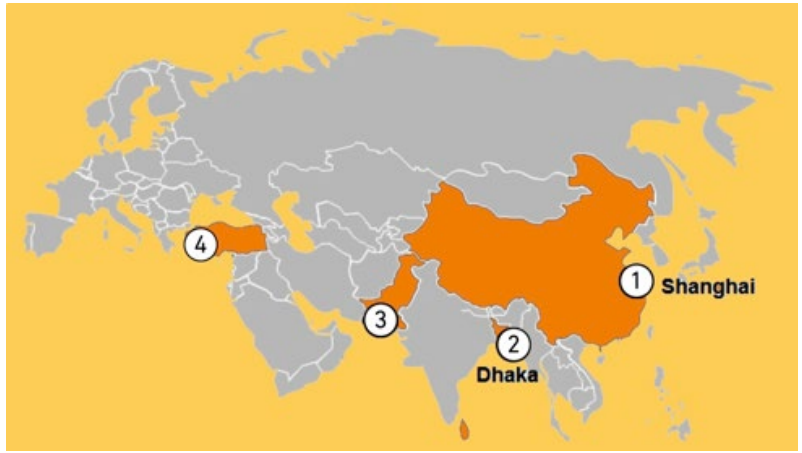
SUSTAINABLE STRATEGY

WAY TO **IMPLEMENT IN** A **COMMUNICATION**

HOW TO **MOVE FROM STRATEGY TO ACTION**

BEST PRACTICE EXAMPLES HALFAR

THE COMPANY_ HOLDING



Halfar System GmbH is a subsidiary of JCK Holding

- Die JCK Holding ist die Dachorganisation einer vielfältigen und leistungsstarken Unternehmensgruppe, die heute weltweit agiert.
- JCK Holding is the umbrella organisation of a diverse and powerful group of companies that today operates worldwide.
- Das **Werbemittelsegment** mit insgesamt 6 Schwesterfirmen bildet die CHOICE-Gruppe: Halfar, FARE, Daiber, Karlowsky, SND, mbw
- The advertising segment with a total of 6 sister companies forms the CHOICE Group: Halfar, FARE, Daiber, Karlowsky, SND, mbw
- Die Internationale Beschaffung und Qualitätssicherung erfolgt in: Shanghai, Dhaka, Karachi, Istanbul
- International procurement and quality assurance takes place in: Shanghai, Dhaka, Karachi, Istanbul

THE COMPANY _HALFAR SYSTEM GMBH

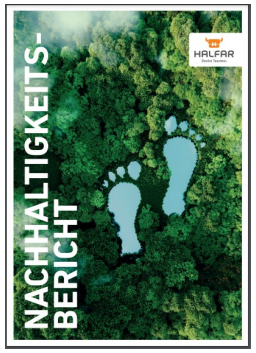
- 129 employees (as of 12/2022)
- 15 trainees in 7 apprenticed professions
- Bag manufacturer for over 30 years
- 2 business segments (promotional bags & technical bags)

- Since 2000 in Bielefeld's Ludwig-Erhard-Allee industrial estate
- Eigenes Logistikzentrum nahe des Hauptstandortes

THE COMPANY_ BUSINESS SEGMENTS

HALFAR

TECHNICAL BAGS

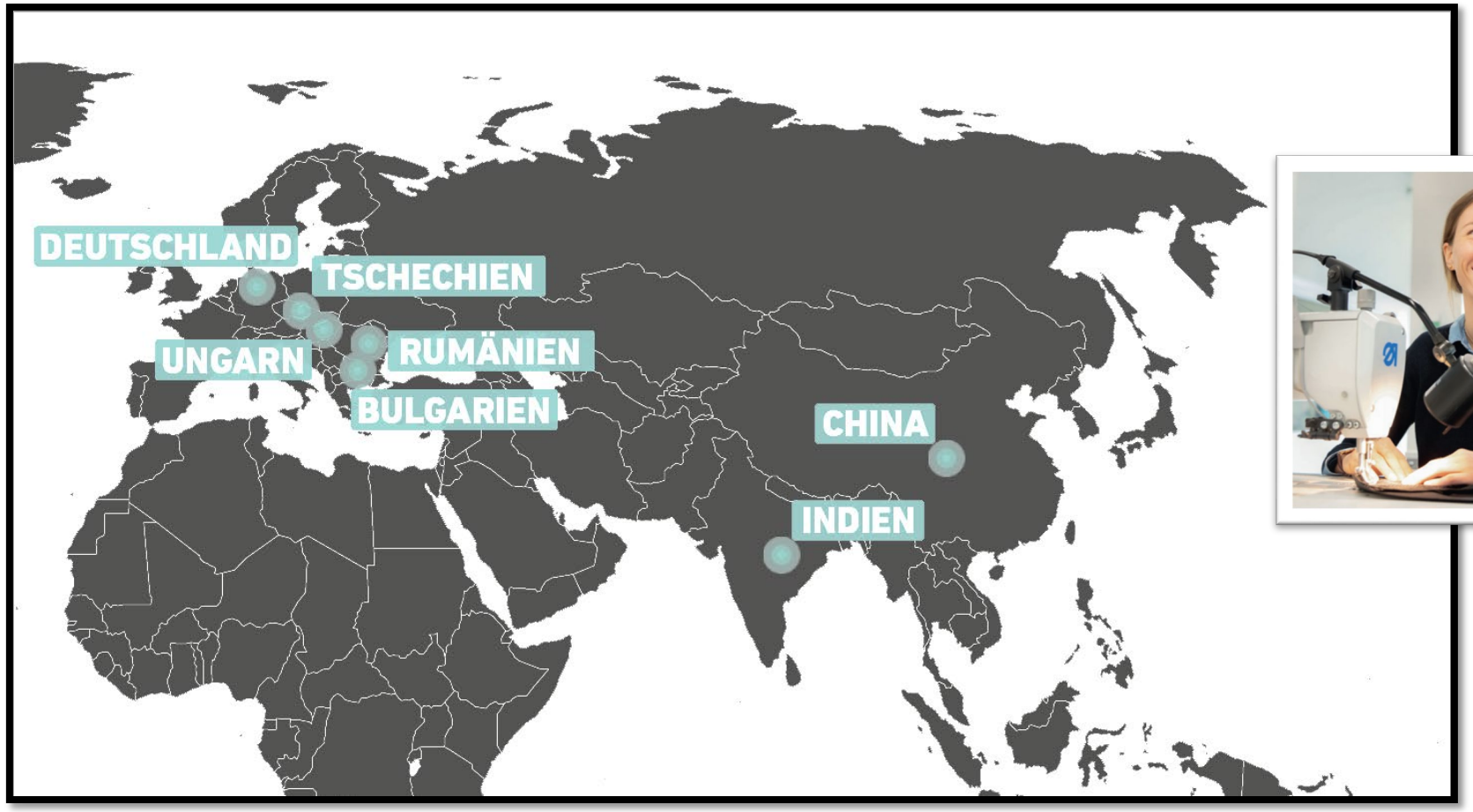


PROMOTIONAL BAGS

Internal departments: Sales (domestic and international), purchasing, logistics, pattern making, embroidery, graphics, marketing, etc.

Vocational Job: industrial clerk (m/f/d), wholesale and foreign trade clerk (m/f/d), warehouse logistics specialist (m/f/d), digital and print media designer (m/f/d), Textile and fashion seamstress (m/f/d), e-commerce clerk (m/f/d)

THE COMPANY_ PRODUCTION SITES



THE COMPANY _ HISTORY

1986

2000 1. own building

2001 1. **Photovoltaik** system

2006 extension with wood **pellet heating**

2009 BSCI member ship

2013 Extension with wood pellet heating, **heat pump**, green roof, use of automatic **LED lighting system**

2015 ÖKOPROFIT
JOB BIKES

2017 **100% climate-neutral work** at the company headquarters
introduction of organic cotton according to **GOTS** in the stock range / Introduction of voluntary sustainability reporting

2018 first certification to DIN ISO 14001:2015
introduction of **fairtrade** in the stock range / Integration of the **SDGs** into the sustainability report

2019 New Work space/ water dispenser/ E-charging station/
1.EcoVadis certification /

2020 Flat roof greening on construction phase 1 in cooperation with
Insect Respect®

2021 Introduction of products with **recycling material** / Introduction of an
environmental policy / Introduction of a sustainable procurement policy

2022 Certification according to the **Global Recycled Standard** (GRS) / Calculation of first **CCF & PCF** with compensation

2023

FUTURE

HALFAR

THE COMPANY _ MINDSET

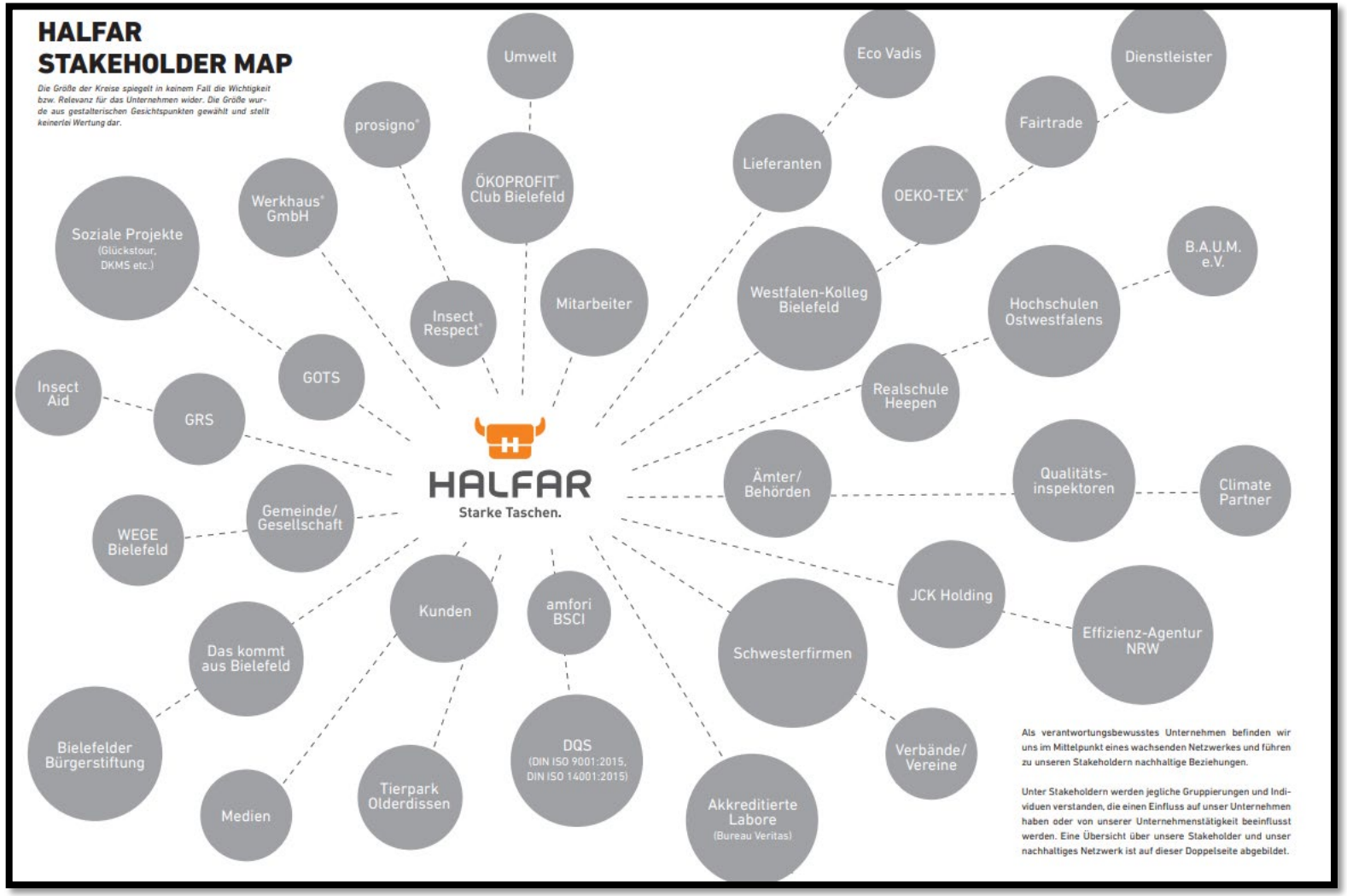
*"....this means that the **fundamental effort towards sustainability** must come **from the WILL of the company/entrepreneur.** In the next step, one must be ABLE to do it and the market must PERMIT it. Legal requirements can enforce some things and flank many things, but in the end they cannot penetrate."*

Kathrin Stühmeyer-Halfar

THE COMPANY _ SUSTAINABLE STRATEGY

- **Products:** relevant and of high quality. Promotion of innovation. Integration of sustainable technologies, materials or services that can lead to positive change and be economically successful in the long term.
- Establishment and maintenance of an **infrastructure** (buildings, machinery, etc.) that is economically viable and meets the highest possible environmentally compatible and climate-friendly standards
- Employees, customers, suppliers and all **stakeholders** should **share the values of the company** as much as possible and be treated fairly and respectfully with their respective interests.
- Promote a sustainable mindset and behaviors at all levels of the company to ensure that sustainability is and remains an integral part of the **corporate culture**

THE COMPANY_ STAKEHOLDER AND INFLUENCING FACTORS

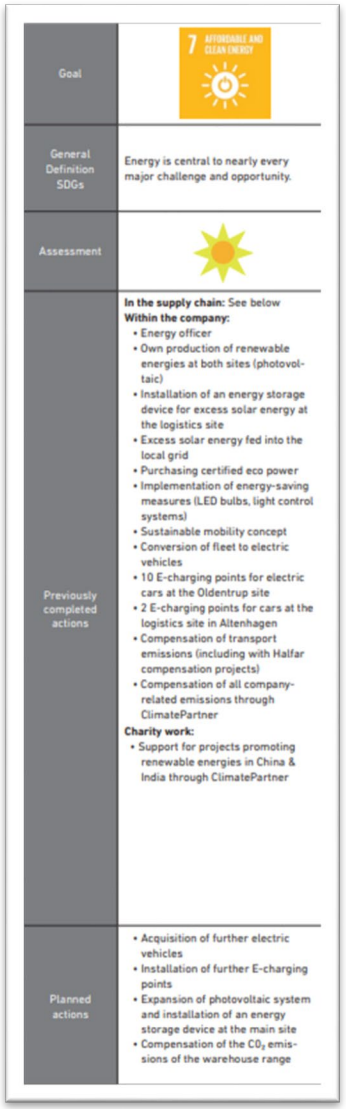


Different requirements and circumstances may influence, delay or require changes in the implementation of sustainability measures. e.g. :

- different standards
- different legal regulations
- requirements on the material
- industry and sector requirements
- personal preferences
- limited influence in the supply chain
- etc.

THE COMPANY _ SUSTAINABLE STRATEGY_TRANSPARENCY

Ökonomisch = Produkt	Ökologisch = Natur	Sozial = Mensch	
Wirkungsbereich Markt	Wirkungsbereich Umwelt	Wirkungsbereich Gemeinwesen	Wirkungsbereich Arbeitsplatz



Energy is central to nearly every major challenge and opportunity.

In the supply chain:
- See below

Within the company:

- Energy officer
- Own production of renewable energies at both sites (photovoltaic)
- Installation of an energy storage device for excess solar energy at the logistics site
- Excess solar energy fed into the local grid • Purchasing certified eco power
- Implementation of energy-saving measures (LED bulbs, light control systems)
- Sustainable mobility concept
- Conversion of fleet to electric vehicles
- 10 E-charging points for electric cars at the Oldentrup site
- 2 E-charging points for cars at the logistics site in Altenhagen
- Compensation of transport emissions (including with Halfar compensation projects)
- Compensation of all company- related emissions through ClimatePartner

community work:
- Support for projects promoting renewable energies in China & India through ClimatePartner

- Acquisition of further electric vehicles
- Installation of further E-charging points
- Expansion of photovoltaic system and installation of an energy storage device at the main site
- Compensation of the $C0_2$ emissions of the warehouse range

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PRODUKT

HALFAR

THE COMPANY_SUSTAINABLE STRATEGY_PRODUCT

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PRODUCT STRATEGIES_ EXAMPLES OF SINGLE ACTIONS

1. All products shall be top-quality and relevant for customers and final users.
Products are the strongest ambassadors from Halfar to the outside world, and products have the greatest impact on resources.

2. e.g. Product quality
environmental impact

→ long-lasting workmanship

→ suitable and high-quality materials,
also recycled materials if applicable

3. MESURE – IMPROVE – SET (NEW) TARGETS

	2019	2020	2021	2022
Lagersortiment				**Ziel**
Anteil PVC-freier Taschen	54 %	62 %	66 %	> 67 %
Anteil Taschen aus nachwachsenden Rohstoffen	9 %	15 %	19 %	= 19 %
Anteil Taschen mit recycelten Stoffen	n.a./*	4 %	11 %	> 13 %
Neuheiten des Lagerprogramms				**Ziel**
Anteil PVC-freier Taschen	90 %	100 %	100 %	= 100 %
Anteil Taschen aus nachwachsenden Rohstoffen	18 %	35 %	45 %	0 %
Anteil Taschen mit recycelten Stoffen	n.a./*	20 %	27 %	> 60 %

**bisher kundenindividuelle Produktion*

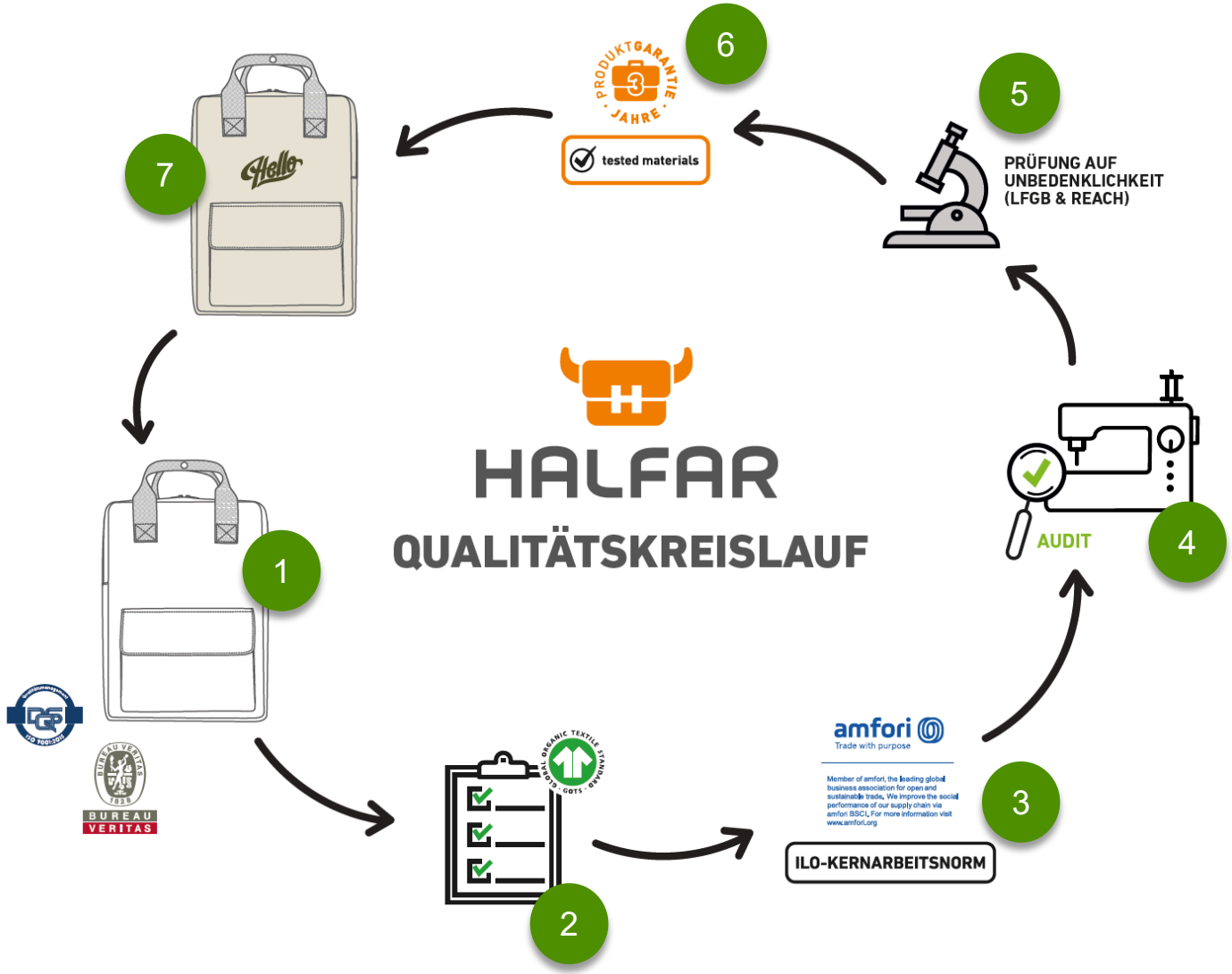
→ Reduce / eliminate PVC from stock items

→ Increase of renewable raw materials in stock range

→ Increase recycling materials in stock range

→ Measure succsess of product range

HALFAR QUALITÄTSKREISLAUF



1-3

- Design and product development under strict quality standards at our own site
  - e.g., GOTS and ISO 9001
- Safeguarding social standards
  - for the entire production chain e.g., ILO Core Labour Standard)

4-6

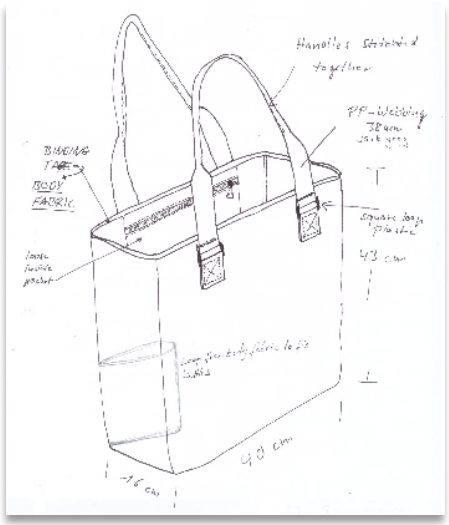
- Compliance with employee rights (audits)
- Audit by independent partners
  - on the safety and legal conformity of the materials
  - on physical-technical properties

7

- Distribution of high-quality products
- Confirmed by self-commitment (tested materials), external quality seals, 3 years warranty

SUSTAINABLE FROM THE IDEA TO THE CUSTOMER

design & development in-house



- sustainable concept right from the start
- contribution of own know-how
- customer benefits, trends, competition at a glance

In-house prototyping

- Prototype development
- Customer- specific solutions
- Optimization of material use (waste avoidance)
- choice of material

production

- in compliance with strict social standards in accordance with amfori BSCI and ILO core labour standards
- assurance through external audits
- regular presence in the plants by our own auditors

quality control

- safety and sustainable use of the products
- ensuring marketability
- confirmed by independent, accredited institutes

SUSTAINABLE FROM THE IDEA TO THE CUSTOMER

decoration of the products

- various finishing techniques for optimal brand presentation
- high quality standards for finishing

storage and dispatch

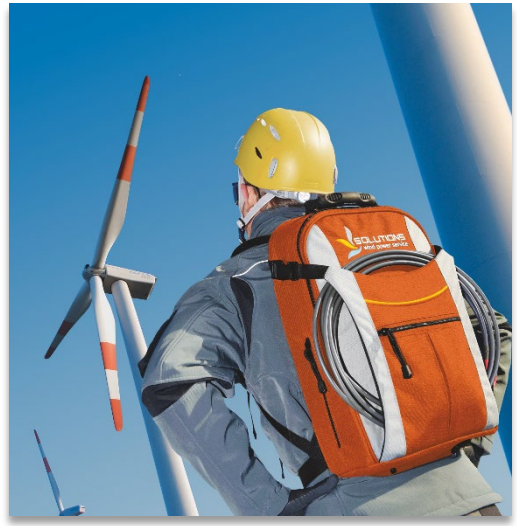
- large in-house storage capacities
- offering individual logistics solutions for customers
- short distances and high flexibility

distribution of the products

- ingredients & production = harmless
- independent, proprietary design
- optimized functionality = high benefit
- high product quality = longevity
- high contact rates of the advertised brand

  = **Sustainable advertising products**

customized solutions



- individual material selection
- extensions of standard products
- adaptation to special requirements
- tailor-made for use

= **high individual benefit**

SUSTAINABLE FROM THE IDEA TO THE CUSTOMER - AND BEYOND

offer services to extend the life of the product

- **HALFAR® REPAIR SERVICE**

offer services to extend the life of materials

- In addition to their uniqueness, upcycled bags always stand for sustainability - one reason why we love the idea of upcycling so much at HALFAR®. After all, we use materials for the bags that would otherwise have ended up in the trash or in a use that wouldn't quite do justice to the value and usefulness of the material. By upcycling, we bring value to raw materials and supplies. And of course, we're also saving valuable resources because these bags require no or significantly fewer new materials to be produced.

and so on ☺

SUSTAINABLE PRODUCT LABELS

- Halfars own quality assurance system
- OEKO-TEX® certified products
- GRS certified products made from recycled materials
- products made from GOTS certified organic cotton
- Fairtrade certified product
- products made in Europe
- climate compensated products

tested materials

15.HIN.714 ENSTEIN HTTI

FAIRTRADE COTTON

GLOBAL ORGANIC TEXTILE STANDARD · GOTS ·

Global Recycled Standard

"Halfar is GRS certified. Only the products which are covered by a valid transaction certificate are GRS certified."

certified by CU 1047624

MADE IN EUROPE

HALFAR

AKTIONSFELD

NATUR

THE COMPANY_SUSTAINABLE STRATEGY_ ENVIRONMENT

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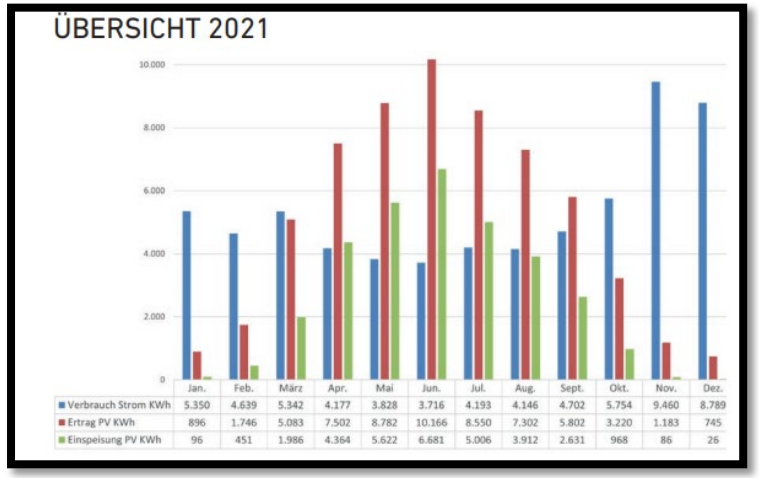
ENVIRONMENT _ EXAMPLES OF SINGLE ACTIONS

1. Establishment and maintenance of an **infrastructure** (buildings, machinery, etc.) that is economically viable and meets the highest possible environmentally compatible and climate-friendly standards

2. e.g. invest in buildings, equipment and process
   - photovoltaics
   - sustainable logistics location

3. MESURE – IMPROVE – SET (NEW) TARGETS



	Jan.	Feb.	März	Apr.	Mai	Jun.	Jul.	Aug.	Sept.	Okt.	Nov.	Dez.
Verbrauch Strom KWh	5.350	4.639	5.342	4.177	3.828	3.716	4.193	4.146	4.702	5.754	9.460	8.789
Ertrag PV KWh	896	1.746	5.083	7.502	8.782	10.166	8.550	7.302	5.802	3.220	1.183	745
Einspeisung PV KWh	96	451	1.986	4.364	5.622	6.681	5.006	3.912	2.631	968	86	26

- change to green electricity
- expansion of e-mobility
- expansion of photovoltaic system and installation of an energy storage device at the main site

OUR LOCATIONS_KEY FIGURES

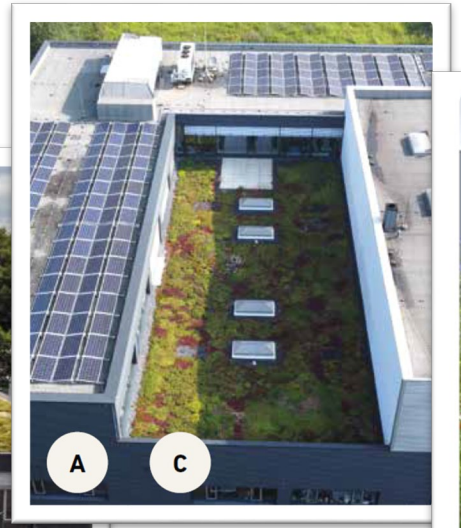
Headquarters Bielefeld/Oldentrup

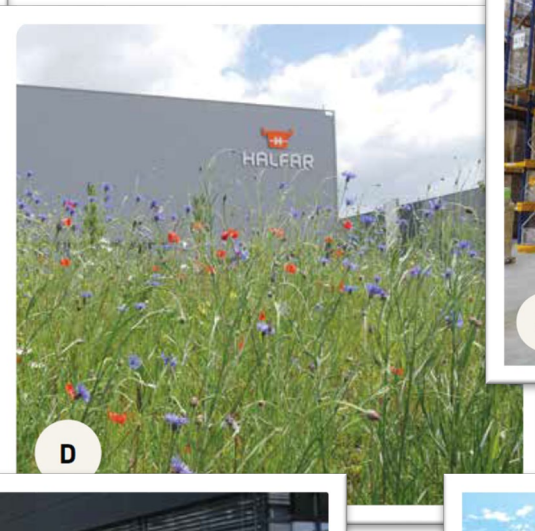
Logistics location Bielefeld/Altenhagen

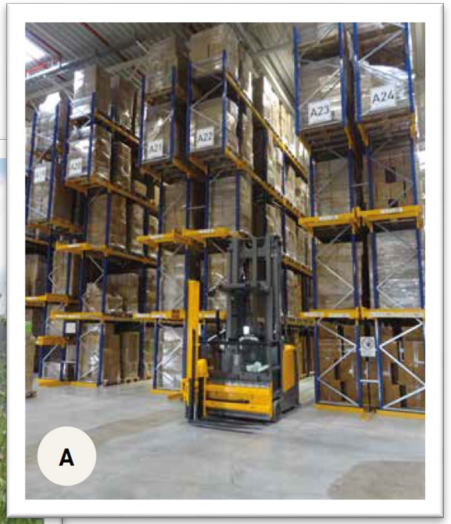
- Buildings 100% CO2 neutral due to:
  - green electricity (e.g., photovoltaic system)
  - heating without fossil fuels
  - LED bulbs and lighting control
  - green roofs and compensation areas

- Additional:
  - paperless documents
  - reduction of water consumption by means of aerators
  - CO2-neutral shipping
  - 100% CO2-neutral company (Climate Partner)

THE COMPANY_SUSTAINABLE INFRASTRUCTURE







A photovoltaics + green electricity
B pellet heating
C green roofs and areas
D lean meadows
E e-charging stations

OUR LOCATIONS_ENVIRONMENTAL MEASURES

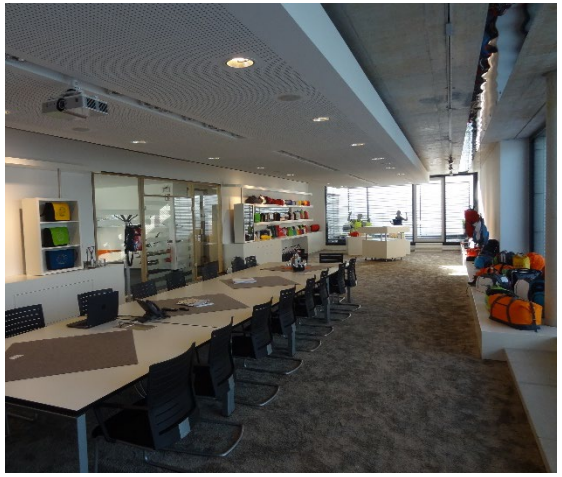
powerful PV systems

- PV systems with 70 kWp at both locations, expansion to 99 kWp in Q1/2023 at the headquarters
- additional 24 kWh electricity storage at the logistics site
- any additional demand is covered by green electricity

climate-friendly building heating

- environmentally friendly pellet heating at the main site
- energy-efficient eco-gas heating at the logistics location

implementation of energy-saving measures



- economical LED lighting
- lighting control (presence detector & time control)
- electronic archiving system, paperless invoicing, etc.

areas greening actions to biodiversity

- a total of over 1500 m² planted in an insect-friendly way
- since August 2022 also certified by Insect Respect® as a partner in insect promotion

OUR LOCATIONS – ENVIRONMENTAL MEASURES

charging infrastructure

- E-charging options for employees and customers
- 10 at the main location & 2 at the logistics site
- 100 % green electricity

E-mobility

- 7 all-electric vehicles
- 4 plug-in hybrid vehicles

mobility offers for employees

- subsidy for a company bicycle
- promotion of public transport tickets

JOBRAD HALFAR-DRIVE moBiel JOBTICKET

boosting biodiversity

- a wide range of regional plants
- structures such as piles of stones and dead wood
- lean-meadow at the logistics site
- alternately moist surfaces

MEMBERSHIPS & CERTIFICATIONS

- environmental management system ISO 14001:2015
- member of the ÖKOPROFIT® club
- climate-neutral company
- GRS certified
- GOTS certified
- member of the B.A.U.M e.V.
- EcoVadis certification

ÖKOPROFIT
Regiopolregion Bielefeld 2022

Klimaneutral Unternehmen
ClimatePartner.com/16142-2108-1001

Global Recycled Standard

"Halfar is GRS certified. Only the products which are covered by a valid transaction certificate are GRS certified."

certified by CU 1047624

GOLD 2022 ecovadis Sustainability Rating

B.A.U.M.

AKTIONSFELD

MENSCH

HALFAR

THE COMPANY_SUSTAINABLE STRATEGY_PEOPLE

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PEOPLE_EXAMPLES OF SINGLE ACTIONS

1. Promote a sustainable mindset and behaviors at all levels of the company to ensure that sustainability is and remains an integral part of the **corporate culture**

2. internal and external communication of
   - company values
   - working conditions internal / external

   → code of conduct
   → flexible place and working time as far as possible considering job roles
   → education and training
   → use CSR-certificates

3. MESURE – IMPROVE – SET (NEW) TARGETS

Anzahl Auszubildende	15
Ausbildungsberufe	6
Durchschnittliche jährliche Schulungsstunden pro Mitarbeiter	5,2 h
Anteil der Mitarbeiter, die als Erst- und /oder Brandschutzhelfer geschult wurden.	20 %
Anteil der Mitarbeiter, die ein regelmäßiges Feedbackgespräch erhalten	100 %
Anteil der Mitarbeiter, die an dem Job-Rotation-Programm teilgenommen haben	23 %

→ implement an intranet for transparent internal communication

→ implement education, job training and further trainings on company's values as well as programs like “job rotation”

→ introduction and continuation of a sustainable feedback culture

CSR (CORPORATE SOCIAL RESPONSIBILITY) IN BUSINESS OPERATIONS

safe working conditions in production

social standards

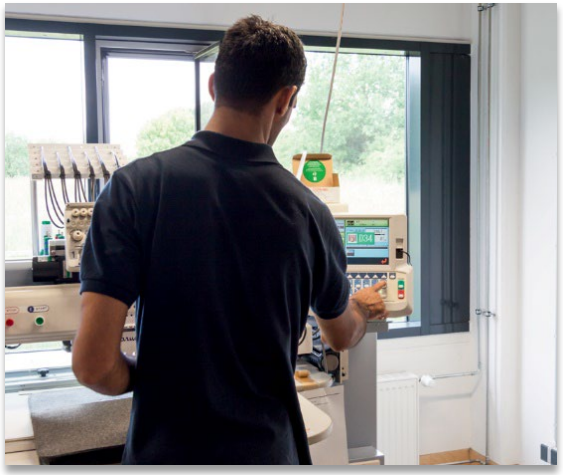
according to amfori BSCI

and ILO core labour standard

integrative screen printing company in-house

close cooperation with prosigno

integration of refugees



cooperation with REGE (Regionale Personalentwicklungs-gesellschaft mbH)

integrative workplaces for people with disabilities

cooperation with the Werkhaus GmbH

COMMUNITY ENGAGEMENT

Support for charitable projects (regional)

donations to Glückstour & Fruchtalarm, among others

Support for charitable projects (nationwide)

pocket donations
(Sri Lanka, refugees, Tafel Bielefeld etc.)

Biodiversity project

initiator and member of Insect Aid

partner of insect respect

Promoting youth and young talent

cooperation with Realschule Heepen (e.g., donation of readers' backpacks, offer of internships)

WORKING IN THE COMPANY

ergonomically designed workstations

- height-adjustable desks to relieve the strain on the back
- PU soft mats for primarily stationary workplaces
- exo skeletons in logistics

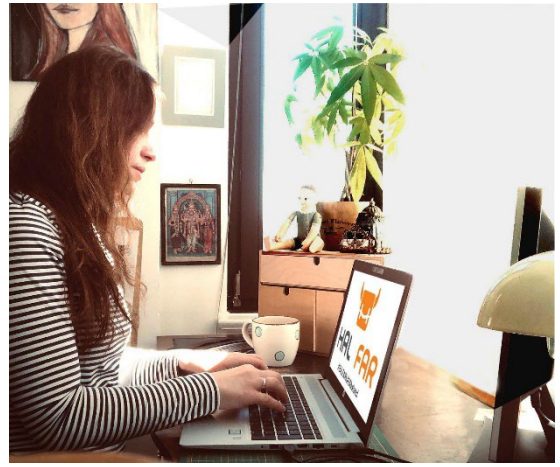
open workspaces for networking

- the latest construction phase was designed as an open "co-working area"
- promotes collaboration, communication and community in the team

quiet areas for individual work

- rooms for undisturbed work
- allow yourself to treat yourself to moments of rest for a short time

flexible working time models and mobile working



- improve work-life balance
- increase employee motivation and satisfaction

WORKING IN THE COMPANY

fruit and vegetable baskets for employees

- once a week a basket of organic fruit and vegetables per department
- increase the ability to concentrate
- promote a healthy and conscious diet

employee involvement

- internal communication (digital & analogue)
- suggestion scheme for general and sustainability topics (Green Post)

continuing education and training offerings

- regular internal training
- occasional and task-related external training
- offer of individual and group coaching services

training cooperation with regional textile company

- trainees from both companies learn for a certain period of time in the other company
- imparting a broad range of knowledge

WORKING IN THE COMPANY

bagground Day in the company

- information day for apprentices and their families facilitates the entry into the company

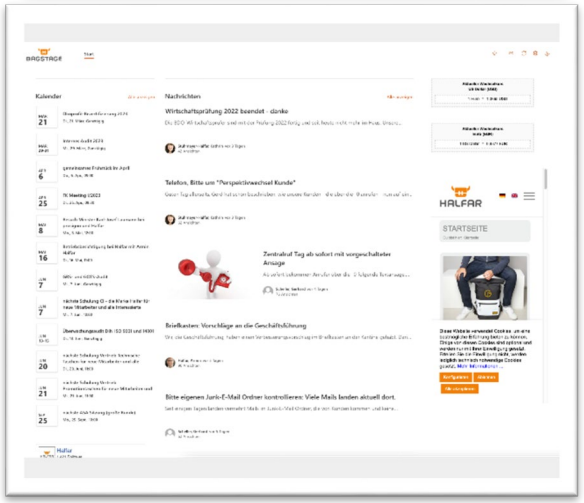
Job Rotation program

- opportunity to get to know other workplaces
- expands expertise & increases understanding

joint monthly breakfast

- within the framework of working hours
- opportunity to exchange ideas with each other
- information on current events, new colleagues, anniversaries

internal communication



- internal communication via the intranet (VivaConnect)
- current topics can be viewed by everyone at any time

AWARDS & CERTIFICATES

- member of amfori BSCI
- awarded „excellent family friendly"
- multiple winner (overall winner 2021 & 2022) of the PSI sustainability award
- winner of the DQS Sustainability Heroes Award 2020
- winner of the CSR award OWL 2018 and 2022

amfori Trade with purpose

Member of amfori, the leading global business association for open and sustainable trade. We improve the social performance of our supply chain via amfori BSCI. For more information visit www.amfori.org

Familien Freundliches Bielefeld

PSI SUSTAINABILITY AWARDS

SUSTAINABILITY HEROES 2020
HALFAR System GmbH
Diversität

CSR-PREIS OWL

THANKS

for your attention!

HS'BI Hochschule Bielefeld University of Applied Sciences and Arts

BiCAB Bielefeld International Conference on Applied Business

BRIEF SUMMARY AND QUESTIONS

10:10-11:30 Uhr

Hochschule Bielefeld
University of Applied Sciences and Arts

BiCAB
Bielefeld International Conference on Applied Business

COFFEE BREAK

10:30-11:50 Uhr

Hochschule Bielefeld
University of Applied Sciences and Arts

BiCAB
Bielefeld International Conference on Applied Business

SESSION 1 CHAIR: PROF. DR. ELA SIBEL BAYRAK MEYDANOĞLU

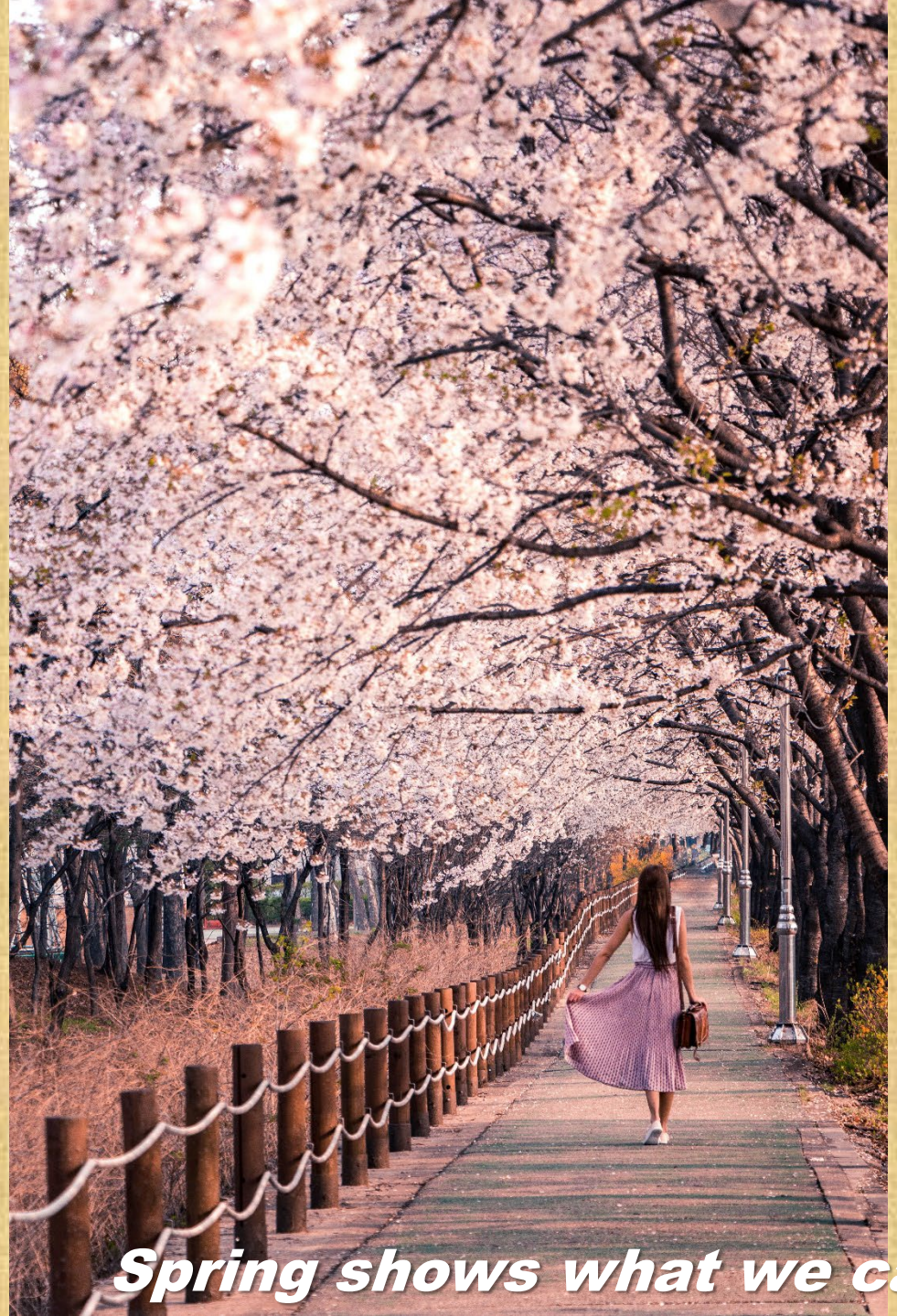
Hochschule Bielefeld
University of Applied Sciences and Arts

BiCAB
Bielefeld International Conference on Applied Business

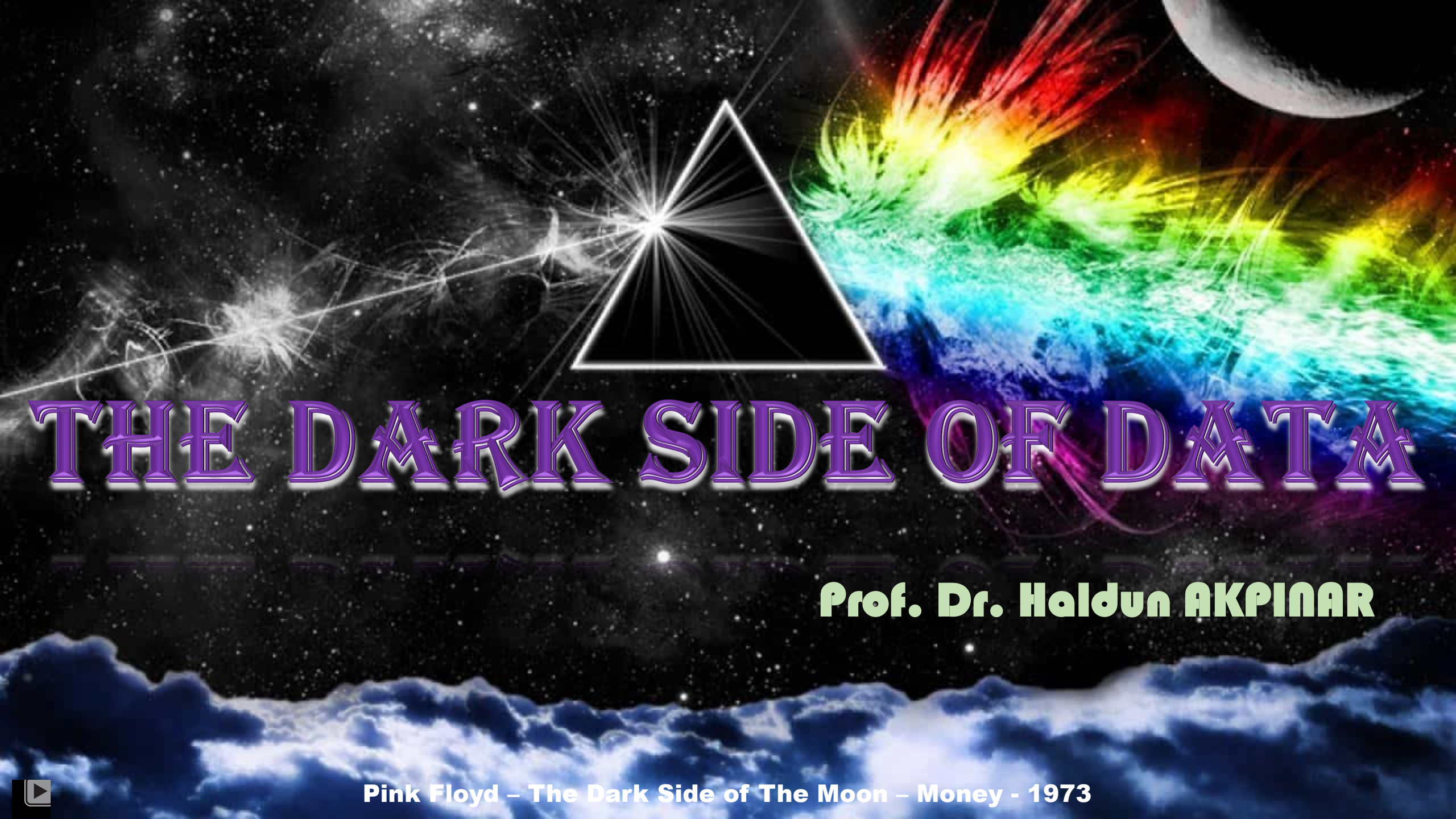
THE DARK SIDE OF DATA

Haldun Akpinar, Marmara University, Istanbul/Turkey

11:50-12:10 Uhr

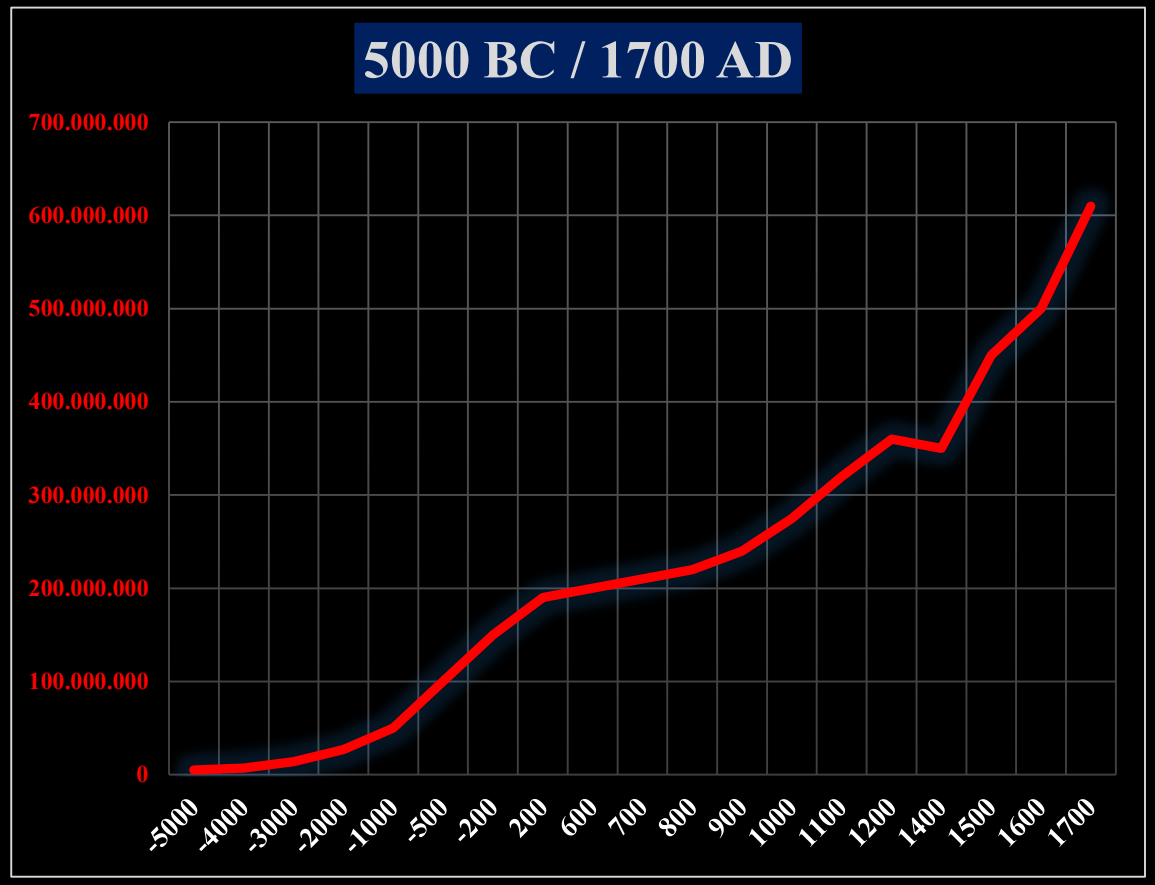


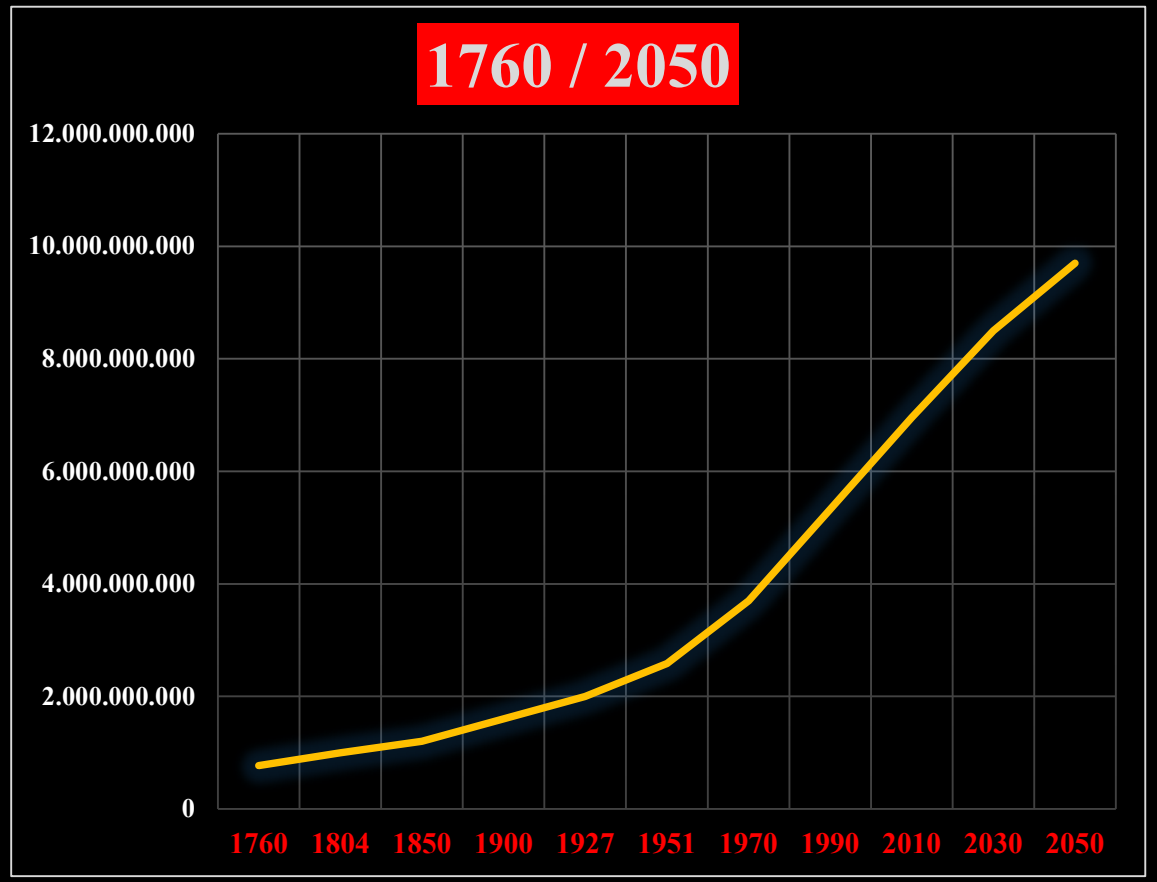
Spring shows what we can do with a dark and dirty world


THE DARK SIDE OF DATA
Prof. Dr. Haldun AKPINAR
Pink Floyd – The Dark Side of The Moon – Money - 1973


We live in a world where the world population is expected to reach 9.8 billion in 2050.
The Aral Sea, once the fourth largest lake in the world, has already been destroyed

World Population





Aral Sea or Aral Desert

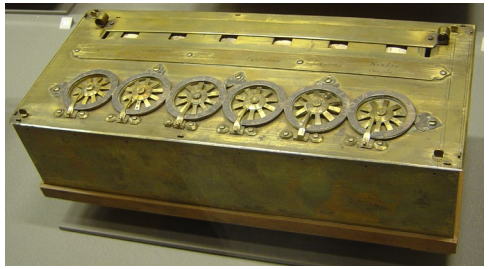

Borgen Magazine

Abacus
BC 2400

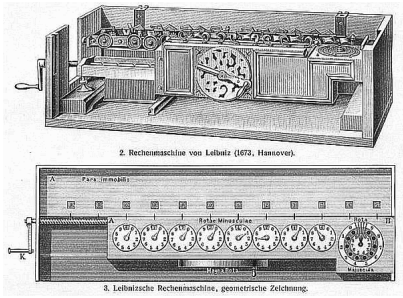
Astrolabe
Classical Antiquity

Antikythera Mechanism
Ancient Greek

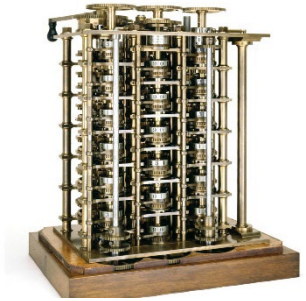
Schikard – Rechenuhr
Ca. 1640



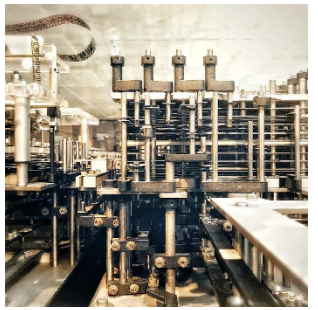
Pascal - Pascaline
1640



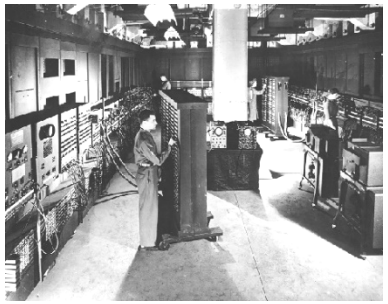
Leibniz – Stepped Reckoner
1671



Babbage – Difference Engine
1822



Zuse – Zuse 1
1938

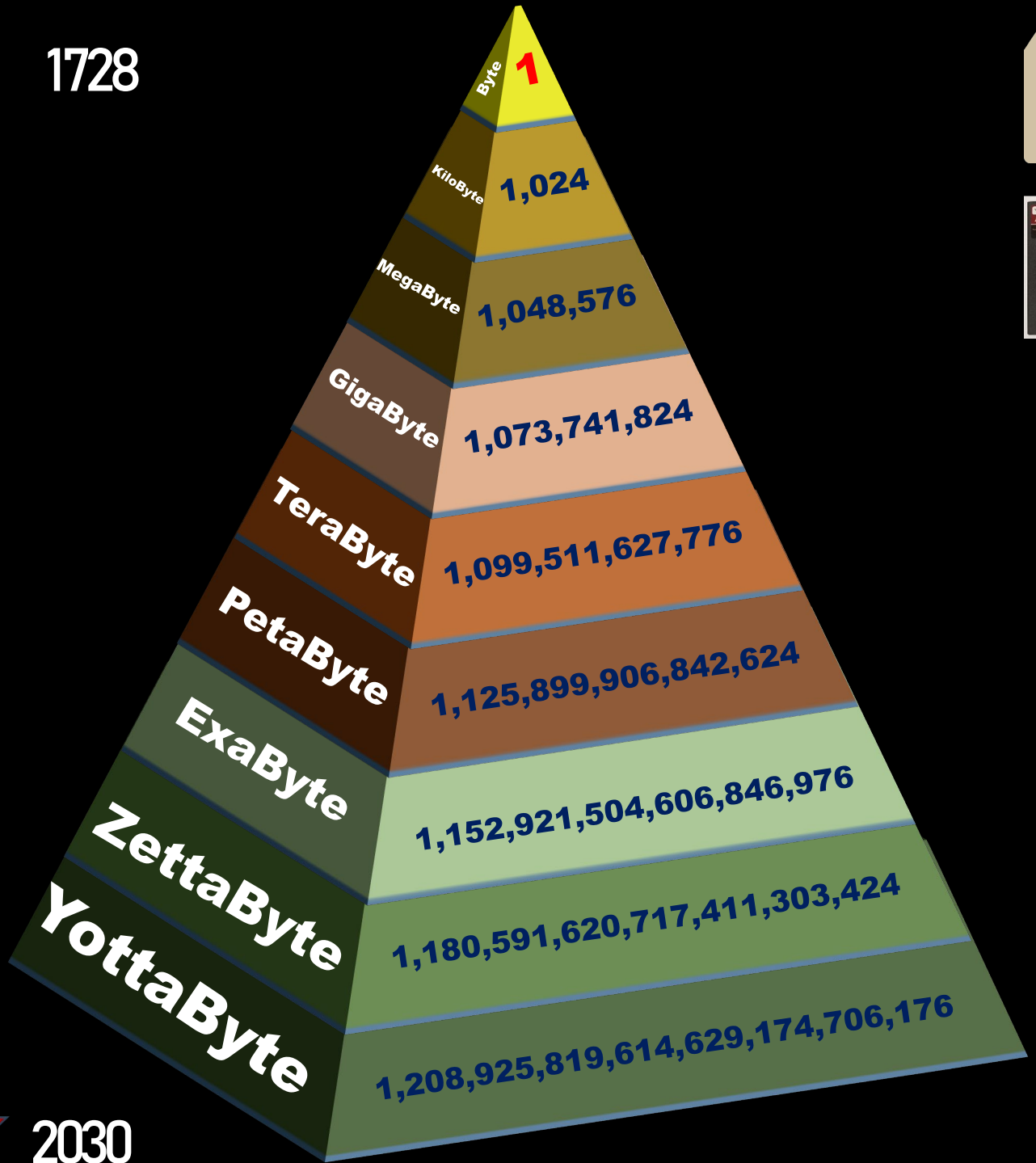


ENIAC
1946

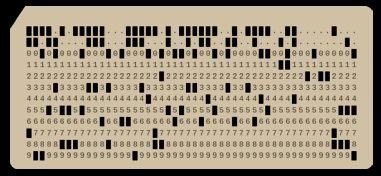
Apple
1976

EVOLUTION OF COMPUTATION

1728



2030



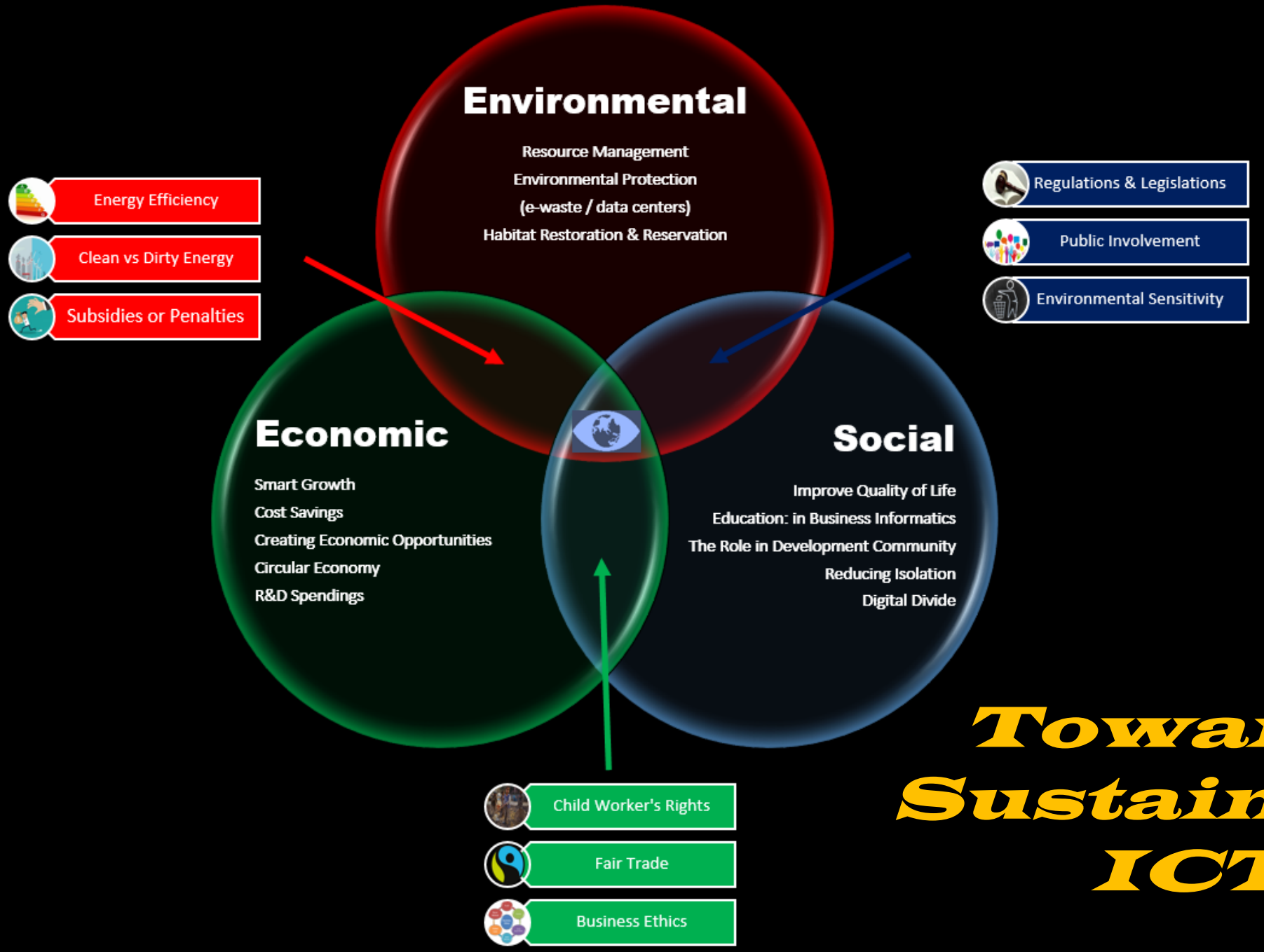
Punch Card – 80 Bytes

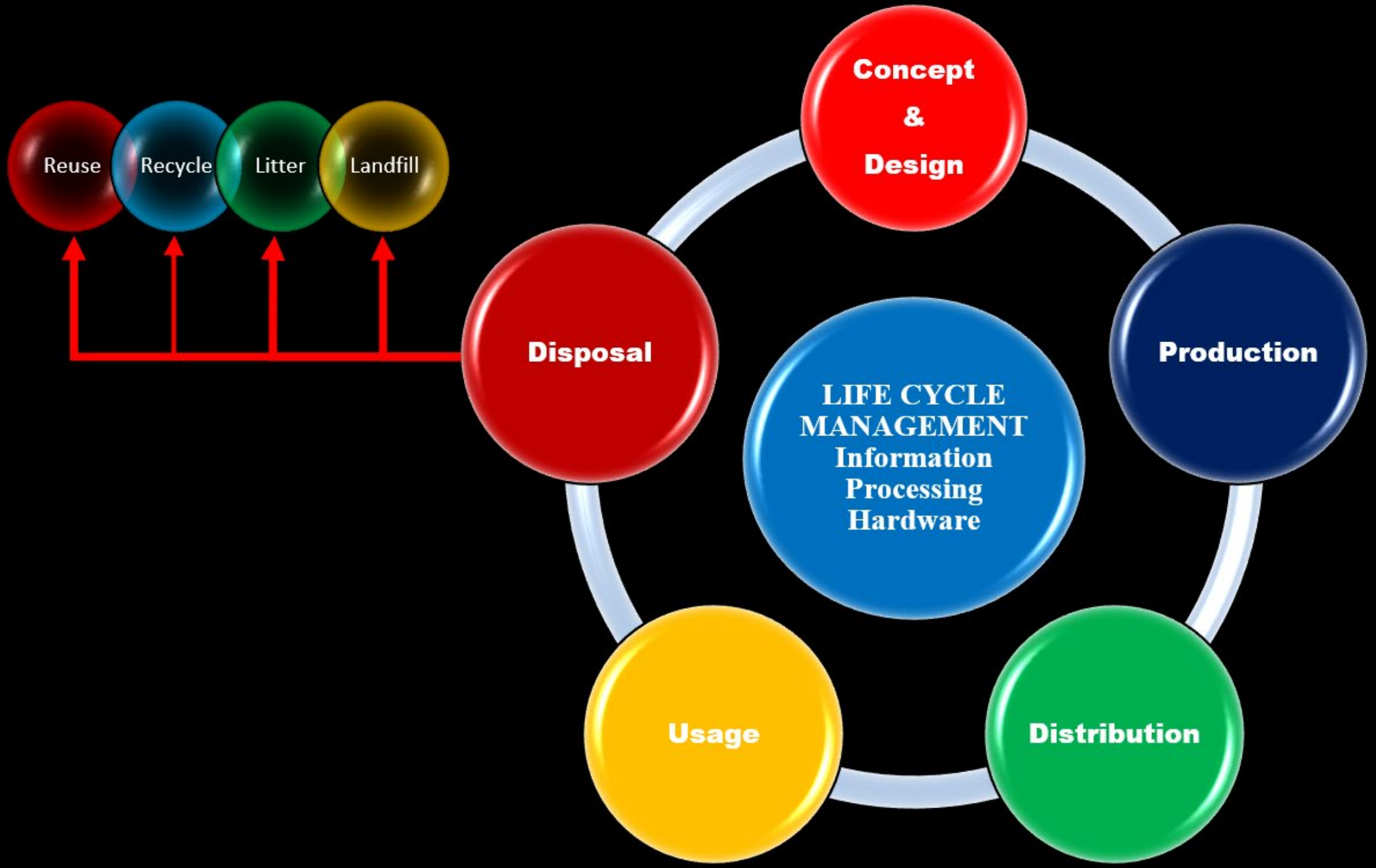
Floppy Disks– MegaBytes

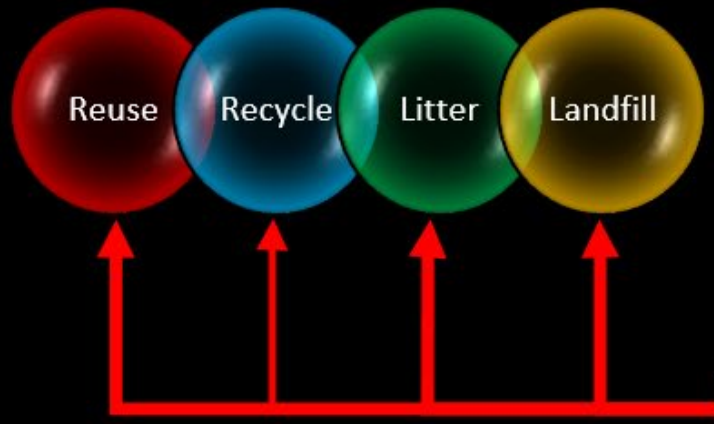
Floppy Disks– TeraBytes

Data Centers– ExaBytes

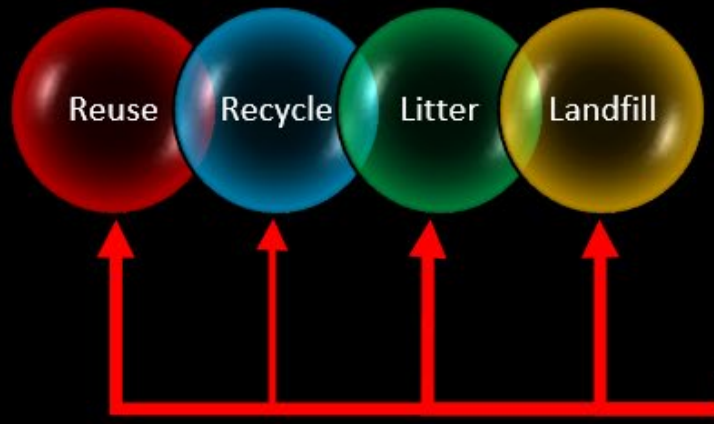
Towards Sustainable ICT

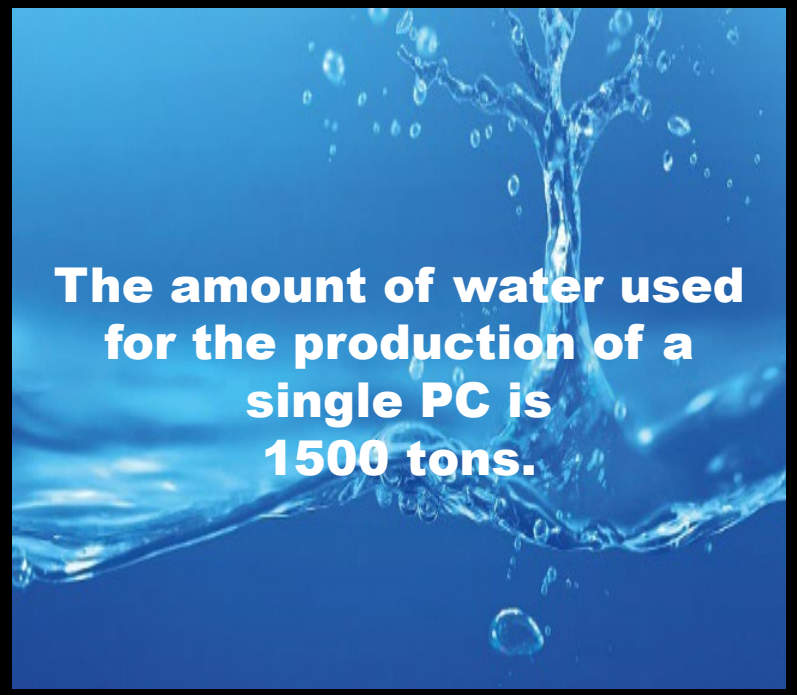


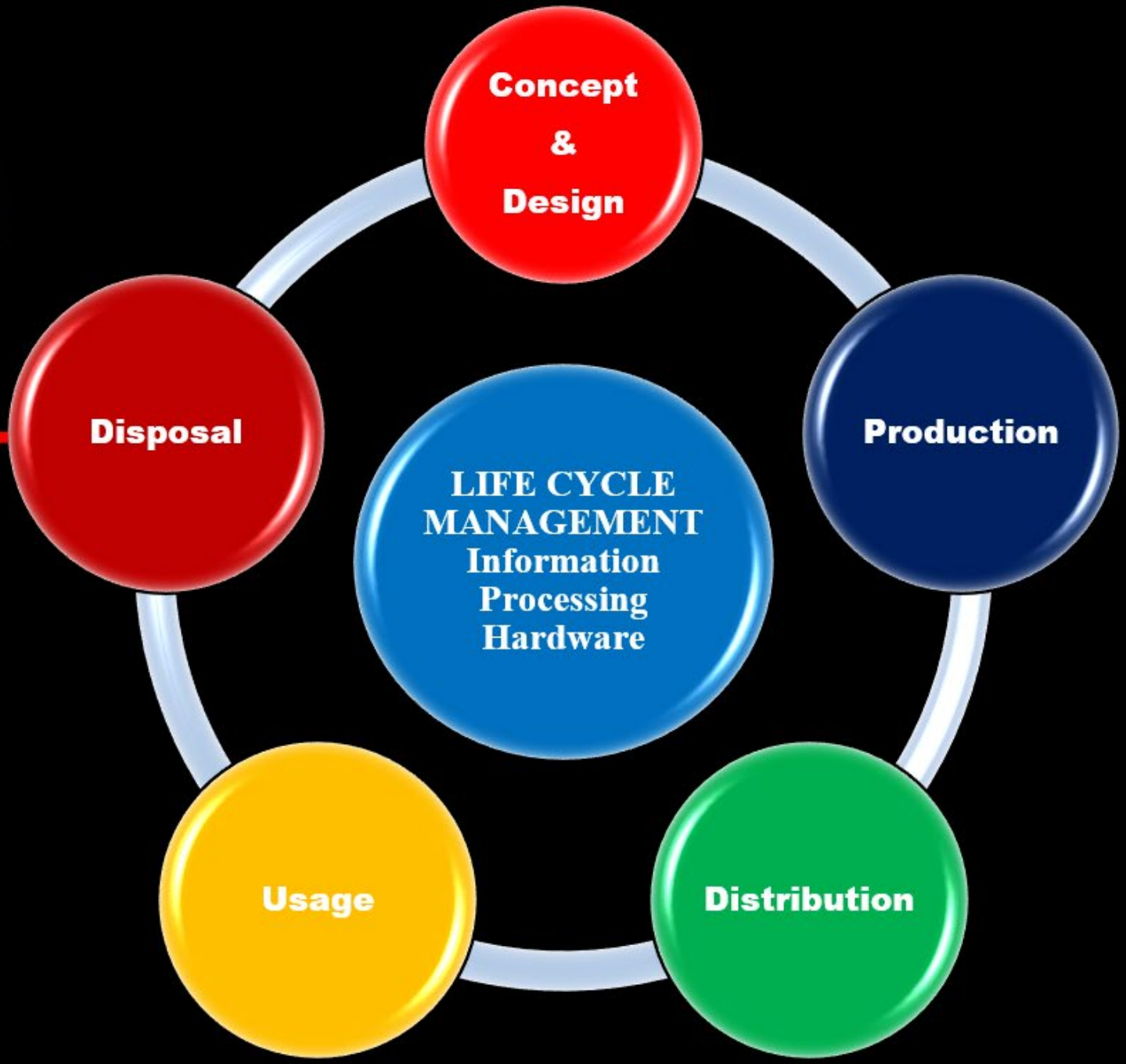

Reuse
Recycle
Litter
Landfill
Concept & Design
Production
Distribution
Usage
Disposal
LIFE CYCLE MANAGEMENT
Information Processing Hardware

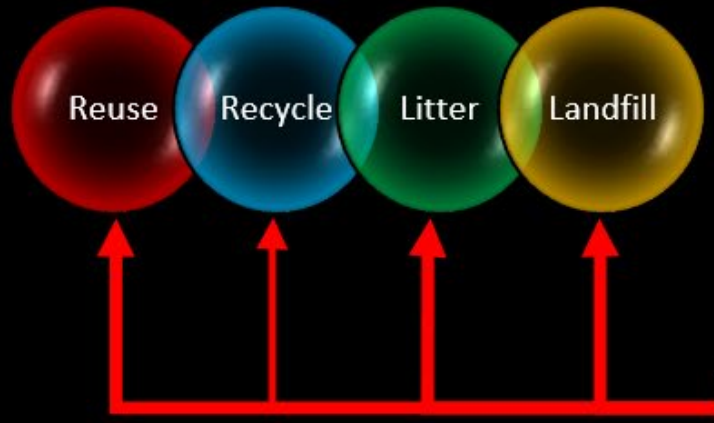

Reuse
Recycle
Litter
Landfill


Concept & Design
Production
Distribution
Usage
Disposal
LIFE CYCLE MANAGEMENT
Information Processing Hardware

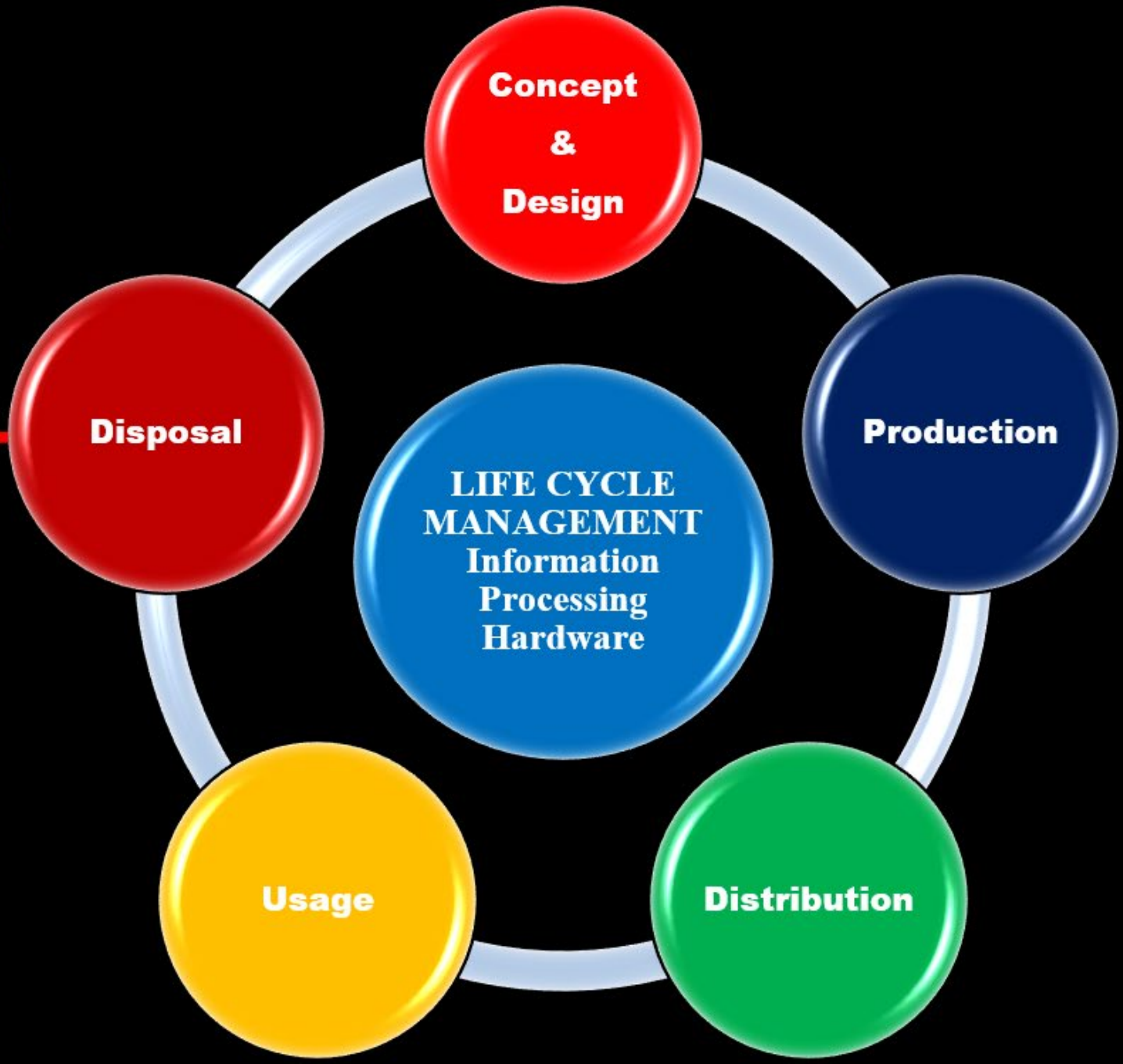

Reuse
Recycle
Litter
Landfill


The amount of water used for the production of a single PC is 1500 tons.


Concept & Design
Production
Distribution
Usage
Disposal
LIFE CYCLE MANAGEMENT
Information Processing Hardware


Reuse
Recycle
Litter
Landfill


For a Hamburger
2.25 tons.


Concept
&
Design
Production
Distribution
Usage
Disposal
LIFE CYCLE
MANAGEMENT
Information
Processing
Hardware

manufacturers desire to sell more computers and smartphones

consumers wish to use the latest models constantly

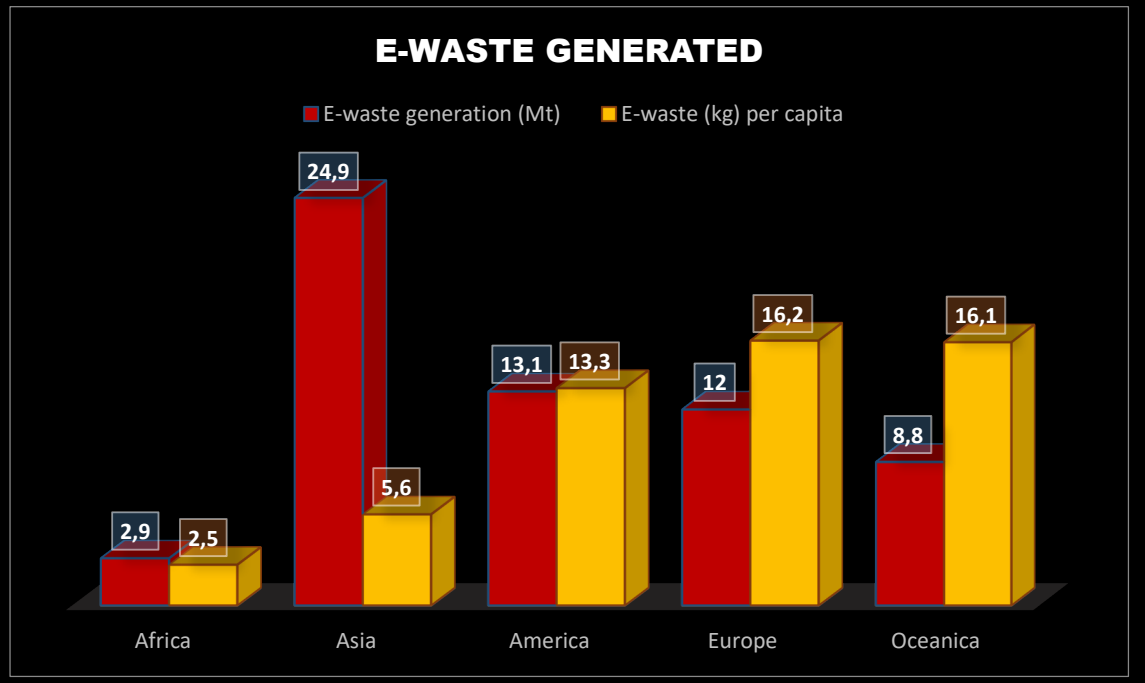
Recycle

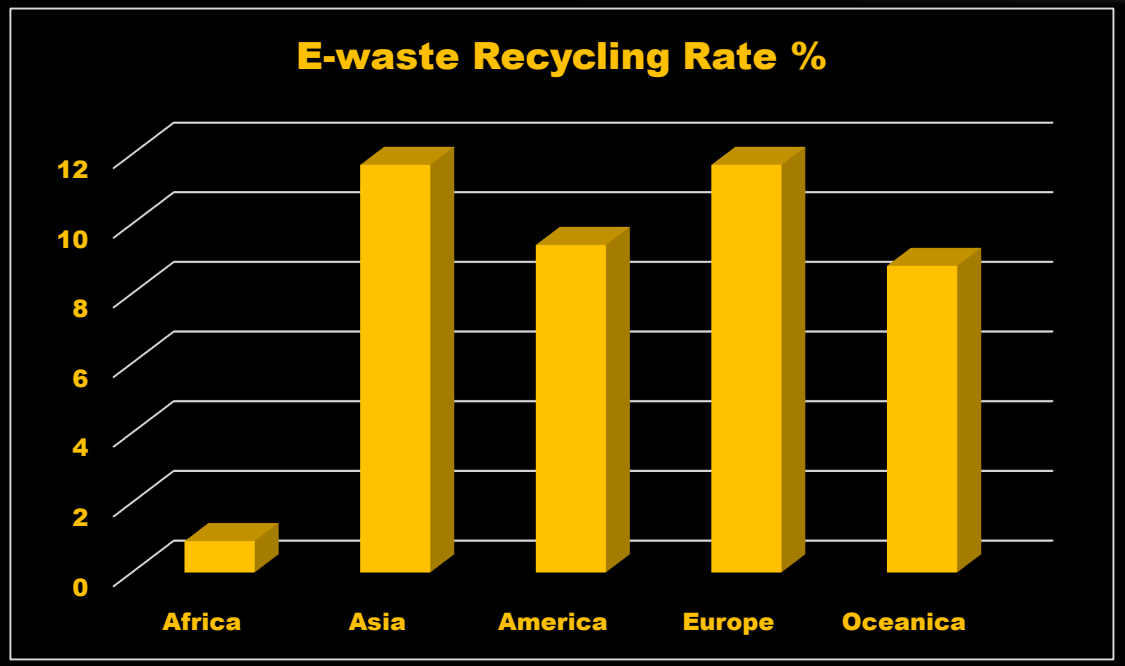
Litter

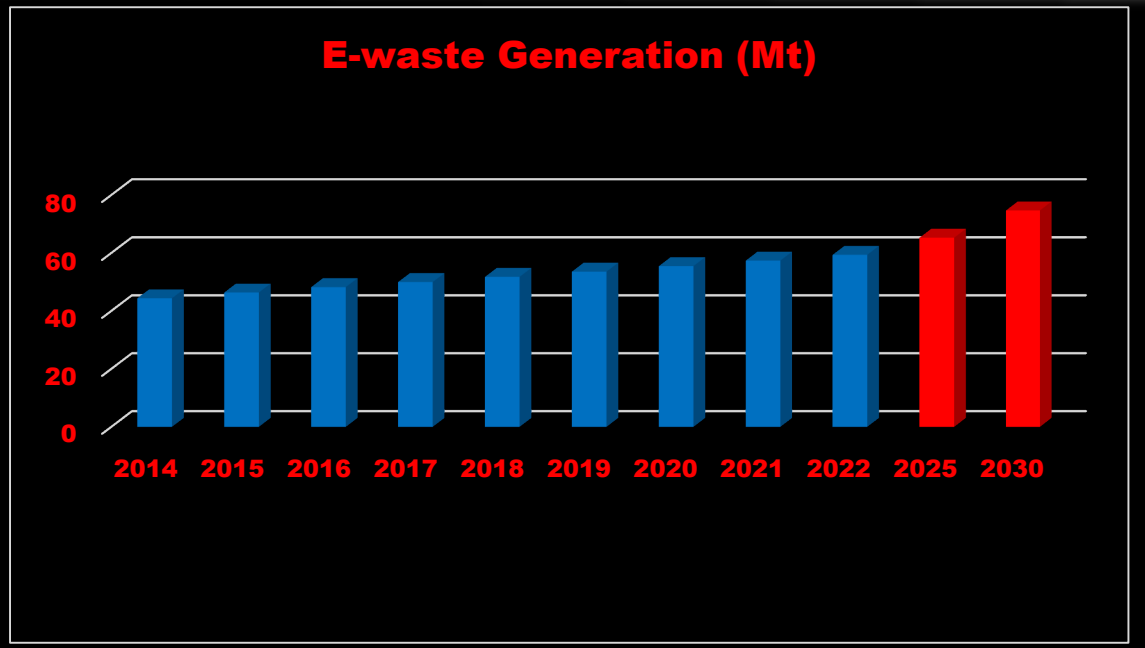
Reuse

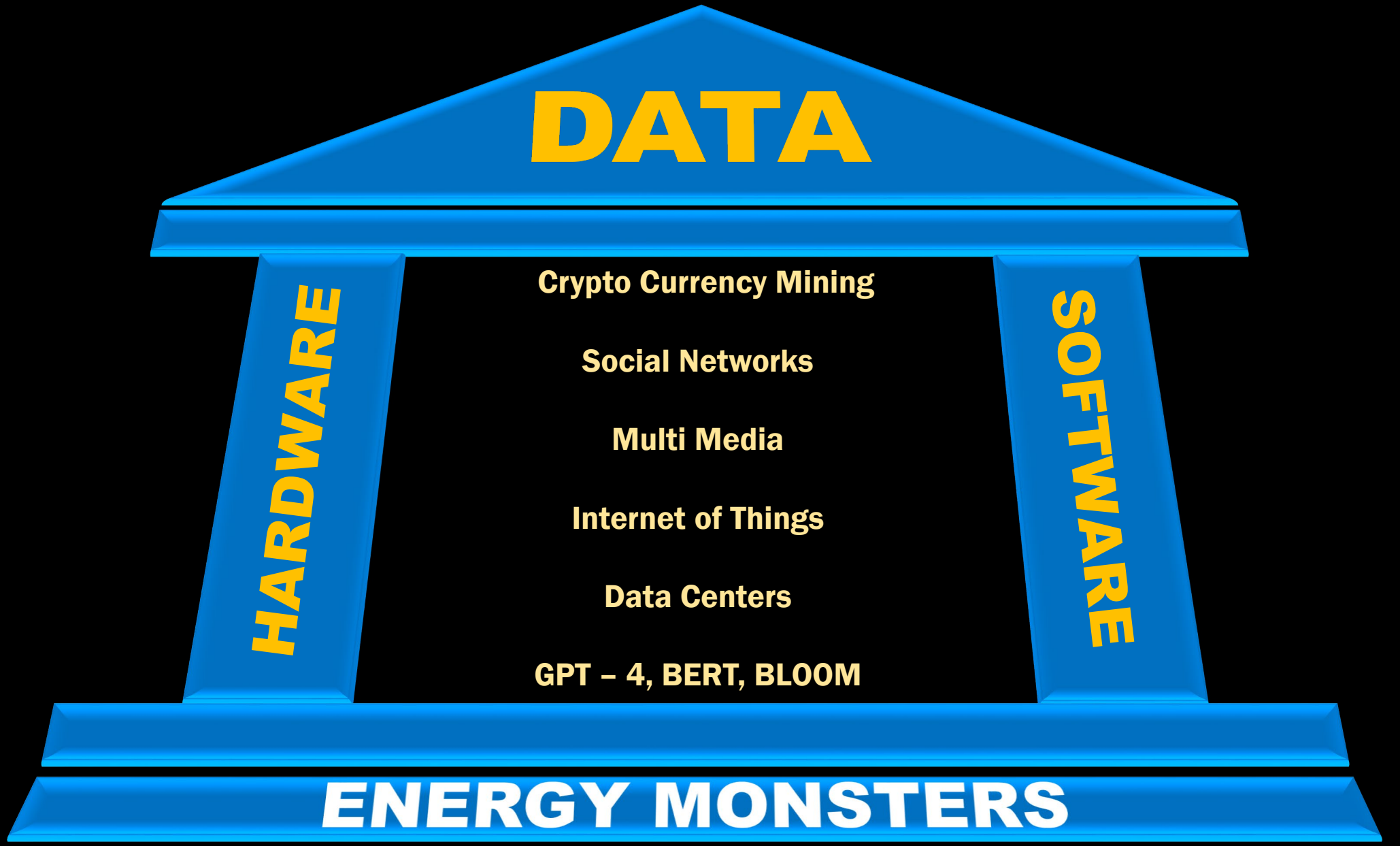
Landfill

- ✓ **57.4 Mt (Million Metric Tonnes) of e-waste was generated in 2021. The total is growing by an average of 2 Mt a year.**
- ✓ **There is over 347 Mt of unrecycled e-waste on earth in 2023.**
- ✓ **China, the US, and India produce the most e-waste.**
- ✓ **Only 17.4% of e-waste is known to be collected and properly recycled.**








DATA
HARDWARE
SOFTWARE
Crypto Currency Mining
Social Networks
Multi Media
Internet of Things
Data Centers
GPT – 4, BERT, BLOOM
ENERGY MONSTERS

A Short Story of Cryptocurrency Miners

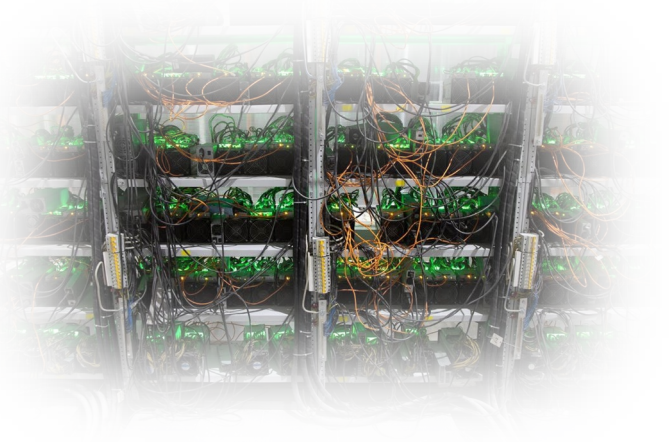
From Hell to Heaven

September 2021:
China outlawed all crypto trading and transactions

Late 2021:
between 60 and 70 percent of Bitcoin's mining network relocated to Kazakhstan.

And again to Hell

Power Blackouts & Internet Shutdown

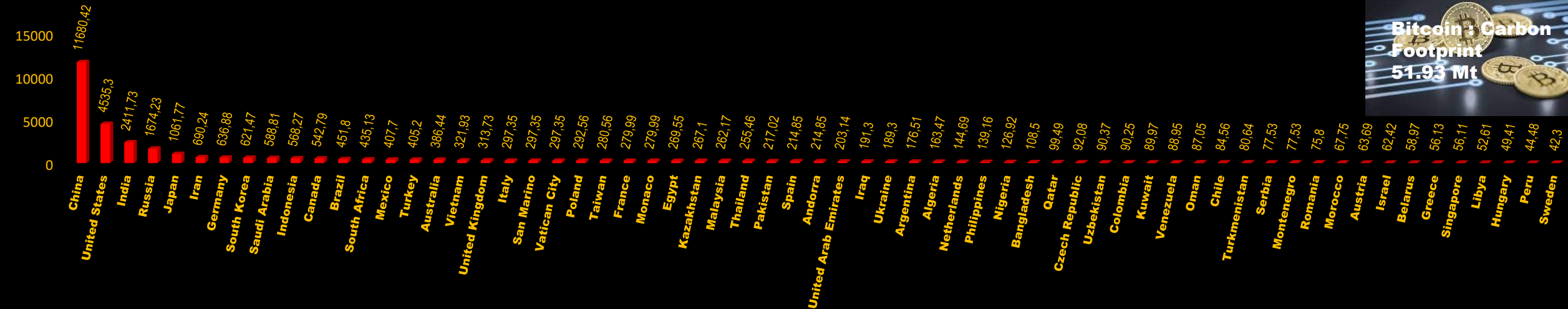


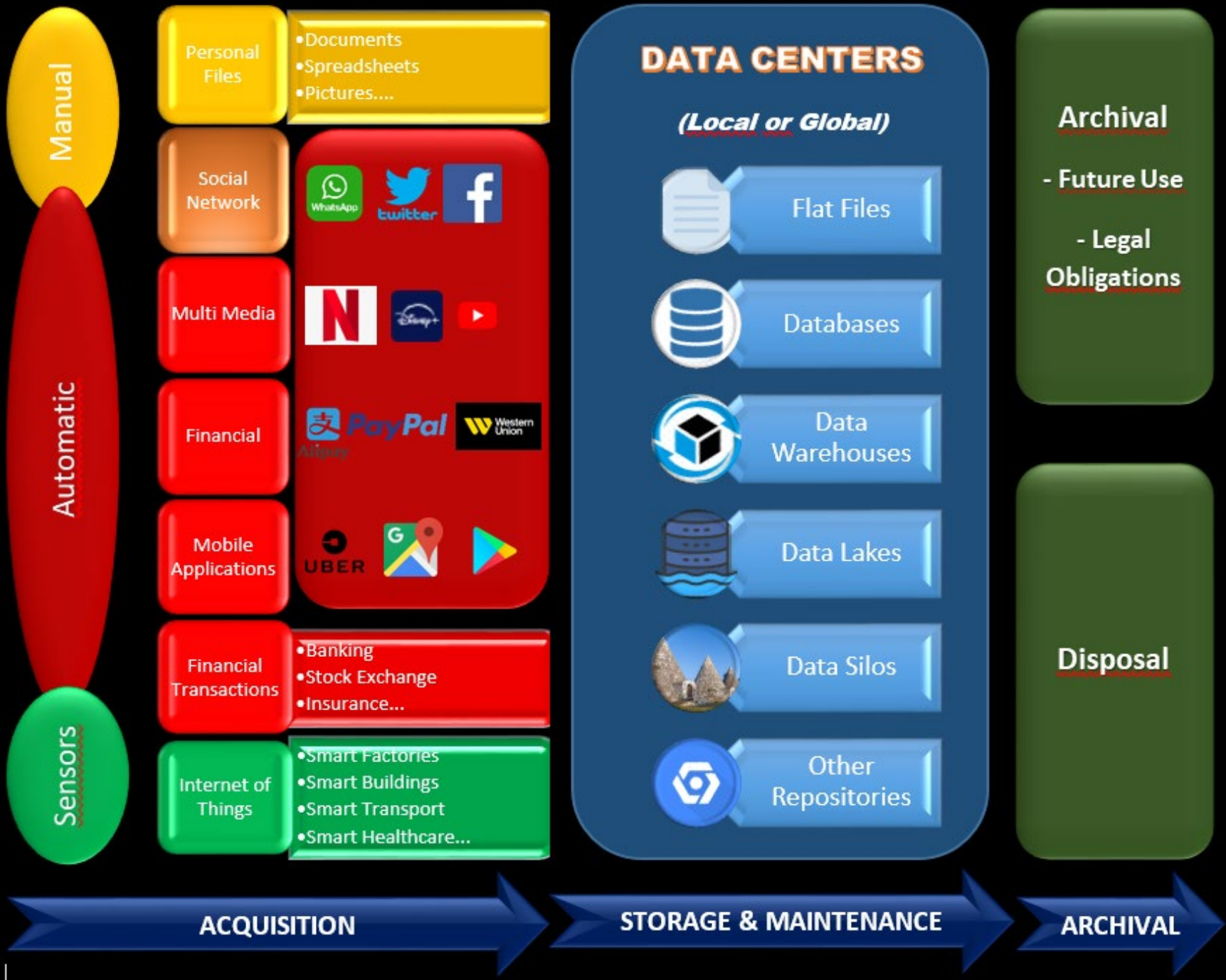
January 2022:
Energy Crisis and massive protests erupted throughout Kazakhstan

March 2022:
Frozen machines and desperate miners

Electricity Consumption Billion KWh - 2022

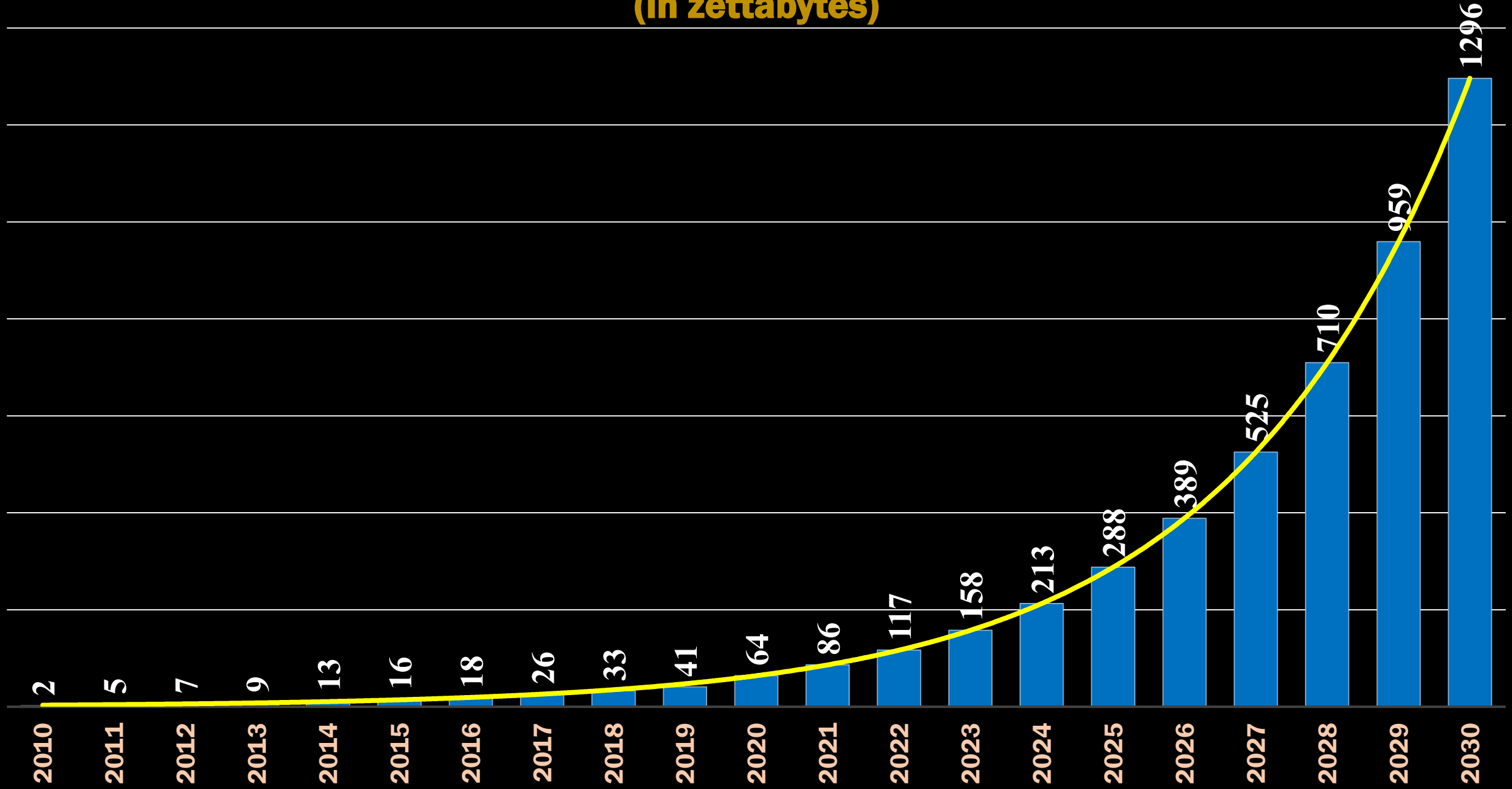
CO2 Emissions (Mt - 2020)

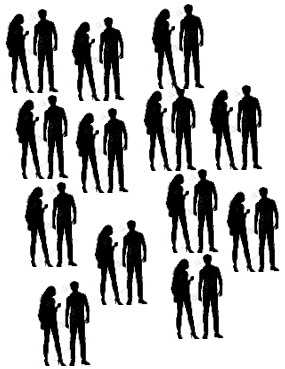



Manual
Automatic
Sensors
Personal Files
•Documents
•Spreadsheets
•Pictures....
Social Network
Multi Media
Financial
Mobile Applications
Financial Transactions
•Banking
•Stock Exchange
•Insurance...
Internet of Things
•Smart Factories
•Smart Buildings
•Smart Transport
•Smart Healthcare...
DATA CENTERS
(Local or Global)
Flat Files
Databases
Data Warehouses
Data Lakes
Data Silos
Other Repositories
Archival
- Future Use
- Legal Obligations
Disposal
ACQUISITION
STORAGE & MAINTENANCE
ARCHIVAL

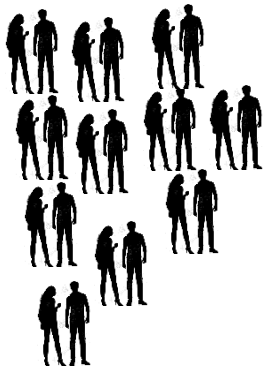
Volume of Data from 2010 to 2030

(in zettabytes)





5.3 billion people have internet connections



4.75 billion people are social media users

more than 300 million computers and more than 1 billion smartphones worldwide are sold in 2022

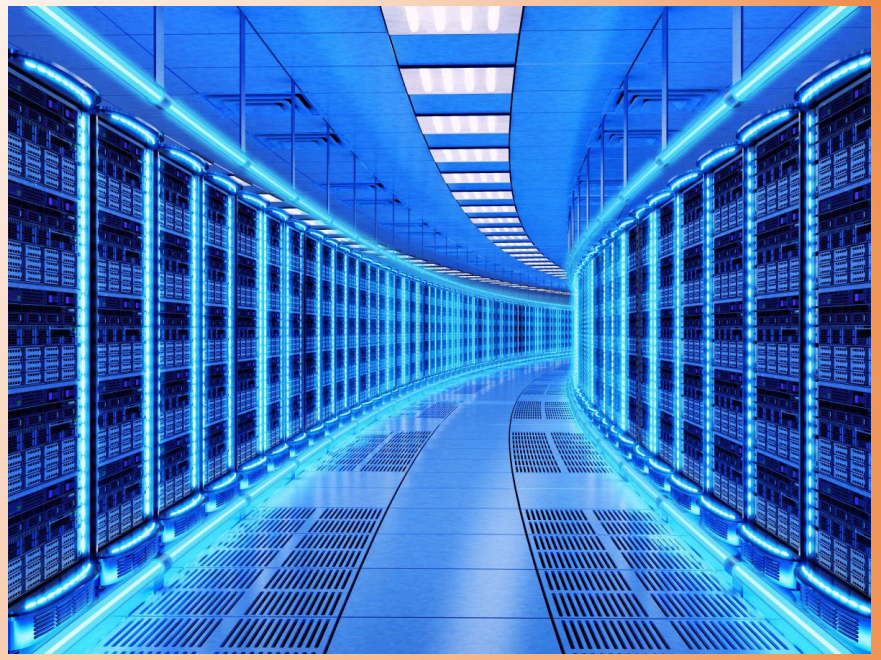
- The number of messages shared per minute approaches 50 million.
- The number of photos is per minute more than 150 thousand.
- An estimated 330 billion emails are sent and received in one day, of which 60-70% are spam.
- The amount of data produced daily is 2.5 petabytes.
- The data volume of IoT connections is estimated to be 13.6 and 79.4 zettabytes in 2019 and 2025, respectively.

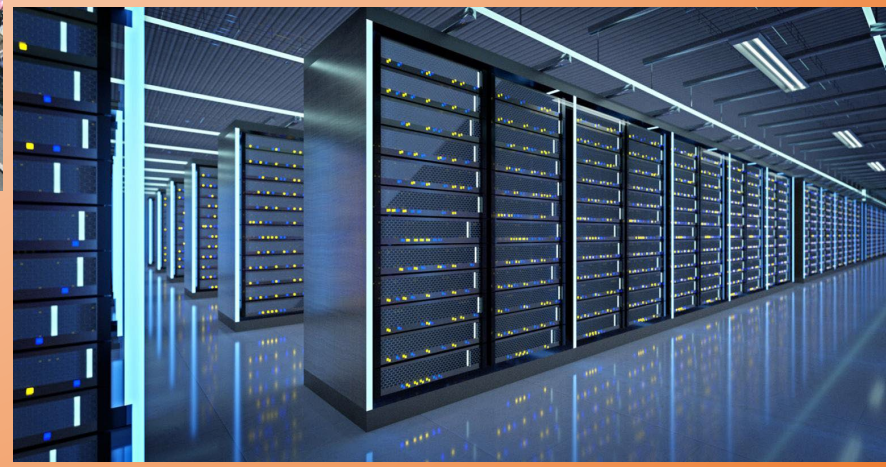
YOU

Don't you ever feel guilty?

After eating all those hamburgers,

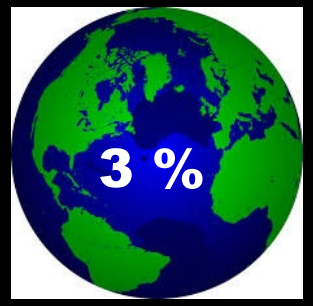
are you really innocent in this data increase, too?





Hyperscale Data Centers

The carbon emissions of data centers =



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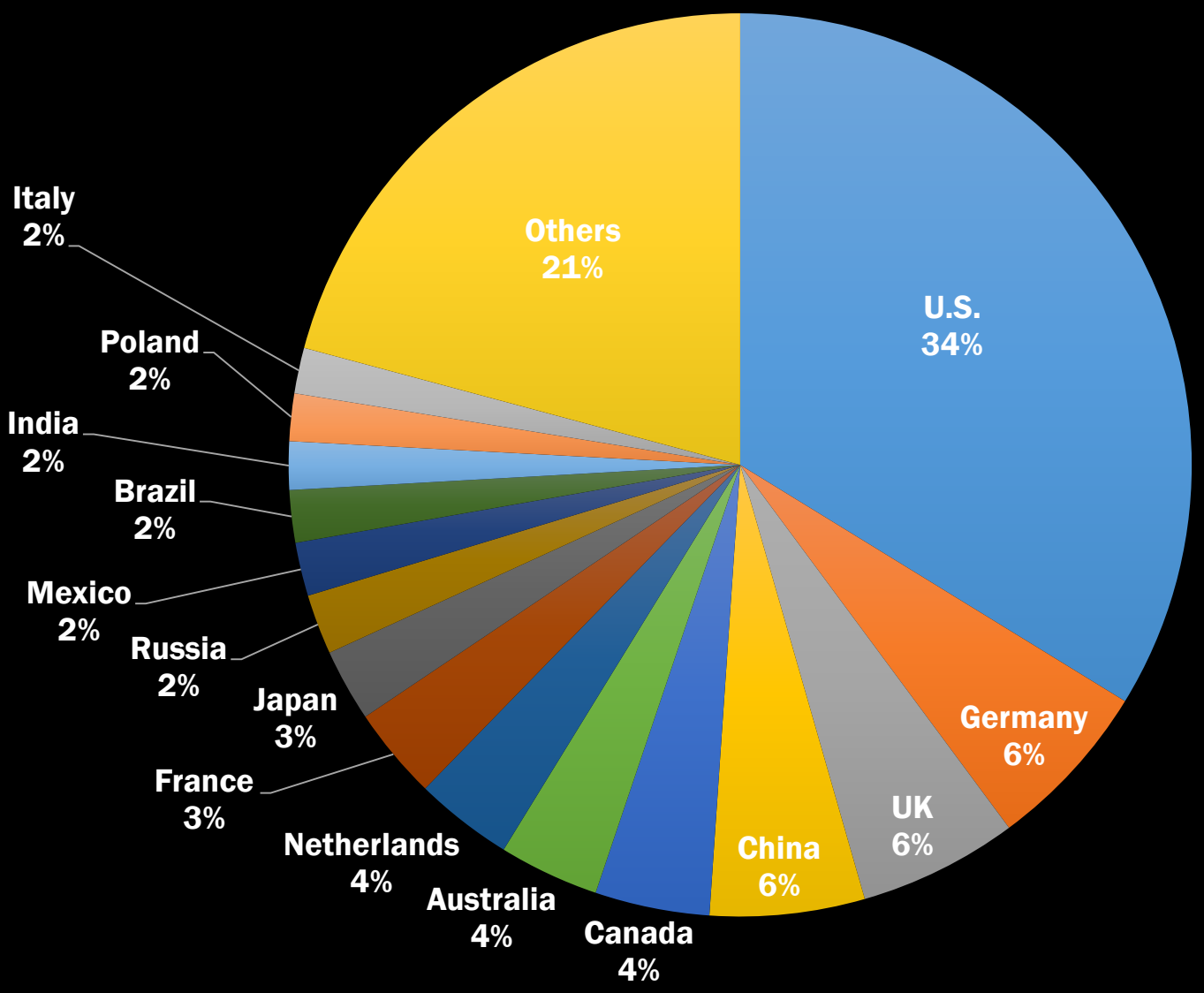
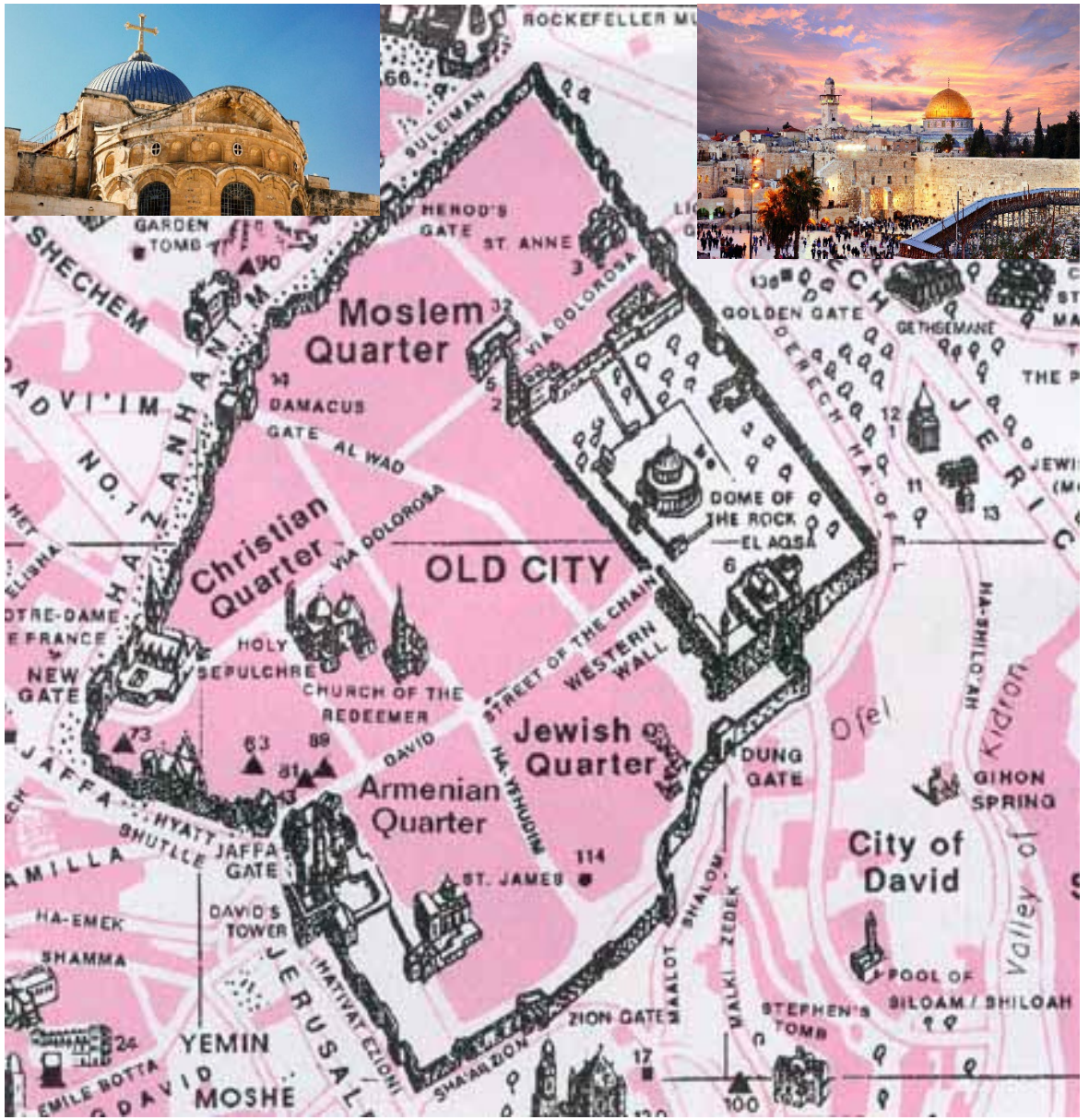
Number of Data Centers Worldwide 2022



Country	Number
U.S.	2701
Germany	487
UK	456
China	443
Canada	328
Australia	287
Netherlands	281
France	264
Japan	207
Russia	172
Mexico	153
Brazil	150
India	138
Poland	136
Italy	131
Others	1666
Total	8000



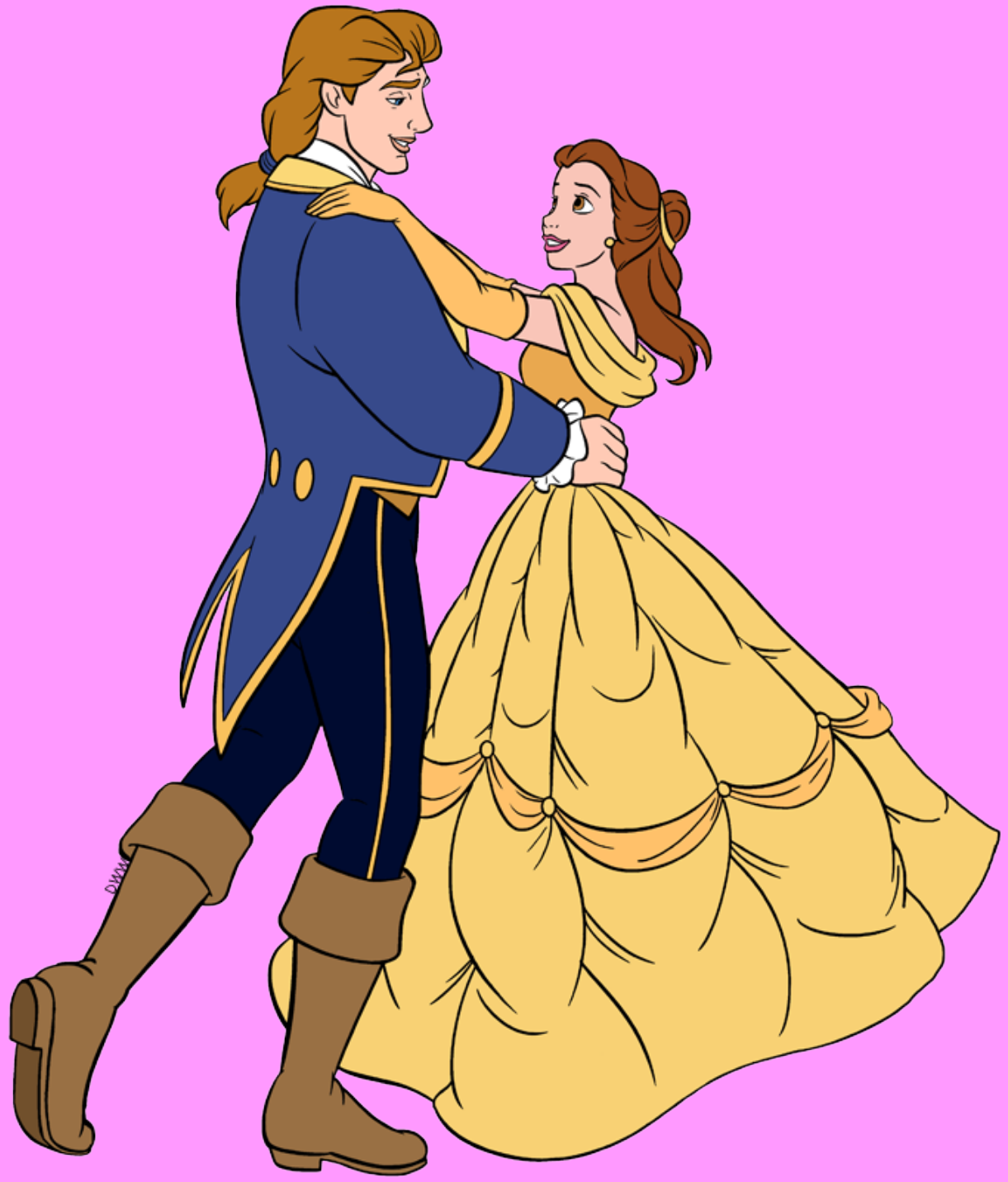
China Telecom – Hohhot Data Center

In 2021, the energy consumption of data centers in Germany was 3.32% of the total energy consumption.

In 2021, the energy consumption of data centers in Ireland was 14% of the total energy consumption.

IN TIMES OF CRISIS,
INNOVATION ONLY CREATES HEROES.

BEFORE THE WIND STOPS BLOWING,
THE SUN STOPS SHINING,
AND RIVERS STOP FLOWING,
DISASTER PLANNING IS DONE
AT THE RIGHT TIME,
IN THE RIGHT PLACE
AND BY THE RIGHT PEOPLE.



Hochschule Bielefeld
University of Applied Sciences and Arts

BiCAB
Bielefeld International Conference on Applied Business

PERMISSION TO CHANGE: UNDERSTANDING SUSTAINABLE HRM AS DYNAMIC CAPABILITY. HOW MIELE ENABLES SHOP FLOOR LEADERS TO ADVANCE THEIR ROLE CONTINUOUSLY

Dorothee Wilm, HSBI; **Bernd Respondek** and **Nicola Bergmann**, Miele & Cie. KG

12:10-12:30 Uhr

HSBI

Hochschule Bielefeld
University of Applied Sciences and Arts

Permission to change: Understanding Sustainable HRM as dynamic capability.

How MIELE enables shop floor leaders to advance their role continuously.

Bielefeld International Conference on Applied Business
- Sustainability innovations in times of crisis -

Dr. Dorothee Wilm | Nicola Bergmann | Bernd Respondek

Miele

BiCAB
Bielefeld International Conference on Applied Business

THE RESEARCH PROJECT

Dr. Dorothee Wilm
University of Applied Sciences and Arts, Faculty of Business

Nicola Bergmann
Head of Human Resources Development, Miele (Bielefeld)

Bernd Respondek
Director of Miele Production System (until Dec 2021)

- Super interesting project
- Action research
- New insights and perspectives
- A step towards people sustainability

The Case → The Theory → Practical Implications → Theoretical Implications → Take Aways

Hochschule Bielefeld
University of Applied Sciences and Arts

THE CASE

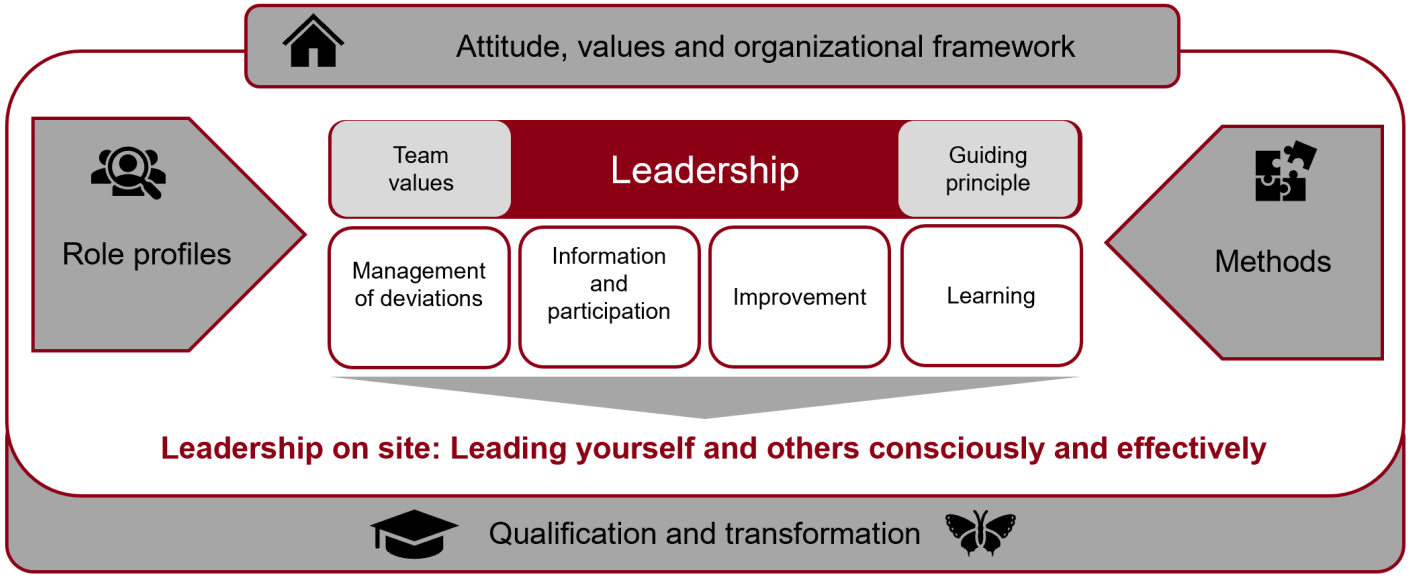
A new understanding of shopfloor leadership at MIELE

SITUATION FACED

- General background: Progressing globalization, digitization, and demographic change
- Changed expectations of employees
  - Appreciation
  - Participation
  - Open conflict culture
- Intense competitive pressure → strong pressure to increase production efficiency
- High stress on shopfloor leaders and employees
- Dissonance between the two groups
- Existing measures were not sufficiently integrated
- One visible indicator: increasing absenteeism rates

ACTIONS TAKEN – THE FRAMEWORK

- In 2020 the project "understanding of shopfloor leadership" was initiated.
- Goal: Describe an under-standing of leadership that
  - builds upon the existing experience and expertise,
  - ensures sustainability,
  - is open to the integration of future requirements.



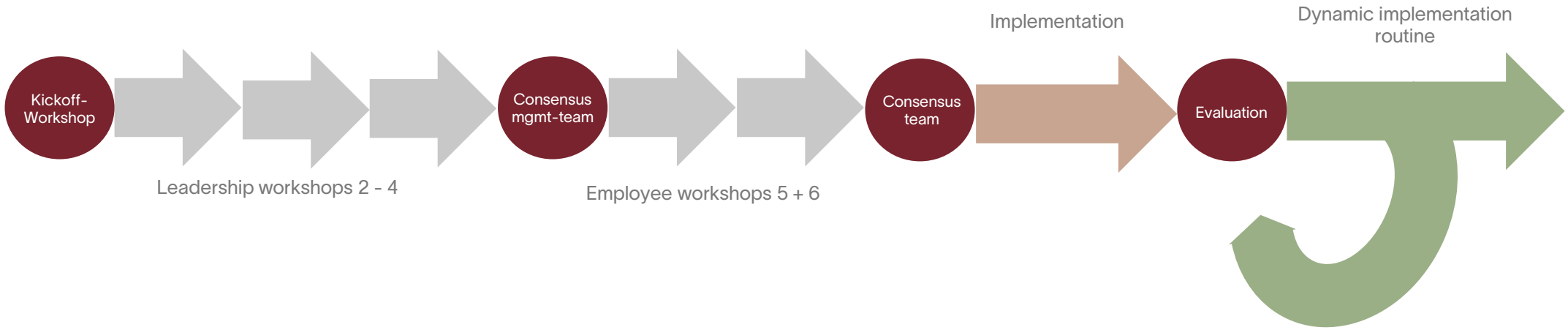
In the MWS Leadership Framework, a wide range of activities find a flexible regulatory framework that integrates existing concepts and procedures.

Miele

BiCAB Bielefeld International Conference on Applied Business

ACTIONS TAKEN – THE PROCESS

- All shopfloor leaders are included in the workshop sequence.
- Employees are represented by voluntary representatives.
- Elaboration and agreement on the elements of the Leadership Framework.



TODAYS CHALLENGE: SUSTAINABILITY

Lessons learned

- Each process takes several month
  - Functioning project team
  - Participation of the works council
  - Conscious stakeholder management
- Appreciation of the courage of the leaders; Enablement of personal reflection
- Participation is much appreciated and perceived as “new”
- Skepticism regarding the binding nature of the implementation

The current challenge of the change project is twofold

Sustainable implementation of the developed future state of leadership.

&

Build competences that enable the continuous adjustment of shopfloor leadership.

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THE THEORY

Sustainable HRM as dynamic capability

RESOURCES AND COMPETENCES

- The resource-based view (RBV): competitive advantages depend on the organizational resources and competences.
  - Financial, physical, human and organizational resources with certain qualities
  - Organizational competencies – the daily work practices – that select and combine the different resources and contribute to the achievement of the corporate goals.

→ Shopfloor leadership as organizational competence.

- In our VUCA world static resource sets and stable competencies are not sufficient. Companies need dynamic capabilities – a general ability to learn and innovate its resources and competences – to remain successful.
  - Dynamic capabilities integrated into other competences (e.g. Teece et al., 1997)
  - Dynamic capabilities as meta-competence (e.g. Zollo/Winter, 2002)

→ Proposition: Sustainable HRM is a dynamic capability.

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SUSTAINABLE HRM AS DYNAMIC CAPABILITY

- What is Sustainable HRM?
  - Balance two contradictory rationalities: efficiency and substance preservation.
  - Fine line between win-win and lose-lose.

- Shopfloor leadership and the change project as examples of sustainable HRM
  - Shopfloor leaders balance both economic rationalities within their daily work and generate win-win-situations.
  - The attainments of the project enable them to participate and make authentic decisions on how they provide their workforce.

- How is that a dynamic capability?
  - Organizational competencies are per se “in motion” (evolutionary development)
  - Employees are key agents of organizational learning processes.
  - The performance of sustainable HRM strengthens organizational learning processes within the evolutionary development of organizational competences.

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PRACTICAL IMPLICATIONS

Shopfloor leaders need a permission to advance their role continuously

PRACTICAL IMPLICATIONS FROM THE THEORETICAL PERSPECTIVE

- We gained understanding and vocabulary for something that was anticipated but not articulated: the win-win of sustainable HRM.
- The MWS methods as vehicles that transport the reconfigured resources into the daily work. Methods are helpful if they incorporate the authentic values and needs of the leaders.
- Shopfloor leadership is a dynamic process:
  - It is necessary to create regular reflection and engagement for shopfloor leaders
  - A permission to change is needed because of changes in environmental conditions or of the individual resources and needs of employees.
- The attainment of the change project needs to be stabilized as organizational competence
  - Within the shopfloor: Use the MWS methods to monitor the leaders' actual needs
  - At a metalevel: institutionalized project team, yearly evaluation, alignment with strategy

Sustainable HRM as precondition for sustainable change and a promotor for continuous organizational learning.

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THEORETICAL IMPLICATIONS

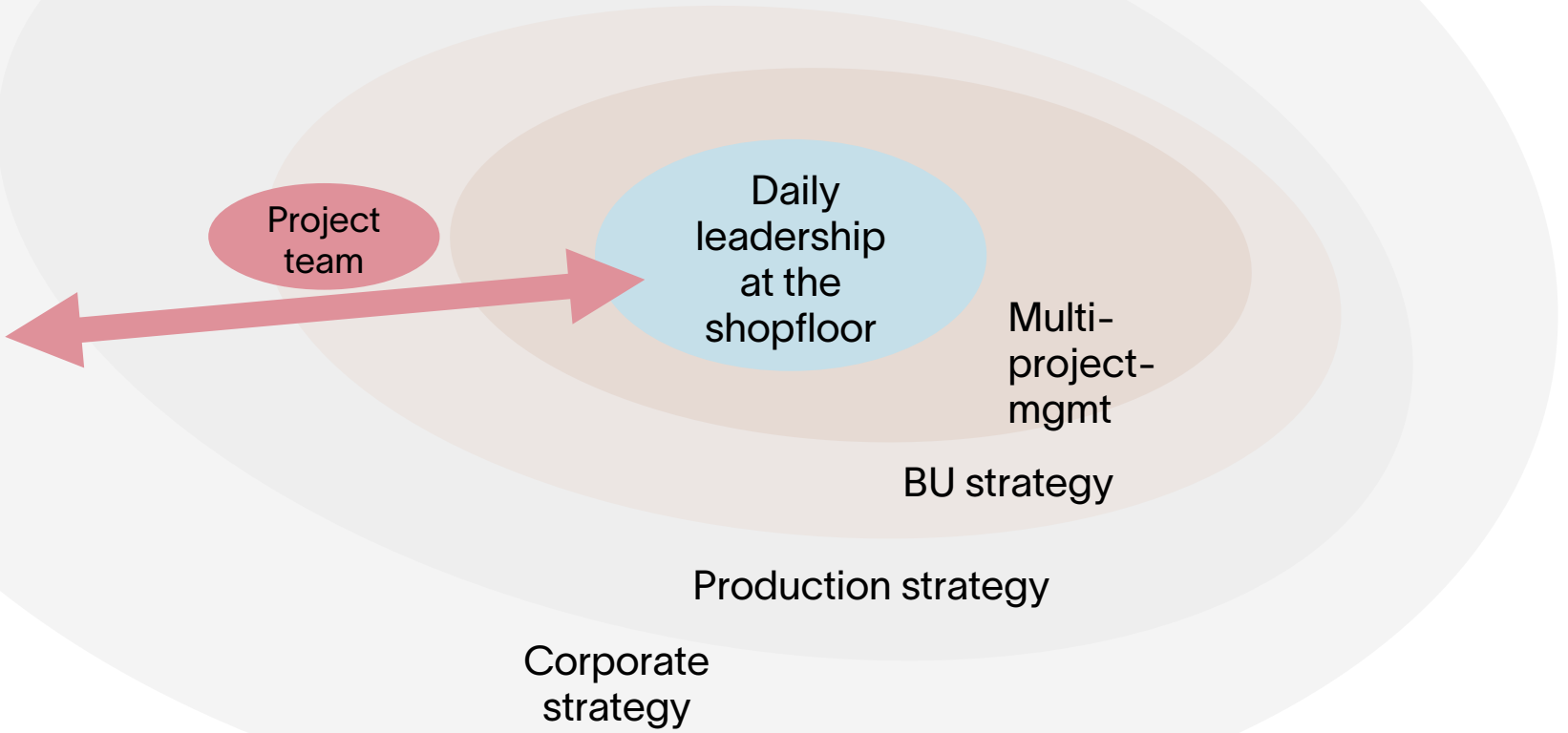
A dynamic capability shell model

THEORETICAL IMPLICATIONS FROM THE PRACTICAL PERSPECTIVE

- The performance of sustainable HRM happens in a multitude of different operations.
- A monitoring of the actual practices is needed in addition to the participatory instruments (e.g. integrate KPIs that track the appliance of the MWS methods in the layered process audit).
- Focus on methods to specify how individual and organizational resources are selected and put into practice.
- A dynamic capability shell model.

THEORETICAL IMPLICATIONS FROM THE PRACTICAL PERSPECTIVE

A dynamic capability shell model



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TAKE AWAYS

“Always better”

TAKE AWAYS

- The potential win-win of Sustainable HRM realizes in the day-to-day practices – at the shopfloor and in any other units of the organization.
- The change project is a great example of and a contribution to People Sustainability at MIELE – it gets to the heart of MIELEs motto “always better”.
- The close collaboration of practice and science is very helpful to create sustainability innovations – our research project is mutual valuable and will be continued.

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THANK YOU!

We look forward to your questions.

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PROCESS MINING FOR INNOVATING LIVESTOCK FARMING: A STEP FORWARD TOWARDS SUSTAINABILITY

Serena Racis and **Alessandro Spano**, University of Cagliari, Italy; **Jochen Küster**, HSBI

12:30-12:50 Uhr

Process Mining for Innovating Livestock Farming: a Step forward towards Sustainability

HSBI Hochschule Bielefeld University of Applied Sciences and Arts

BiCAB Bielefeld International Conference on Applied Business

Ph.D. student Serena Racis
Prof. A. Spano, Prof. J. Kuester

Table of Contents

Introduction

- Public and private organizations worldwide are facing unprecedented and continuous challenges
- **Climate change** is probably the most critical threat to overcome (Fuelner, 2017)
  - huge repercussions on many sectors, countries, and generations
  - strong interconnections with other global challenges
- Global population is expected to increase from 7.3 billion people up to 9.7 billion in 2050, and to 10.4 billion in 2100 (United Nations, 2022)
- The demand for animal products will increase as well
  - the livestock sector must be able to satisfy both **demand** and **sustainability** issues

Introduction

- The livestock sector is one of the **most pollutant** ones:
  - 14.5% of global greenhouse gas emissions (World Bank, 2022)
  - extensive use of cultivable land and available water (FAO, 2006)

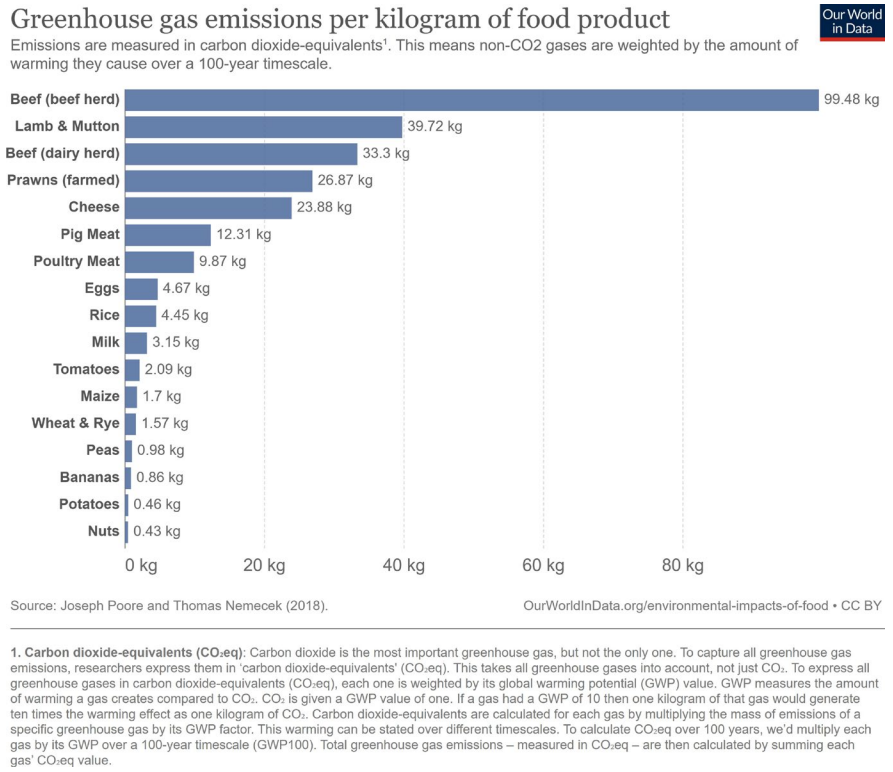


Figure: Food footprints (Our World in Data)

Introduction

- Necessity to adopt proper policies and strategies for the **sustainable development** of present and future generations
  - **innovative technologies**, institutional arrangements, cultural frameworks (Beddoe et al., 2009)
  - individual actions (Fuelner, 2017)
- The adoption of technological improvements and digitalization in the livestock sector could help make farming processes more efficient and sustainable
  - positive impacts on **human**, **animal**, and **environmental health**

Precision Livestock Farming technologies

- **Precision Livestock Farming** (PLF) technologies provide farmers with **objective**, **constant**, and **real-time** information on animals' conditions and welfare, thanks to digital livestock management and monitoring systems (Norton et al., 2019)
  - identify individual animals' needs
  - more effective use of resources (food, water, power supply)
  - timely detection of diseases or other problems (Neethirajan et al., 2018)

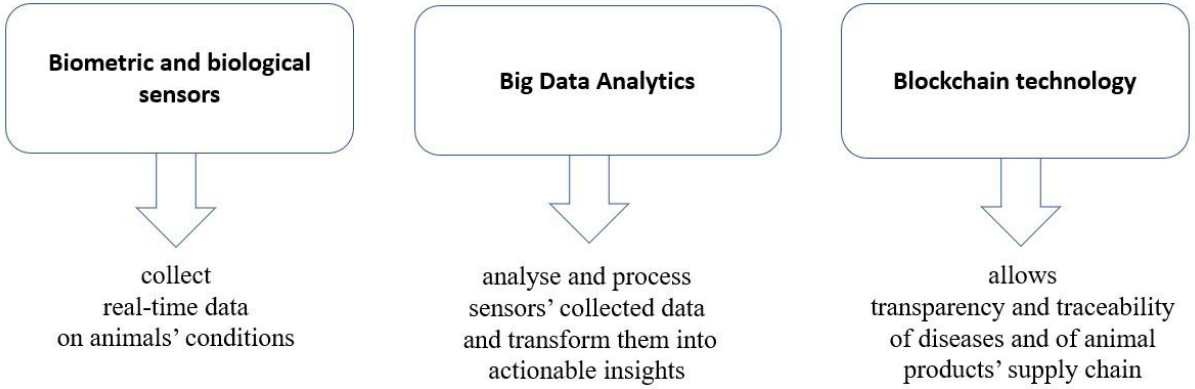


Figure: Precision Livestock Farming technologies (adapted from Neethirajan & Kemp, 2021)

Process Mining

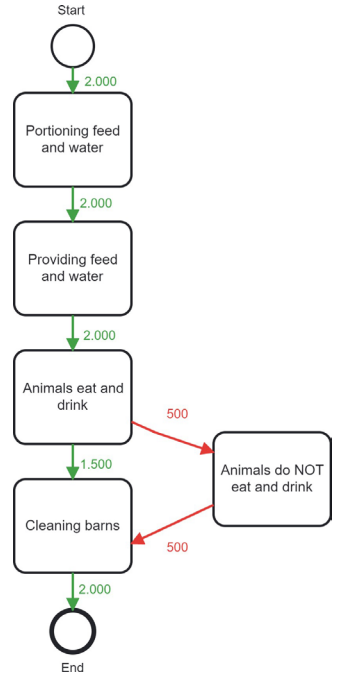
back

- **Process mining** uses tools and techniques to **extract** data and information on business processes directly and in an automated manner from **event logs** present in organizations' Information Systems (van der Aalst et al., 2007)

Case ID	Activity	Time	....
1001	Portioning feed and water	01-01-2020, 6:30 am	...
1001	Providing feed and water	01-01-2020, 7:00 am	...
1001	Animals eat and drink	01-01-2020, 7:30 am	...
1002	Portioning feed and water	01-01-2020, 03:00 pm	...
1002	Providing feed and water	01-01-2020, 03:30 pm	...
1002	Cleaning barns	01-01-2020, 05:00 pm	...
1003	Portioning feed and water	01-01-2020, 02:00 pm	...
...	...	...	...
1009	Animals do not eat and drink	02-01-2020, 7:30 am	...
1009	Cleaning barns	02-01-2020, 05:00 pm	...
...	...	...	....

Event
Trace
Activity name
Timestamp
Other data

Event log's elements



Discovered Process

Figure: Feeding process

Process Mining

- Process Mining allows to **discover**, **monitor**, and **improve** actual process performance by using both **computational intelligence** and **data mining**, and **process modeling** and **analysis** (van der Aalst et al., 2012)
- **Backward-looking** and **forward-looking** analyses (van der Aalst et al., 2022)
  - identification of bottlenecks and inefficiencies that can lead to major waste of resources (Erdogan & Tarhan, 2018)
  - better allocation of tasks, activities, and resources (Schreiber, 2020)
  - automation of some steps (Zerbino et al., 2021)
- Processes optimization and re-engineering
- Higher process efficiency and **reduction of waste**

Aim of the study & Methodology

- The aim of this study is to shed light on the use of **Process Mining** to achieve **higher sustainability levels** in the **livestock farming sector**

1. Two systematic literature reviews:
   - Process Mining use to achieve sustainability goals
   - Process Mining use in the livestock farming sector
2. Development of a framework that integrates Process Mining with PLF technologies

Findings Systematic Literature Review 1

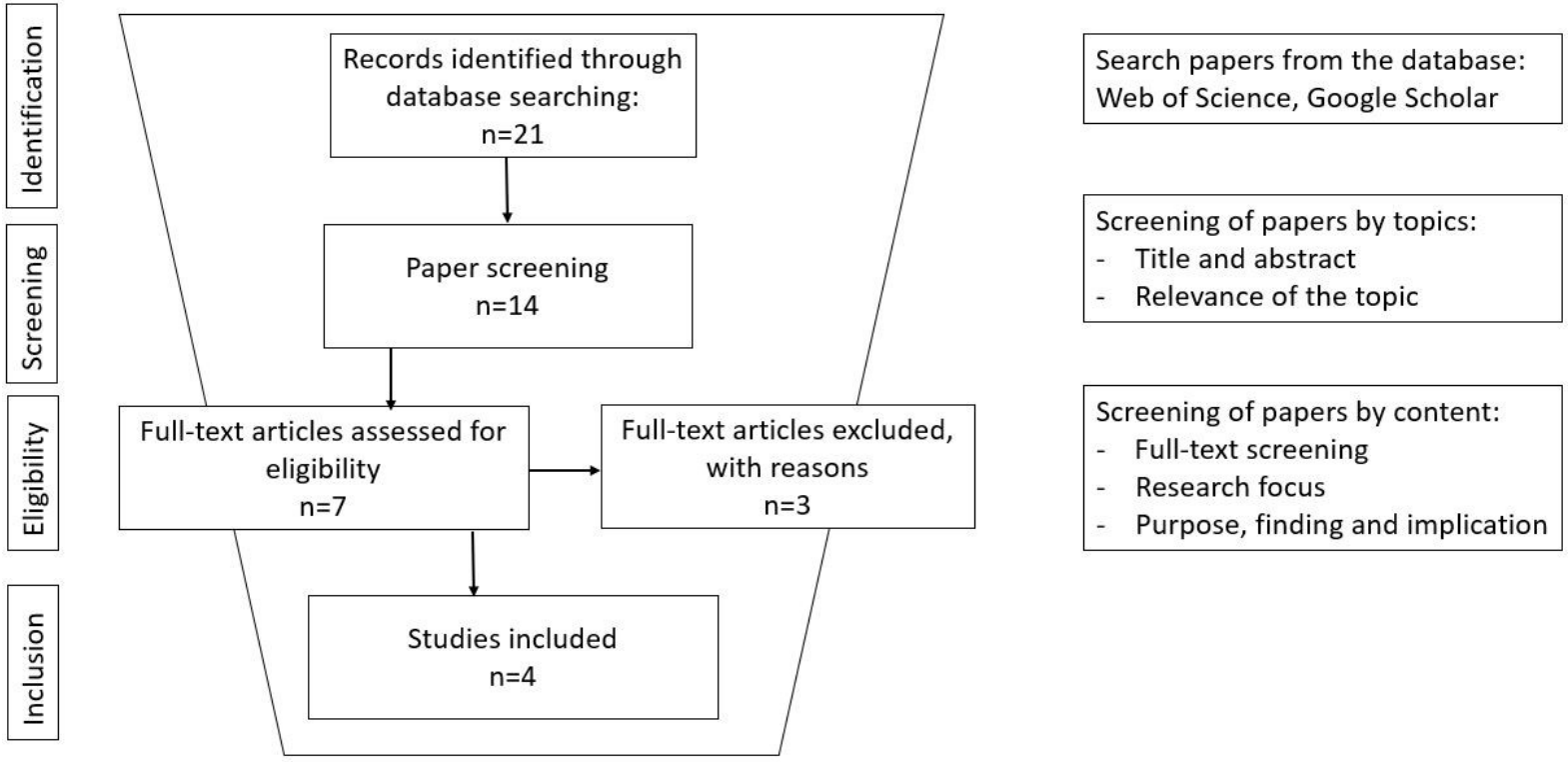


Figure: Process Mining use to achieve sustainability goals

Findings Systematic Literature Review 2

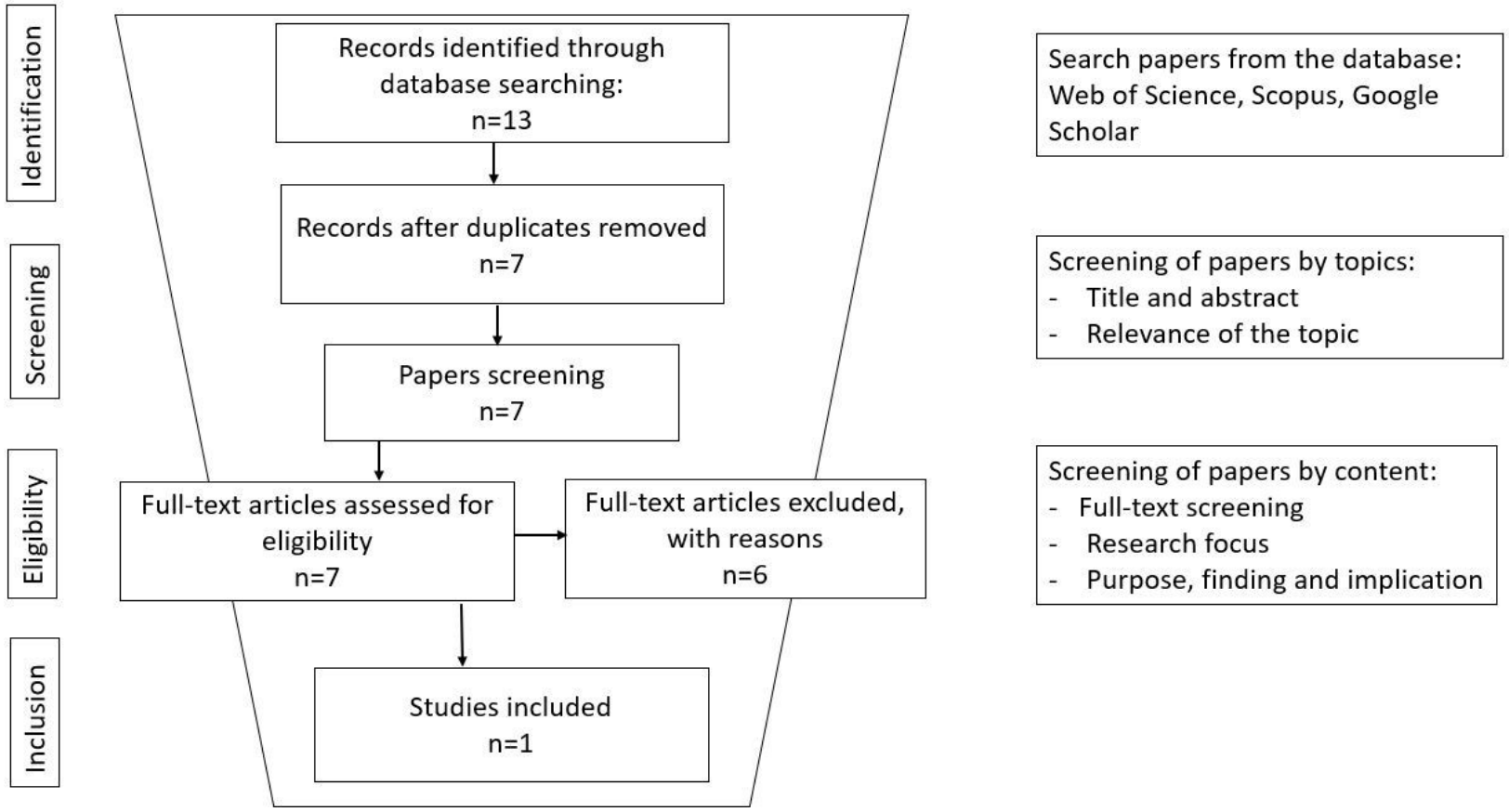


Figure: Process Mining use in the livestock farming sector

Findings Integrative framework

- Both Process Mining and PLF technologies require efficient **Information Systems** and **high-quality data**
- PLF technologies provide objective and reliable information on animals' conditions in real-time thanks to **Big Data analytics** and **machine learning**
  - better management of animals and resources
- Process Mining can integrate PLF technologies from a **process perspective**
  - insights on process performance and anomalies
  - suggestions for process improvement and automation

PM

Findings Integrative framework

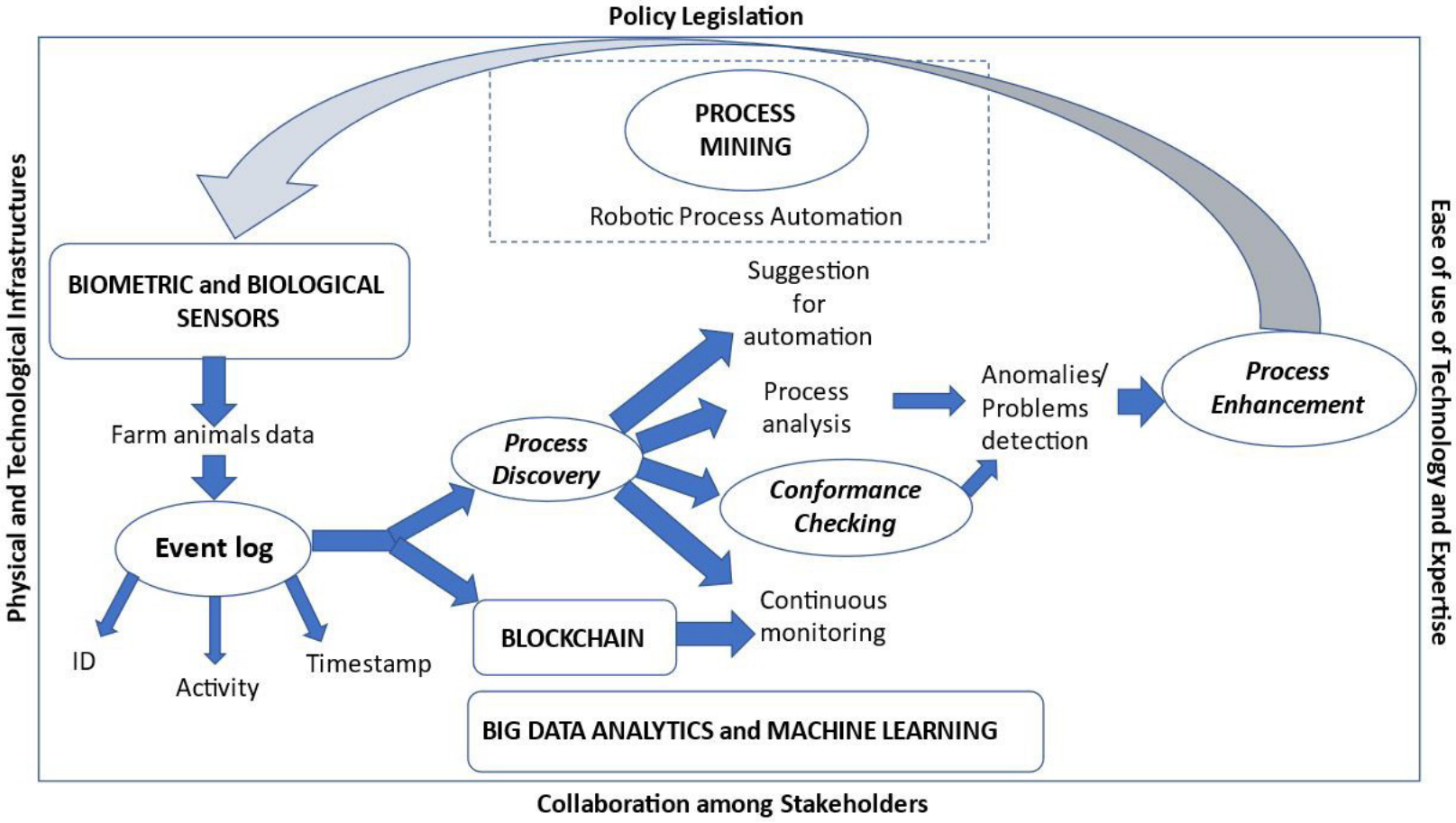


Figure: Process Mining and PLF technologies integrative framework

Findings Integrative framework

Process transparency and **supply-chain traceability** thanks to Process Mining and blockchain combination

- monitoring and tracking diseases
- preventing transmission and contagion
- greater awareness for consumers
- detection of animal products waste

Figure: Emissions from food never eaten (Our World in Data)

Discussion

Process Mining **integration** with Precision Livestock Farming technologies:

- more efficient and transparent farming processes
- insights for less pollutant processes
- potential for automation
- improved environmental conditions and animals' treatment
- higher working quality inside farms
- more satisfied consumers

Discussion

- Global population will continue to grow, especially in developing countries
  - Problems related to migration, job occupation, climate change, and scarcity of resources
- Still **many barriers** to technologies' adoption in the livestock farming sector:
  - Inadequate physical and technological infrastructures (Koltes et al., 2019)
  - Lack of regulations and governments support (Sarker et al., 2020)
  - Scarce collaboration among farmers and stakeholders (Banhazi et al., 2012)
  - Hard to choose the most appropriate tools and software (Papst et al., 2019)
  - Hard to monetize new technologies investments (Banhazi et al., 2012)
  - Farmers fear of being replaced by more technologically skilled workers, algorithms, or machines (Klerkx et al., 2019)
  - Farmers lack of technological skills and expertise (Eastwood et al., 2019)
  - Data-privacy and security issues (Wolfert et al., 2017)

Conclusions

- The integration of **Process Mining** and **PLF** technologies in the livestock farming sector could make farming processes **more efficient**, **sustainable**, and **respectful of animal welfare**
  - satisfying the increasing demand for animal products
  - caring of animal conditions and pollutant emissions
  - accelerating the digital and environmental transition towards a more sustainable and environmental-friendly way of farming
- PLF technologies are already in use in the livestock farming sector, Process Mining is not
- **Close collaboration** among farmers, engineers, and process mining experts is fundamental to integrate Process Mining and PLF technologies to make farming processes **more sustainable**, **safe**, and **profitable**

Thank you

Thank you
for your attention

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LUNCH BREAK

12:50-13:40 Uhr

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SESSION 2 CHAIR: PROF. DR. HALDUN AKPINAR

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NUDGING CUSTOMERS TO REDUCE PACKAGING WASTE AND RECYCLE IN THE FOODSERVICE INDUSTRY

Eliza Starke, Lisa Rütgers, Chiara Winkelmann, Laura Gdanitz and **Manuel Stegemann**, HSBI

13:40-14:00 Uhr

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NUDGING CUSTOMERS TO REDUCE PACKAGING WASTE AND RECYCLE IN THE FOODSERVICE INDUSTRY

Eliza Starke, Lisa Rütgers, Chiara Winkelmann, Laura Gdanitz and Manuel Stegemann

12.05.23

770 tonnes

of take-away-waste in Germany daily

Source: Die Bundesregierung (2022).

"MEHRWEGPFLICHTENGESETZ" – 1ST JANUARY 2023 REUSABLE PACKAGING LAW FOR GERMAN GASTRONOMY

- Aim: **Reducing take-away waste**
- Obligatory for food service providers to offer their customers the option of **reusable packaging** or filling of brought cans or cups
- Only exceptions for smaller businesses:
  - Employees: < 5 or
  - Store area: < 80 square meters

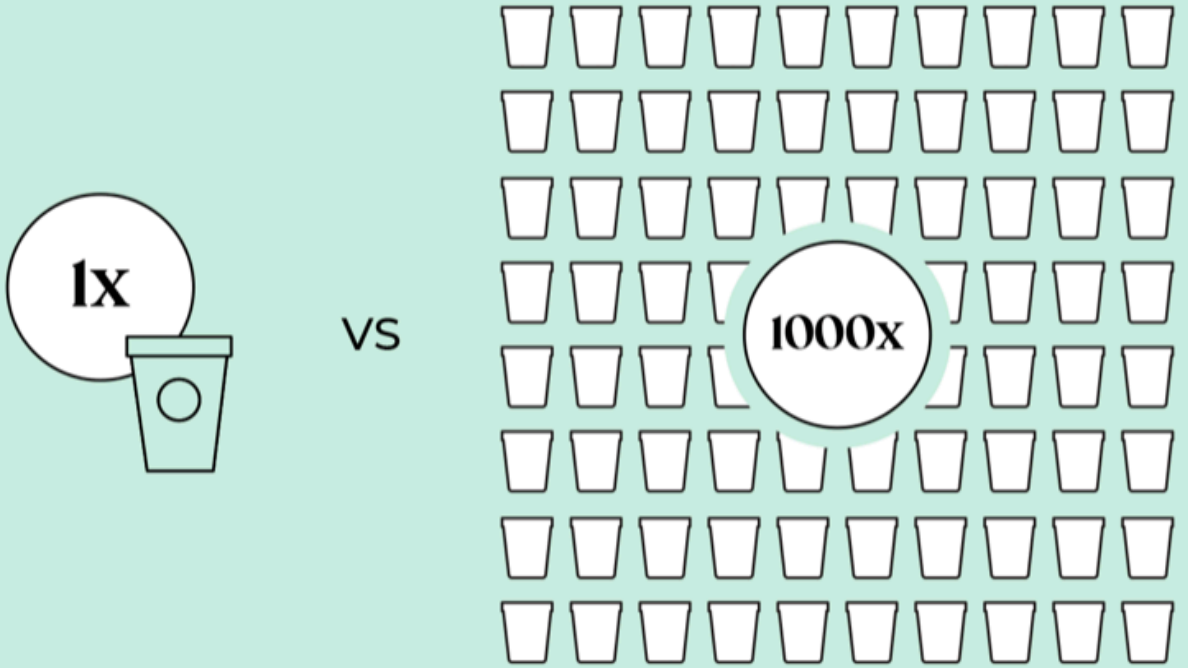


Image: RECUP (2023).

Source: Die Bundesregierung (2022).

IMPACT ON SUSTAINABLE CONSUMPTION?

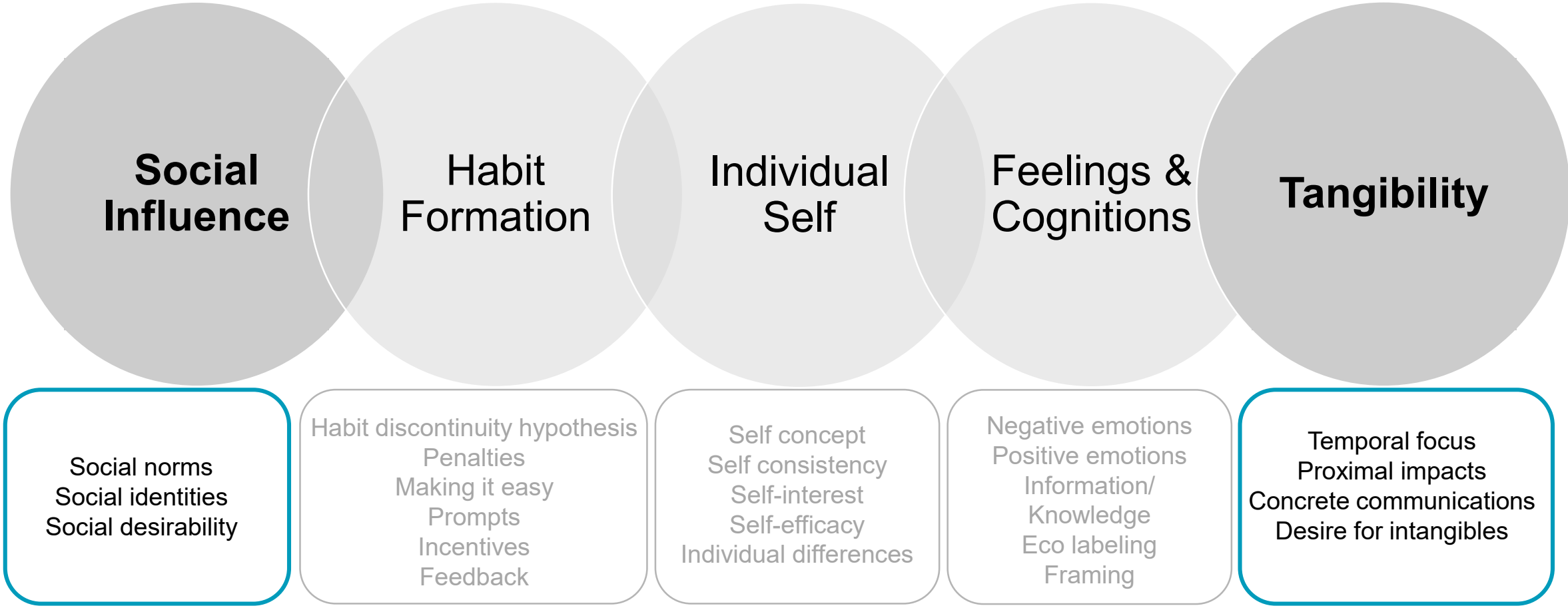
+ Customers get a **simple additional choice alternative**

- People are **trapped in behavior patterns and habits**

How to break habits and encourage consumption of reusable alternatives?

Image: RECUP (2023).

SHIFT MARKETING FRAMEWORK



Source: White et al. (2019).

PRE-STUDY: THREE NUDGES AS INDEPENDENT VARIABLE IN EXPERIMENTAL DESIGN

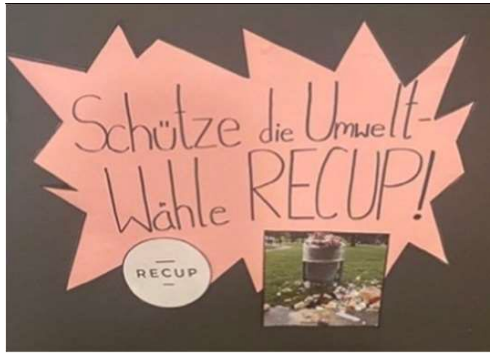
Social Proof:
70% of coffee lovers care about the environment through a reusable choice.

Appeal:
Save the environment! Choose RECUP!

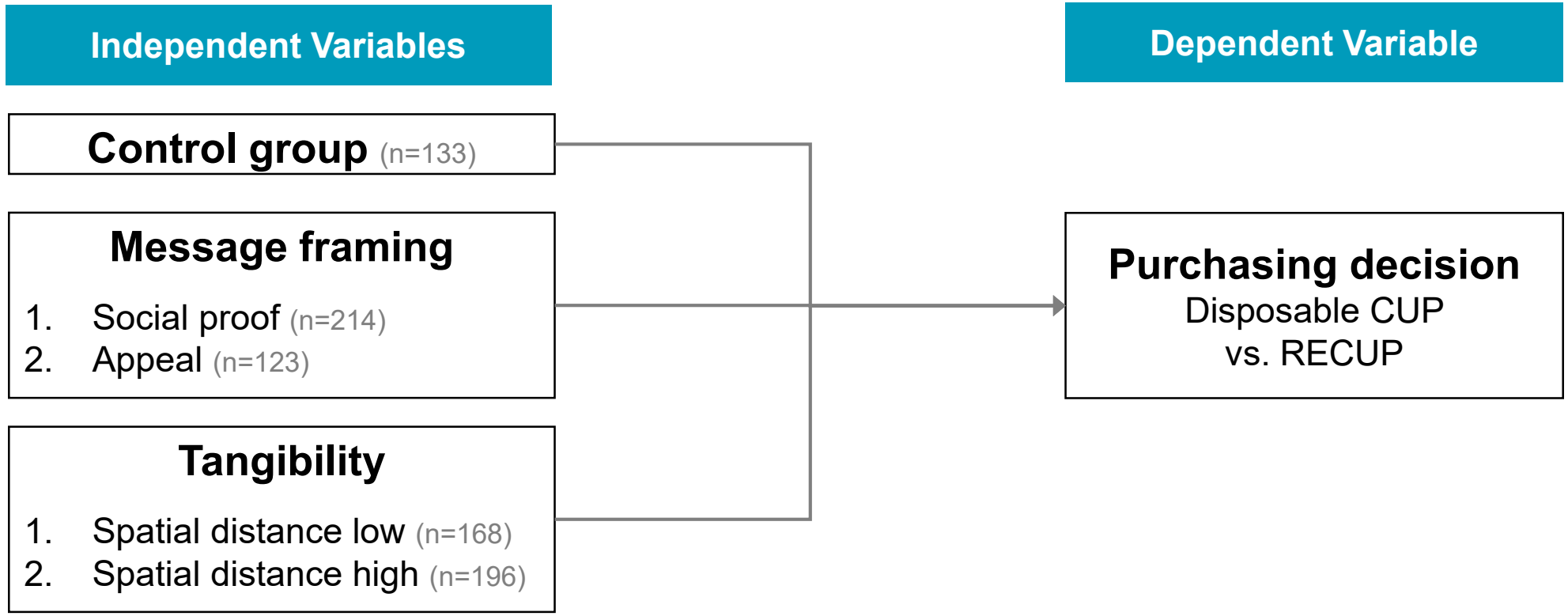
Tangibility:

Tangible: *Spatial distance low*

Intangible: *Spatial distance high*

	Social Proof	**Appeal**
Tangible		
Intangible		

PRE-STUDY OF GREEN NUDGES ON PURCHASING DECISION WITH 497 PARTICIPANTS



Source: White et al. (2019).

NONE OF THESE NUDGES HAS A STATISTICALLY SIGNIFICANT EFFECT ON THE PURCHASING DECISION

Stimuli	n	Disposable Cup	RECUP
Control group	133	133	**0**
Social Proof + Spatial distance high (intangible)	148	143	**5**
Social Proof + Spatial distance low (tangible)	93	90	**3**
Appeal + Spatial distance high (intangible)	48	46	**2**
Appeal + Spatial distance low (tangible)	75	73	**2**

CONCLUSION: CONSUMER BEHAVIOR MATTERS!

- The reusable packaging law alone **is not enough to encourage** the consumption of reusable alternatives and reduce packaging waste.
- Explanatory approaches are the existing **attitude-behavior-gap** and especially the **major barriers of the reusable alternative** (e. g. deposit systems).
- Future studies should focus **additional stimuli** and examine **their mediation effects** on bridging the attitude-behavior gap.
- It needs to be clarified whether consumer behavior can be controlled or whether the **law** needs to be adapted **to ban disposable packaging**.

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THE IMPACT OF CRITICAL FACTORS ON PURCHASE INTENTION TOWARDS ENVIRONMENTALLY SUSTAINABLE APPAREL: AN EMPIRICAL STUDY ON YOUNG TURKISH CONSUMERS

Ela Sibel Bayrak Meydanoğlu, Turkish-German University, Istanbul/Turkey; **Ahmet Mete Çilingirtürk**, Marmara University, Istanbul/Turkey; **Margareta Teodorescu**, Koblenz University of Applied Sciences; **Ferhat Sayın**, Turkish-German University, Istanbul/Turkey

14:00-14:20 Uhr

The Impact of Critical Factors on Purchase Intention towards Environmentally Sustainable Apparel: An Empirical Study on Young Turkish Consumers

Ela Sibel Bayrak Meydanoğlu, Turkish-German University, Istanbul
Ahmet Mete Çilingirtürk, Marmara University, Istanbul
Margareta Teodorescu, Koblenz University of Applied Sciences, Koblenz
Ferhat Sayın, Turkish-German University, Istanbul

BiCAB 2023, Bielefeld, 12th May 2023

Outline

1. Sustainability Issues in the Apparel Industry
2. Objective of the Study
3. Conceptual Model
4. Hypotheses
5. Method
6. Findings
7. Discussion & Conclusion

Sustainability Issues in the Apparel Industry

- Cotton and synthetic fibers are widely used materials in the apparel industry. They damage the environment in a number of ways
- Distribution of produced garments causes emission of greenhouse gases and exploitation of natural resources needed for transportation
- Textile and apparel waste is also an important environmental problem

Objective of the Study

- It is essential to identify and implement immediate solutions aimed at mitigating or eliminating the detrimental effects of the apparel industry on the environment. One of the solutions is to promote environmentally sustainable apparel and to persuade consumers towards this type of products

- There is a lack of previous studies in the research area of sustainable consumption attitudes and buying behavior in emerging markets

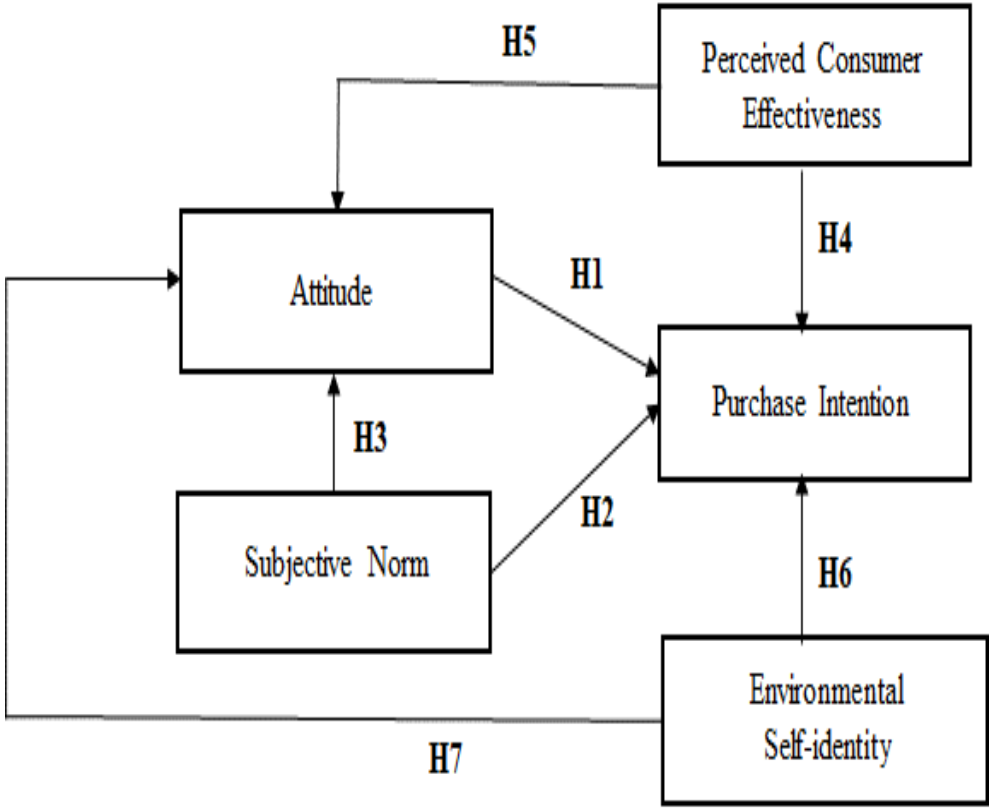
The study investigates the factors that affect the intention of

young Turkish consumers towards purchasing environmentally sustainable apparel

Conceptual Model

Consumer effectiveness is the extent to which individuals believe their actions can influence the outcome of a situation in a positive or negative way

Environmental self-identity is the extent to which individuals identify themselves with being environmentally conscious and view their actions as aligned with this identity



Hypotheses

H1: Positive attitudes of consumers towards environmentally sustainable apparel products positively affect their purchase intention towards these products.

H2: Subjective norms of consumers positively affect their purchase intentions towards environmentally sustainable apparel.

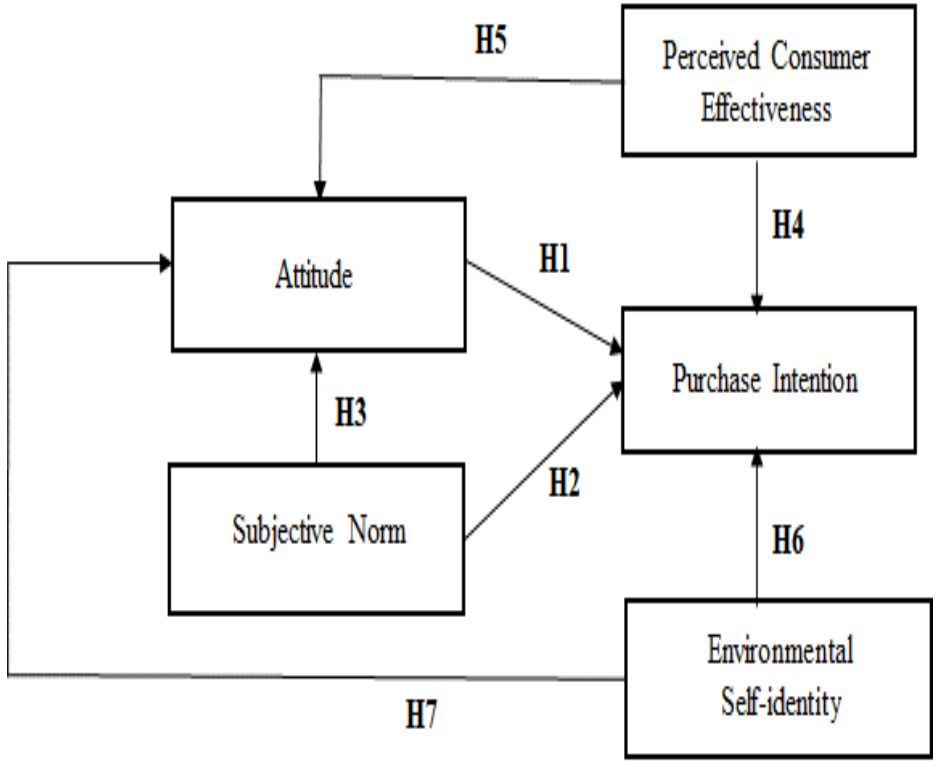
H3: Subjective norms of consumers positively affect their attitudes towards purchasing environmentally sustainable apparel.

H4: Perceived consumer effectiveness positively affects consumers' purchase intentions towards environmentally sustainable apparel.

H5: Perceived consumer effectiveness positively affects consumers' attitudes towards environmentally sustainable apparel.

H6: Environmental self-identity positively affects consumers' purchase intentions towards environmentally sustainable apparel.

H7: Environmental self-identity positively affects attitude towards environmentally sustainable apparel.



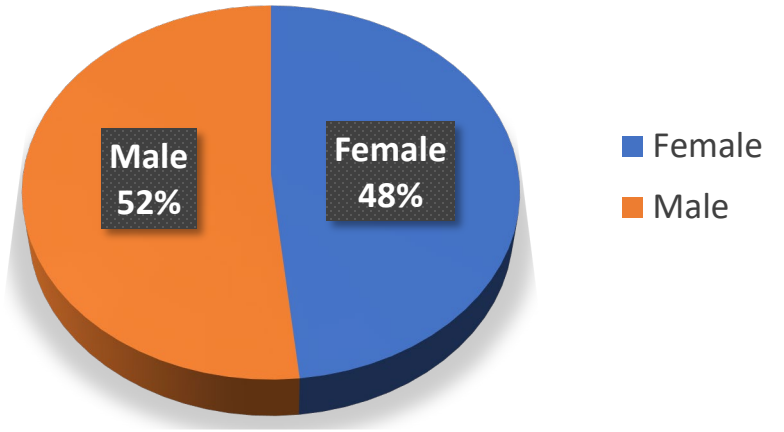
Method

- Data were collected with the help of an online questionnaire employed in January 2023 among students at a university in Istanbul
- The questionnaire consisted of two parts:
  - The first section comprised 17 questions that correspond to each construct within the proposed research model
  - The second section included demographics questions
- The data were analyzed using Stata15 software, and a structural model was estimated using the Stata SEM package

Method

Demographic characteristics of the sample

Demographic		Frequency	Percent (%)
Income Level (in TL)	2.500-5.000	33	6.90
	5.000-10.000	71	14.85
	10.000-15000	114	23.85
	15.000-20.000	87	18.20
	20.000-25.000	76	15.90
	25.000-30.000	97	20.29
Gender	Female	231	48.33
	Male	247	51.67
Sample Size (n)		478	



Findings – Measurement Model

Construct (Factor)	Coding	Mean	Std. Error	Factor Loading	Eigenvalue	α, CR, AVE
Attitude	AT	4.897	0.075	0.6475	2.1657	α = 0.819 CR = 0.826 AVE = 0.542
		5.866	0.065	0.6587		
		4.954	0.074	0.8304		
		4.828	0.076	0.7893		
Subjective Norm	SN	4.234	0.088	0.8773	2.3342	α = 0.842 CR = 0.857 AVE = 0.583
		4.115	0.084	0.9325		
		3.736	0.073	0.6574		
		3.805	0.074	0.5127		
Perceived Consumer Effectiveness	PCE	5.280	0.067	0.8191	1.5087	α = 0.719 CR = 0.721 AVE = 0.503
		5.017	0.074	0.7841		
		5.023	0.084	0.4722		
Environmental Self-Identity	ESI	5.584	0.062	0.8759	2.2055	α = 0.893 CR = 0.892 AVE = 0.735
		5.448	0.064	0.8413		
		5.301	0.074	0.8547		
Purchase Intention	PI	4.473	0.072	0.8300	1.8930	α = 0.839 CR = 0.834 AVE = 0.631
		4.870	0.075	0.7446		
		5.525	0.063	0.8060		

Findings – Structural Model Estimates

Effects	Path	Hypothesis	Std. Coef.	Std. Err.	z	Model Std. Coef.	Std. Err.	z	Sig.
Direct Effects	SN->AT	**H3**	0.2207	0.0282	7.81****	0.4204	**0.0600**	9.14	0.000
	ESI->AT	**H7**	0.4291	0.0485	8.84****	0.5626	**0.0493**	11.41	0.000
	PCE->AT	**H5**	0.2275	0.0453	5.03****	0.3156	**0.0609**	5.18	0.000
	AT->PI	**H1**	0.2973	0.0931	3.19***	0.2558	**0.0771**	3.32	0.001
	SN->PI	**H2**	0.1834	0.0341	5.37****	0.3007	**0.0548**	5.49	0.000
	PCE->PI	**H4**	0.1125	0.0497	2.26*	0.1342	**0.0611**	2.20	0.028
	ESI->PI	**H6**	0.4652	0.0638	7.29****	0.5248	**0.0639**	8.21	0.000
Indirect Effects	SN->PI		0.0656	0.0215	3.05***				
	ESI->PI		0.1276	0.0406	3.15***				
	PCE->PI		0.0676	0.0249	2.72**				
Total Effects	SN->PI		0.2490	0.0292	8.54****				
	ESI->PI		0.5928	0.0532	11.14****				
	PCE->PI		0.1801	0.0460	3.92****				

* Significant < 5%, ** significant < 1%, *** significant < 0.2%, **** significant < 5‰

Discussion & Conclusion

All the proposed hypotheses are empirically supported. This finding is in line with the previous studies mentioned in the study

Young Turkish consumers' intention to purchase environmentally sustainable apperal and the factors affecting this intention are not different from those of consumers in developed markets

Cultural and economic differences may not significantly affect Turkish consumers' purchasing behavior regarding environmental sustainability

Implications

- This study enriches the limited body of literature related to factors affecting consumers' purchase intention towards environmentally sustainable apparel products in emerging markets
- The study provides an insight for practitioners into the major factors to be considered when designing marketing strategies and campaigns as well as formulating communication strategies for promoting environmentally sustainable apparel for young consumers in Turkey

Limitations & Future Research Areas

- Due to time and budget constraints, a convenience sampling was used in this study, focusing only on young Turkish consumers. Future contributions can work with samples which enable to obtain results that can be generalized across Turkey and other generations as well

- The proposed research model may be extended with other factors such as “perceived behavioral control”

- Future studies may also focus on social dimensions of the sustainability, investigating the factors affecting consumers’ purchase intention towards socially sustainable apparel products

- Comparative studies between Turkey and other emerging markets or developed countries may be conducted

Thanks for your attention!

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SUSTAINABLE INFORMATION SECURITY

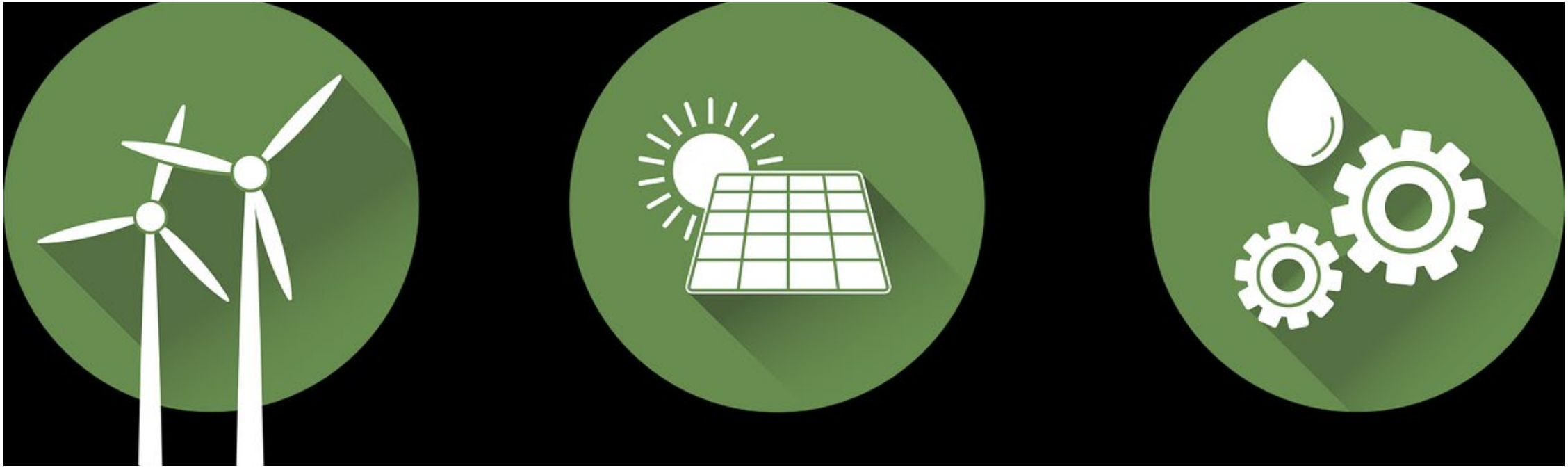
Achim Schmidtmann, HSBI

14:20-14:40 Uhr

HSBI

Hochschule Bielefeld

University of Applied Sciences and Arts



Sustainable Information Security

Prof. Dr. Achim Schmidtmann

17.05.2023

Central question:

Is information security sustainable?

And if so, to what extent?

WHY IS CYBERSECURITY IMPORTANT TO ESG FRAMEWORKS?

» While cybersecurity has mainly been viewed as a technology issue, it is now also regarded as a key environmental, social and governance (ESG) concern, falling under the “Social” pillar.«

Source: J.P. Morgan Global Research (2021)

» Cybersecurity is an environmental, social and governance issue«

Source: World Economic Forum (2022)

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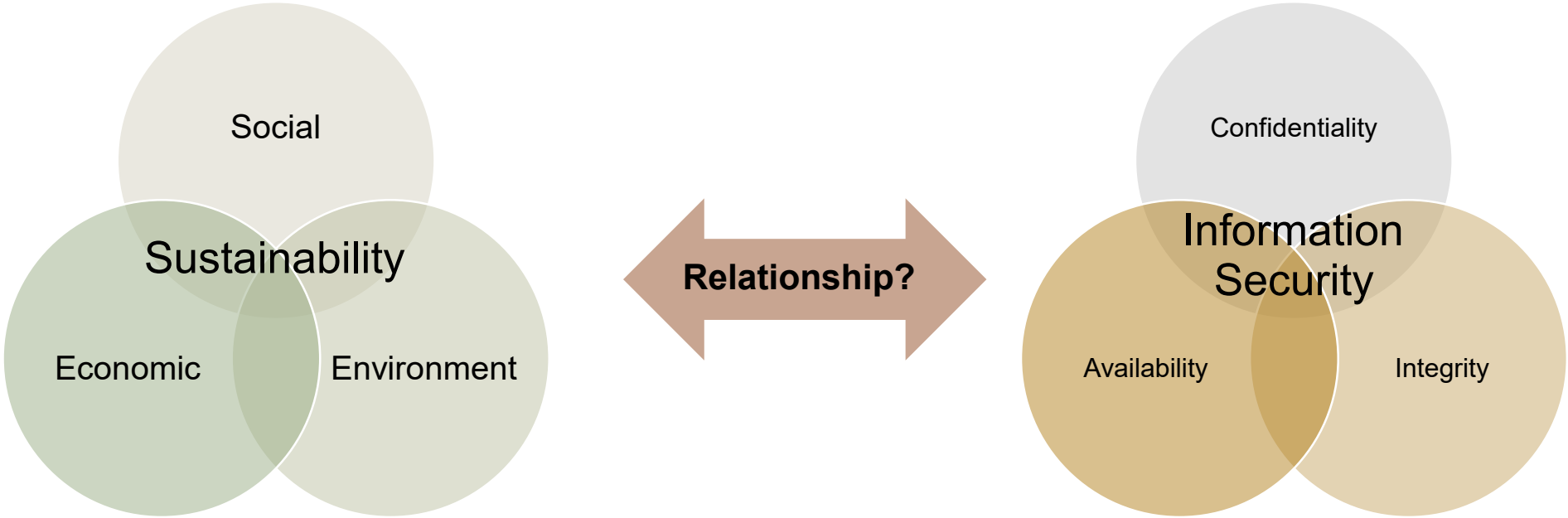
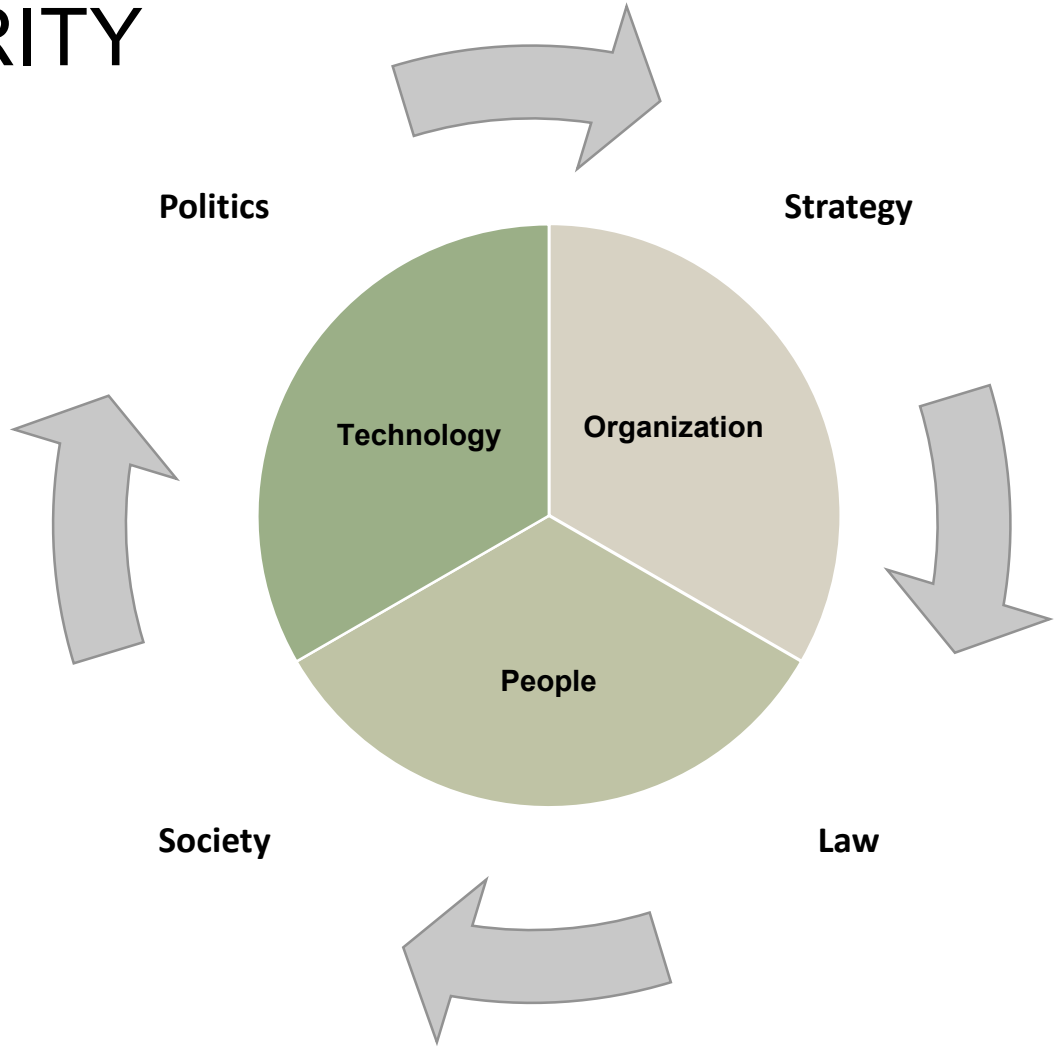
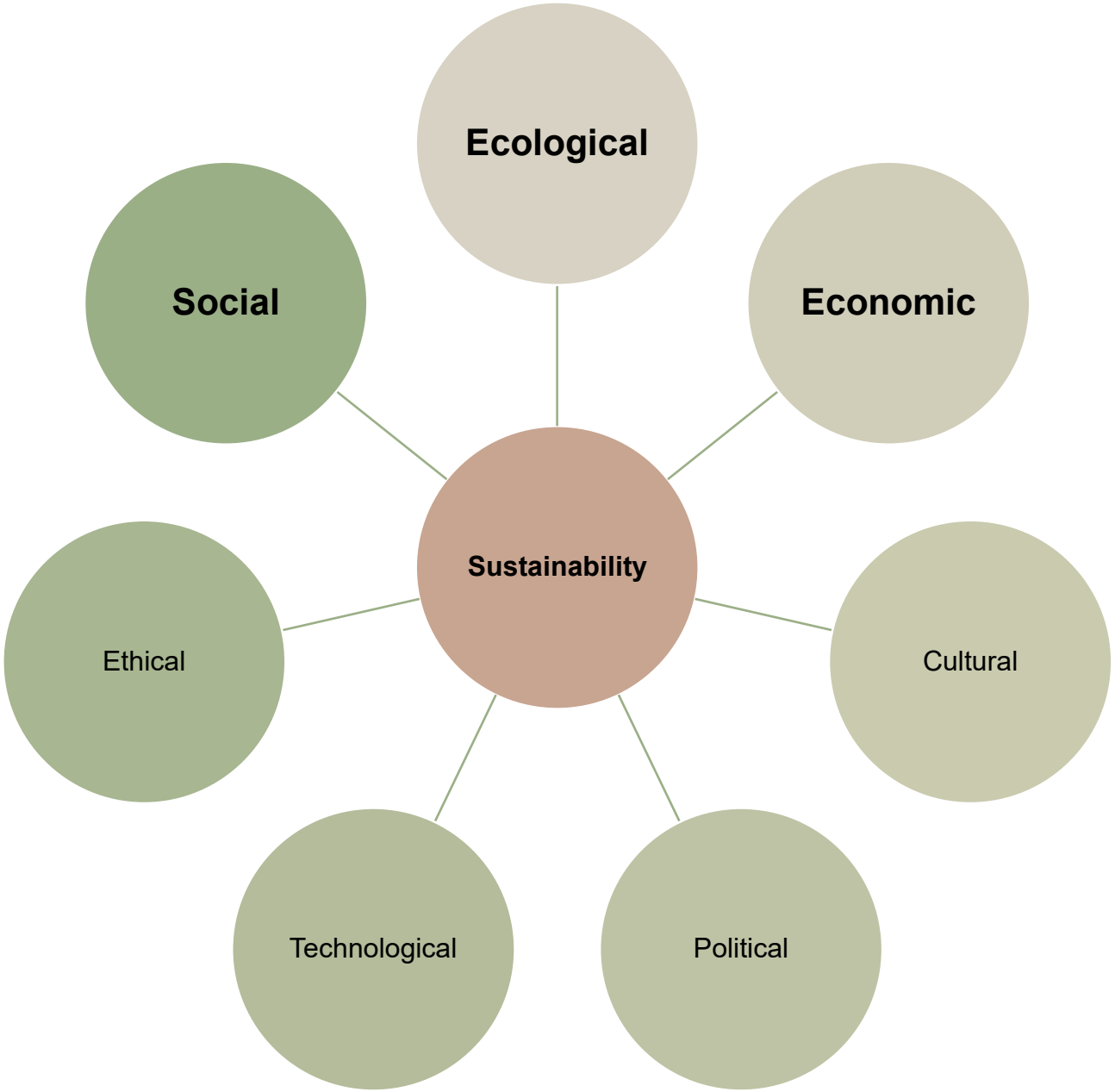
HIGHLY TOPICAL TRENDS AT THE BEGINNING OF THE 21ST CENTURY



INFORMATION SECURITY DIMENSIONS



SUSTAINABILITY



ECOLOGICAL SUSTAINABILITY

Pro

- digitalization helps to reduce waste and energy consumption and it requires increased information security
- information security protects information and data against loss or damage so to spend additional resources to recover it

Contra

- digitalization of processes or the use of digital technologies is a requirement for strong information security
- Information security measures also include the collection and processing of data which consumes resources

Ecological

ECOLOGICAL SUSTAINABILITY

Summary

- it is about **how to use IT**
- **efficiently and in an environmentally friendly manner** to promote sustainability.

- appropriate **security measures** reduce the number of successful attacks and minimize the overall energy consumption
- the **costs and resources required to defend** against cyber-attacks are generally **lower** than the costs and damage that can be caused by successful attacks

Ecological

ECONOMIC SUSTAINABILITY

Pro

- risk reduction
- trust and reputation
- regulatory requirements
- efficiency and productivity

Contra

- short-term costs **but** long-term economic success by avoiding costs to repair damage or protect against future attacks

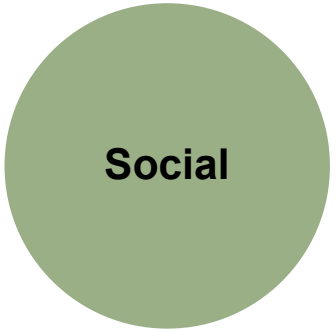
SOCIAL SUSTAINABILITY

Pro

- data protection
- protection against cybercrime
- protection against disinformation and fake news
- equal opportunities

Contra

- Information security on a lawful basis



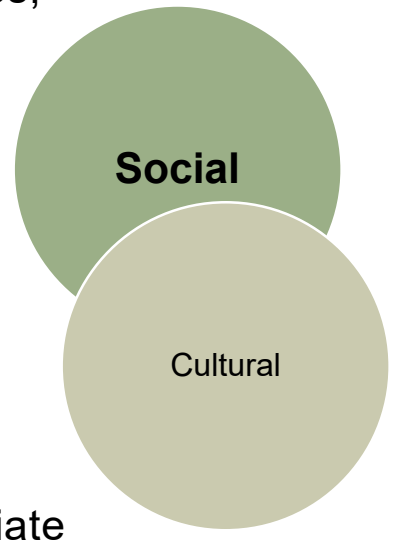
CULTURAL SUSTAINABILITY

Pro

- protection and preservation of valuable information (cultural heritage)
- protection and confidentiality of data and information associated with the cultural beliefs, values, and traditions of specific communities
- protecting individual privacy and freedom

Contra

- neglecting cultural aspects and differences when designing and implementing information security measures
- e.g. not adapting training and training materials, using languages or symbols that are appropriate for certain cultures



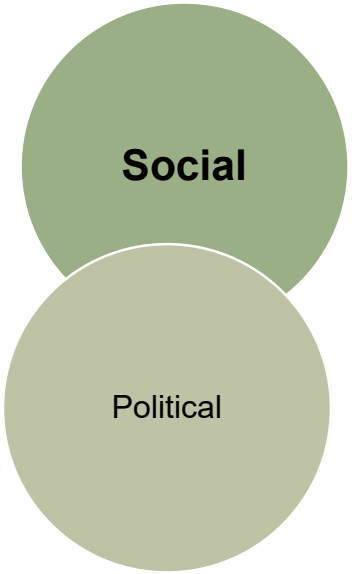
POLITICAL SUSTAINABILITY

Pro

- ensures the stability and security of governments and societies
- protect government institutions and infrastructures and ensure the integrity and confidentiality of information and data
- meet the needs of citizens

Contra

- misuse of information security to restrict civil rights



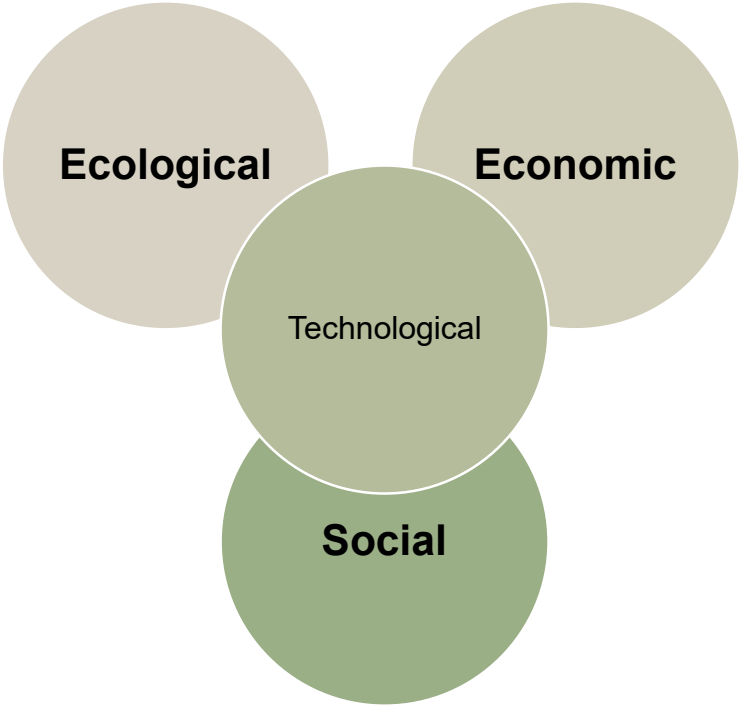
TECHNOLOGICAL SUSTAINABILITY

Pro

- ensures that new technologies and systems can be used securely and efficiently
- ensures that they function reliably and can be used effectively in the future
- maintains trust in digital systems and technologies

Contra

- can lead to a loss of trust in digital systems and technologies and potentially limit their adoption and diffusion



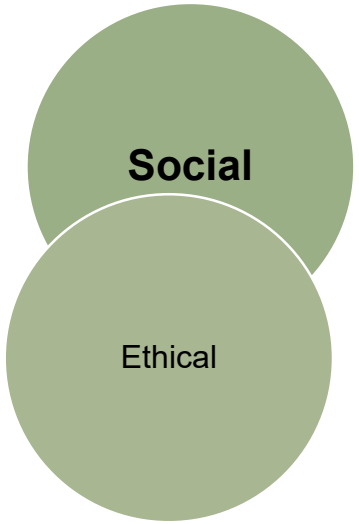
ETHICAL SUSTAINABILITY

Pro

- ensures that privacy and personal data are protected and that technologies and data are not misused for unethical purposes
- ensures that individuals' rights and privacy are treated with respect and protected
- ensures the integrity of digital systems and technologies to ensure they are not used to spread misinformation, manipulation, or discrimination.

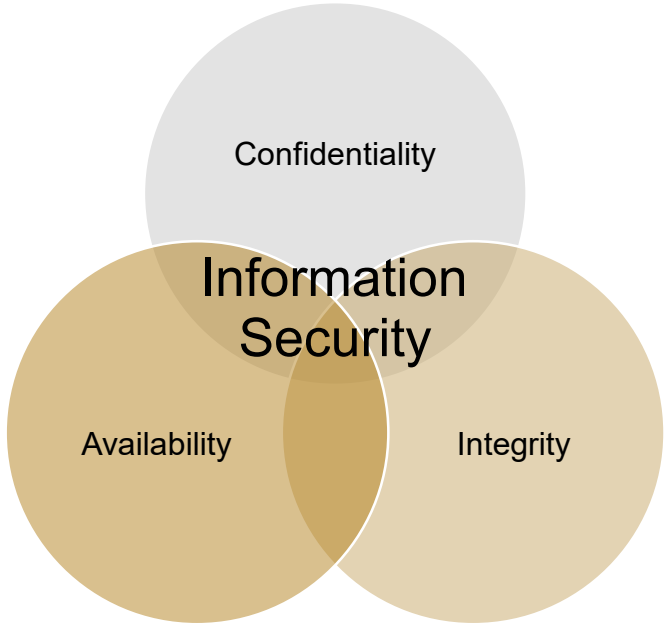
Contra

- ethical considerations not incorporated in the development of information security strategies
- data from individuals can be collected, sold or even stolen without their consent



CONCLUSIONS

Relationship?

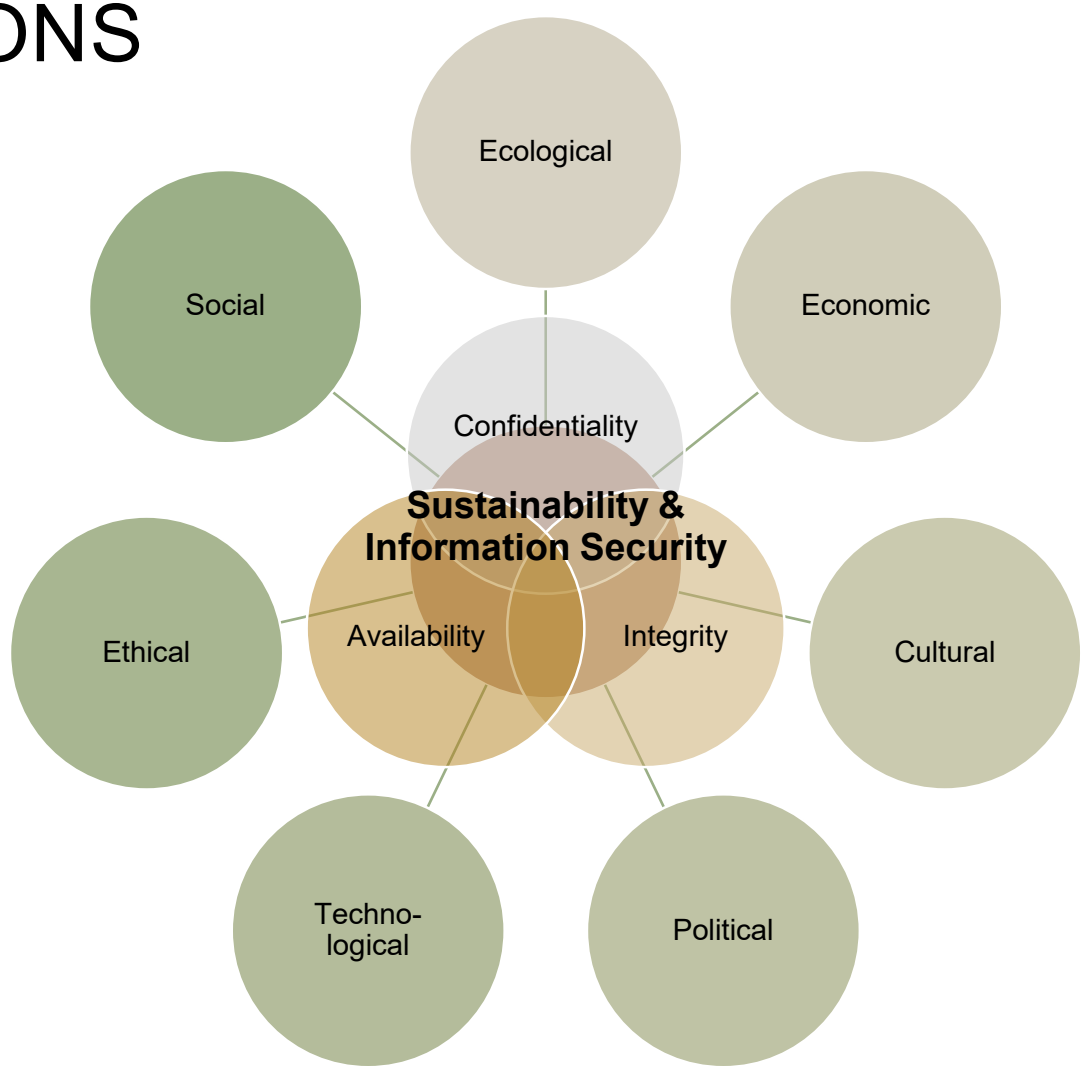


CONCLUSIONS

Where can information security counteract sustainability aspects?

- Resource intensity
- Restrictions on availability
- Data backup
- Privacy conflicts
- Surveillance
- Restricting freedom of information

CONCLUSIONS



FINAL DEMANDS

Adapted from Maryam Del Pisheh (2022), the need to combine sustainability and information security can be summarized in the following **three demands on all stakeholders**:

1. Understand the intersection between sustainability and cybersecurity - The rapidly growing digital world must be leveraged to make the physical world more sustainable. To create robust solutions, the overlap between cybersecurity and sustainability risks must be clearly identified.
2. Govern the link between sustainability and cybersecurity - ensure that goals, policies, societal roles, and practices cover the links between sustainability and cybersecurity requirements and are governed across the ecosystem. This multi-level governance is essential for the continuous assessment and management of cyber threats and sustainability risks.
3. Drive integration of sustainability and cybersecurity - different stakeholders need to fully understand not only sustainability and cybersecurity risks, but also their role in managing and mitigating these risks to support overall resilience.

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LIVE VOTING BEST PAPERS

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COFFEE BREAK

14:45-15:00 Uhr

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DISCUSSION FORUM WITH ALL PARTICIPANTS

15:00-15:45 Uhr

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BRIEF SUMMARY, AWARDING THE TWO BEST PAPERS AND CONFERENCE EVALUATION

15:45-16:00 Uhr

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EVALUATION

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Thank you for being here!!!