

An abstract blue line graphic that starts as a thin curve on the left, rises to a peak, and then descends as a thicker line that loops around the text.

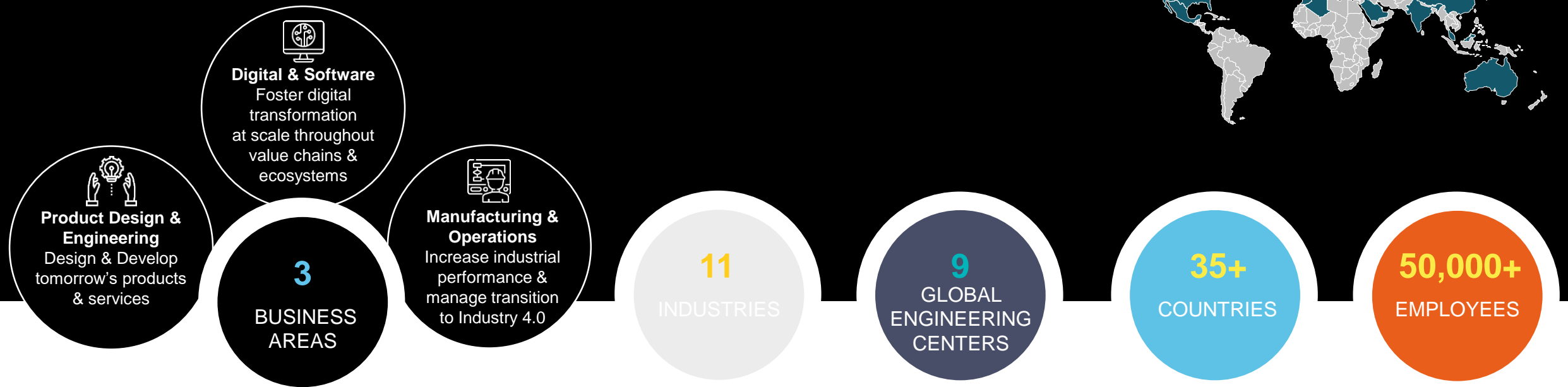
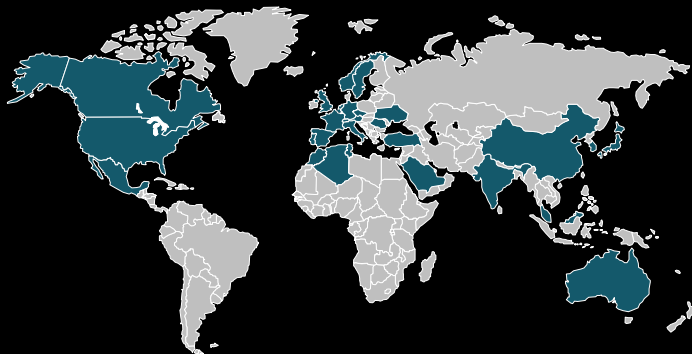
**GET THE  
FUTURE  
YOU WANT**



# CIRCULAR ECONOMY TO BOOST AEROSPACE INDUSTRY

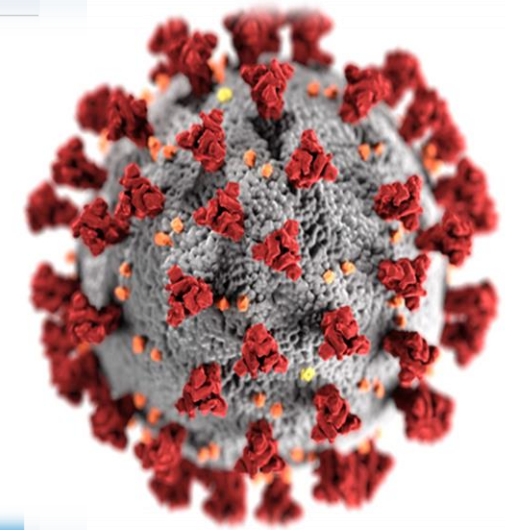
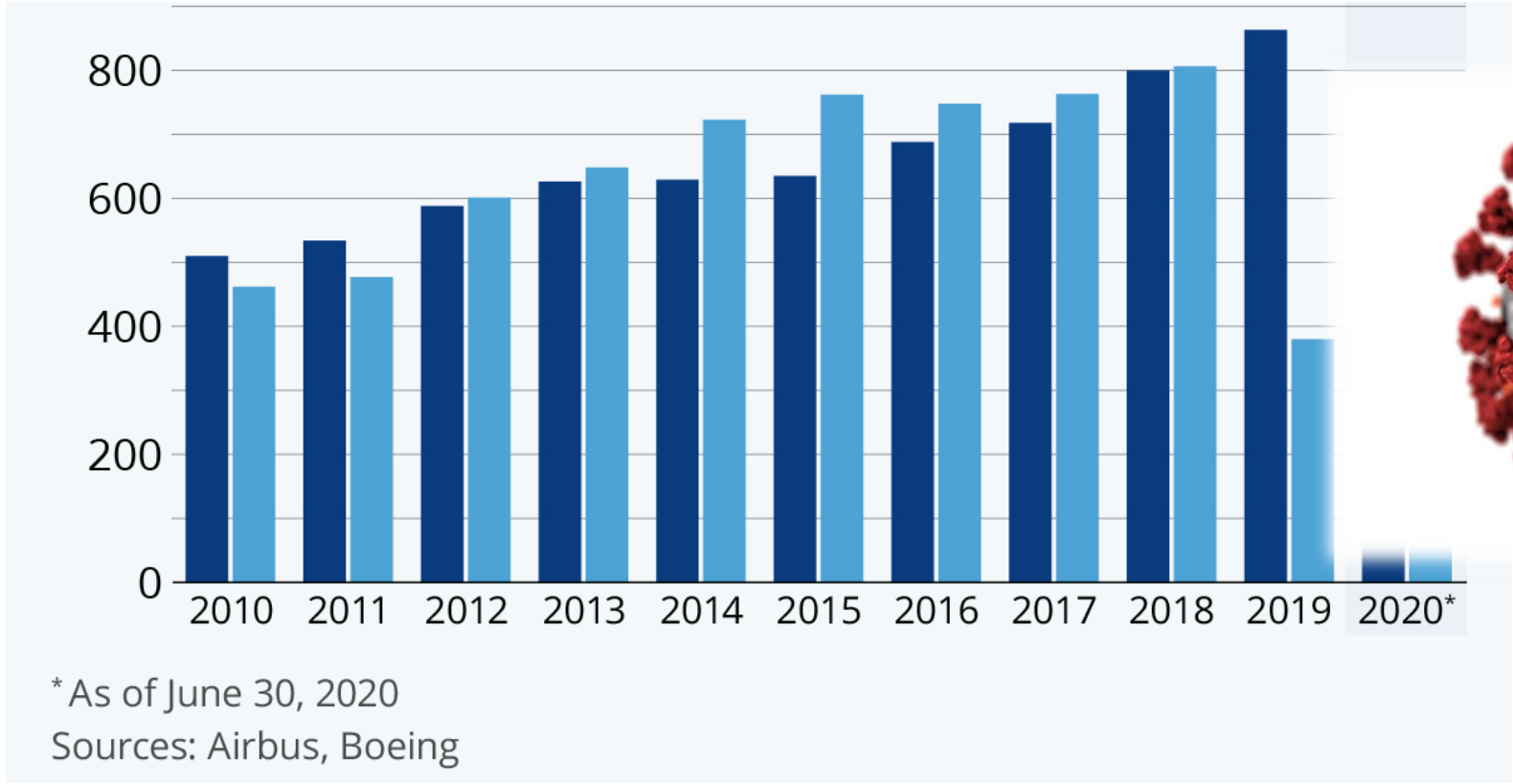
EASN conference  
03<sup>rd</sup> of Septembre 2021

# GLOBAL LEADER IN ENGINEERING AND R&D SERVICES





# THE CURRENT SITUATION









# AERONAUTICS MARKET DYNAMICS

## INCREASING AIRCRAFT DEMAND, IMPACTING PRODUCTION RAMP UP

More than **33000 aircrafts** required over the next 10 years.



## SMART CONNECTIVITY & SERVICES ENHANCING PASSENGER EXPERIENCE

**\$130 billion** in ancillary revenue for airlines by 2022.



## TRANSITION TOWARDS INCREMENTAL DEVELOPMENT WHILE PREPARING THE AIRCRAFT OF THE FUTURE

**25% to 40% reduction** in aircraft fuel consumption in near/mid-term thank to cost effective advanced technologies.

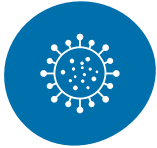


## DIGITALIZATION AND TECHNOLOGY CONVERGENCE

**\$305 billion** in value for the transportation industry over the next decade thanks to digitalization.



# Other market challenges



## Connectivity

In 2030, the market for B2B monetization of connected services is expected to generate around 20.7 billion U.S. dollars in revenue globally.

**\$7.8b in 2030**

*global market for B2B monetization of V2X content*



## New mobility

An increasing share of all new cars sold will be fully autonomous with self-learning AI, leading to more cyber vulnerabilities and a growing complexity for electronic architecture.

**15% in 2030**

*of new cars will be fully autonomous*



## Sustainability & Electrification

Electric vehicles will account for quasi an half of vehicles sold in 2030, compared to 2% in 2017, with increasingly strict CO2 emissions regulations driving sales.

**48% in 2030**

*of vehicles will be electric*



## Safety, Security & Service Orientation

The global Security as a Service market is expected to grow throughout the next years and projected to increase radically. Security solutions are high in demand to ensure data security.

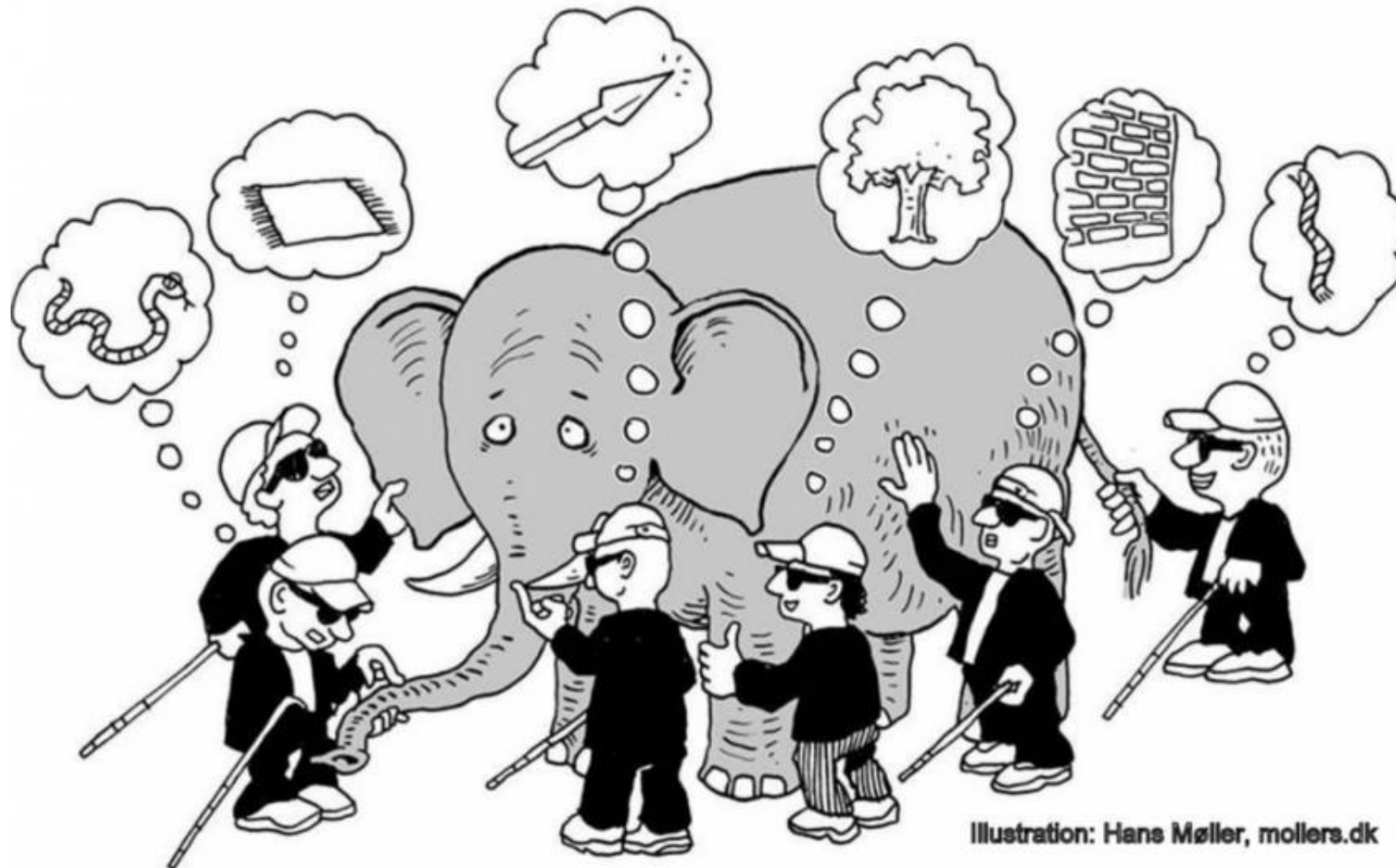
**\$22b in 2026**

*is the expected global security market*





# The Challenge: We do not have a global picture - yet.

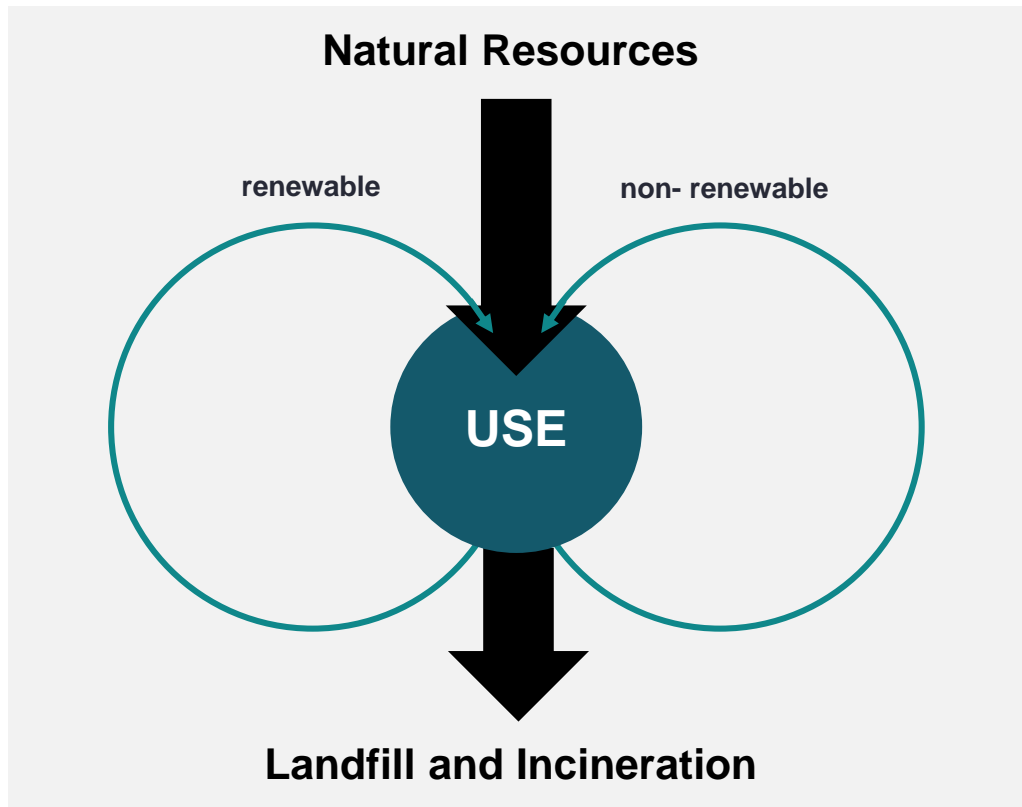




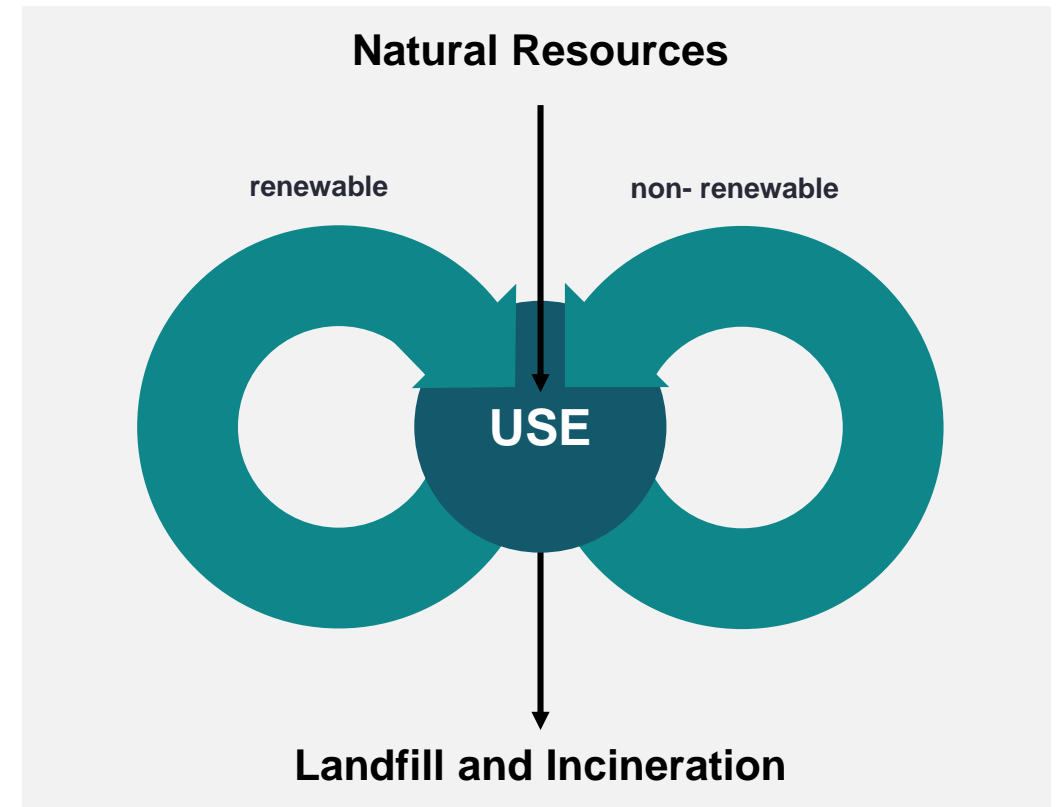


# THE BENEFITS OF CIRCULAR ECONOMY

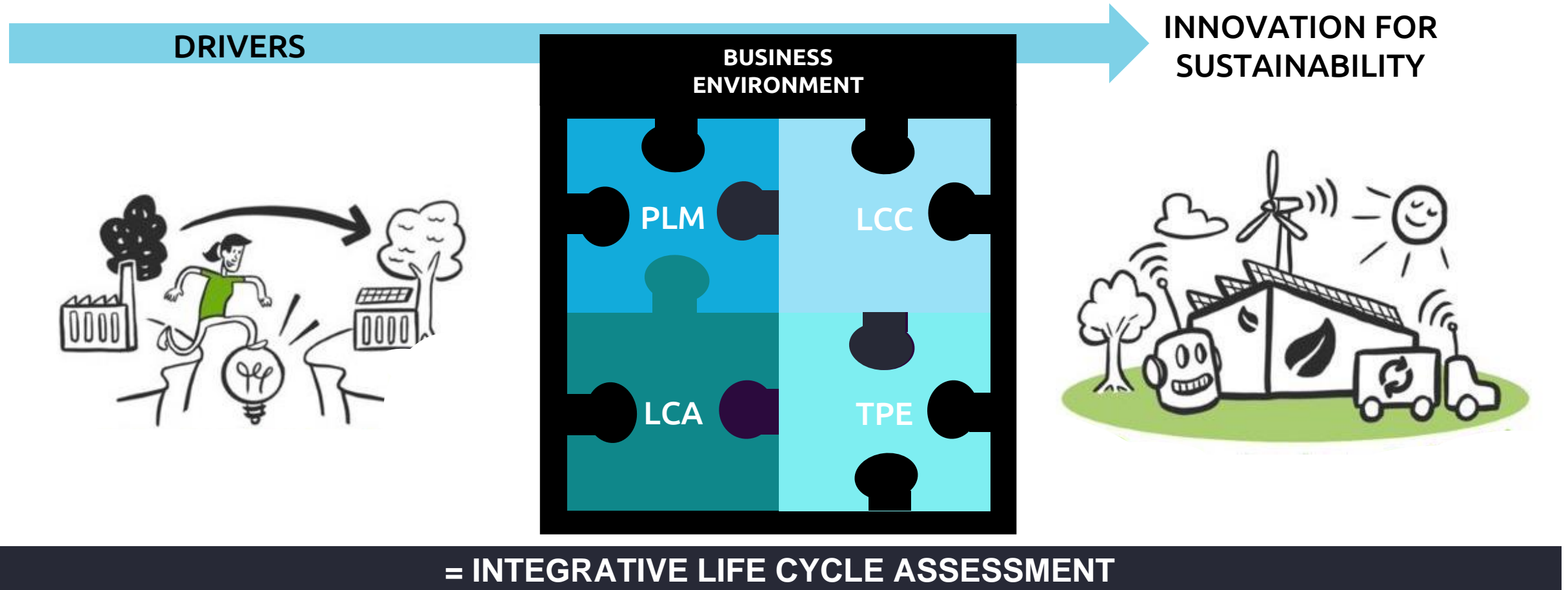
## LINEAR ECONOMY



## CIRCULAR ECONOMY



# AERONAUTICS MARKET DYNAMICS

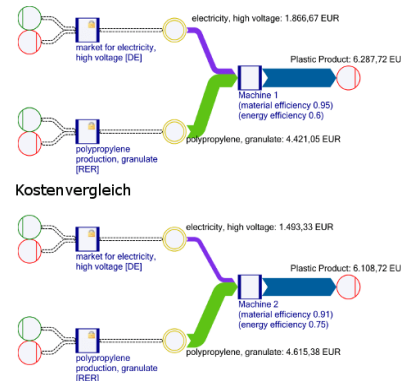




# A high variety of Cost and Environmental Impact Categories has to be considered to get a comprehensive picture of future products

## COST CATEGORIES:

- Depreciation
- Imputed interest
- Material costs
- Energy costs
- Labor costs
- Maintenance costs
- Occupancy costs

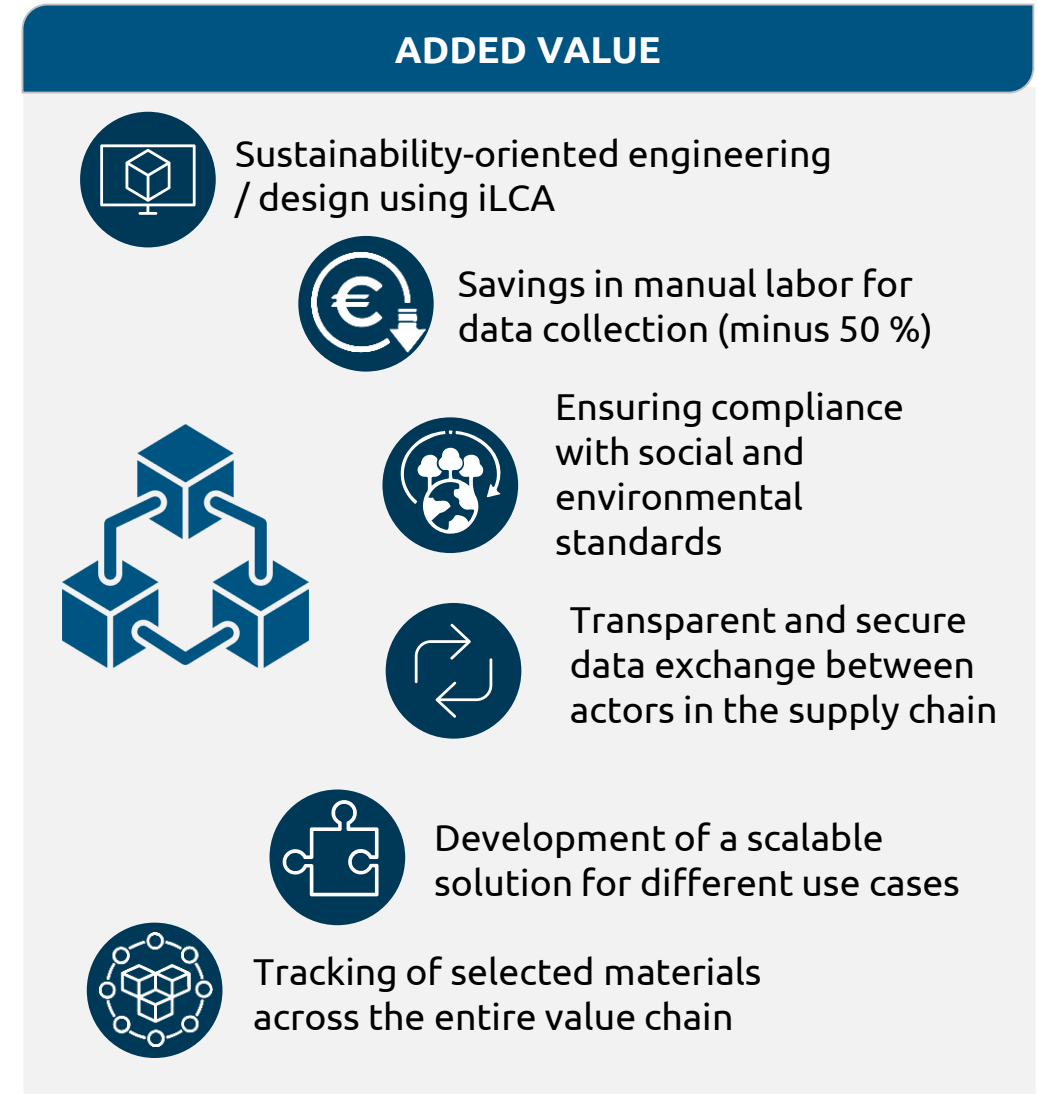
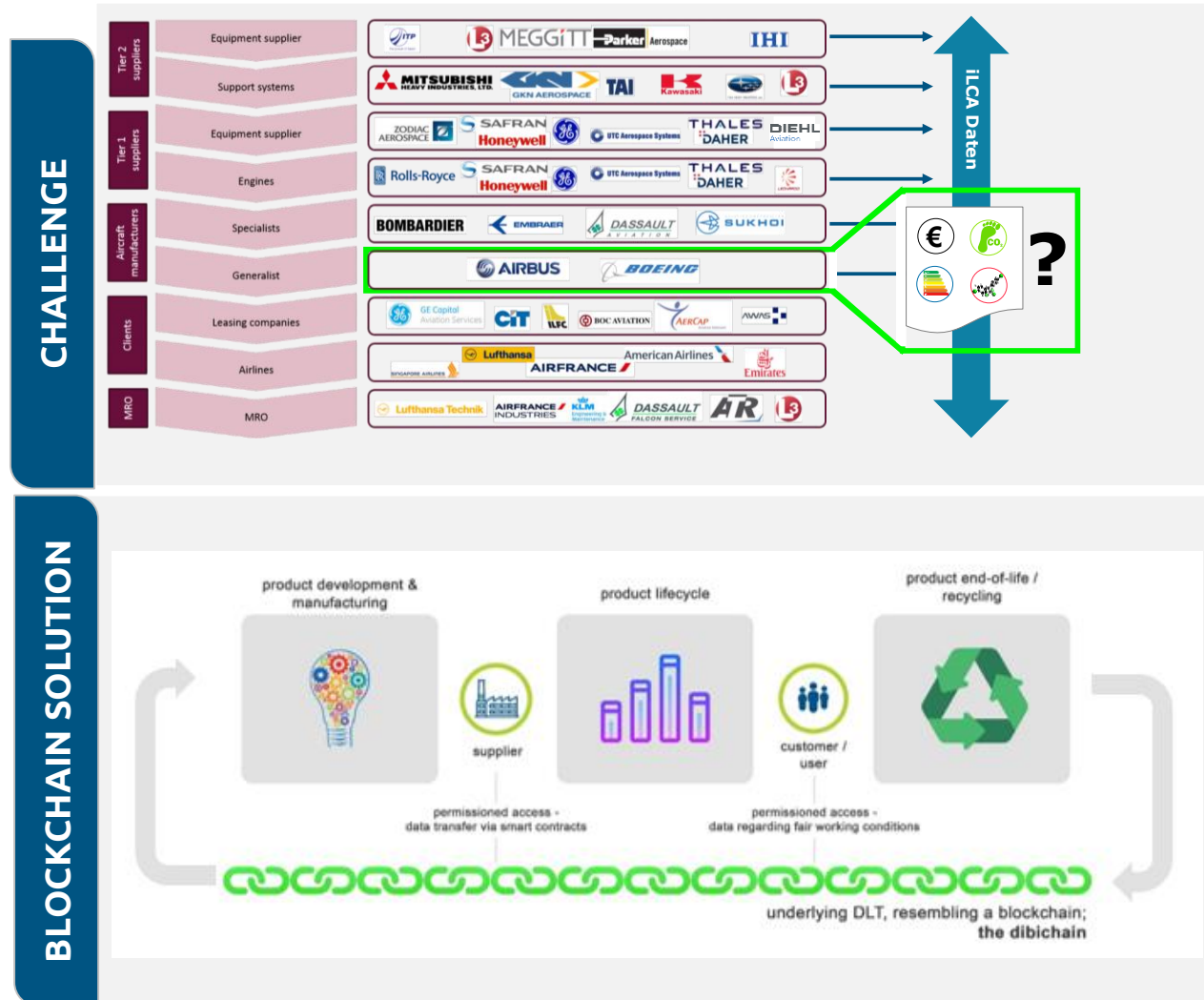


## ENVIRONMENTAL IMPACT CATEGORIES:

- Climate Change (GWP)
  - Primary Energy Use
  - Human Toxicity (HTP)
  - Acidification
  - Eutrophication
  - Stratospheric ozone depletion
- For each process and its flows



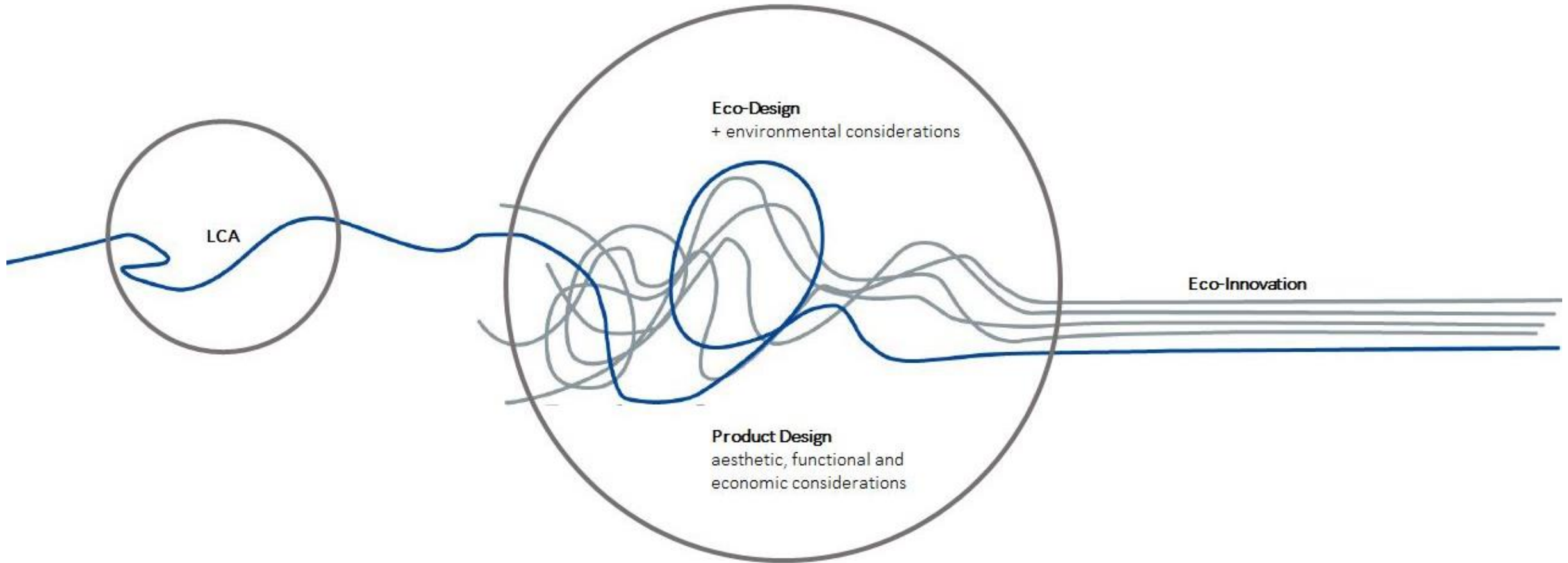
# Blockchain: An enabler for transparent supply chains and seamless iLCA integration





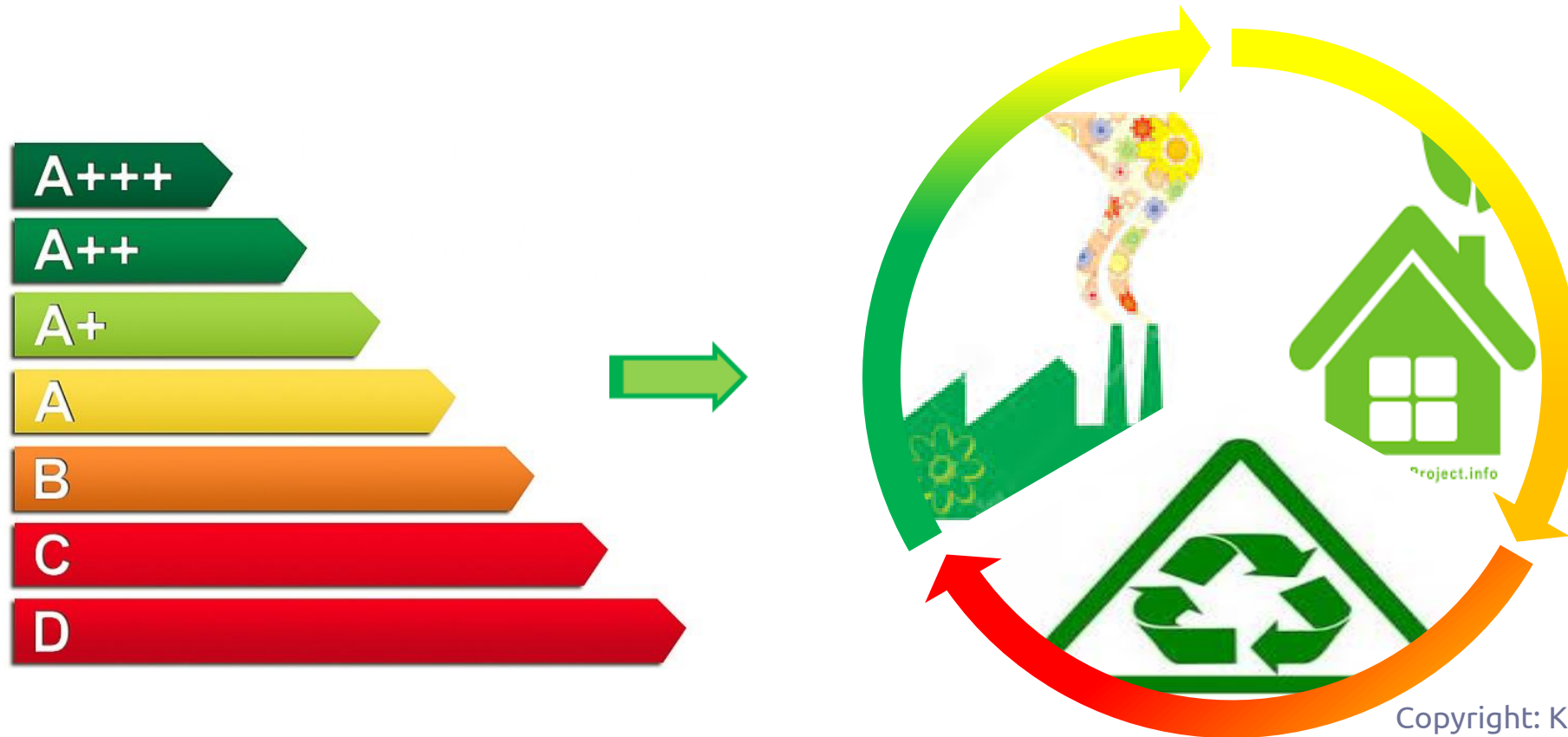


# FROM LCA TO ECO-INNOVATION: A SUSTAINABILITY MANAGEMENT APPROACH





# MAKE SUSTAINABILITY A DRIVER FOR INNOVATION!





# SUSTANABILITY FOR GROWTH





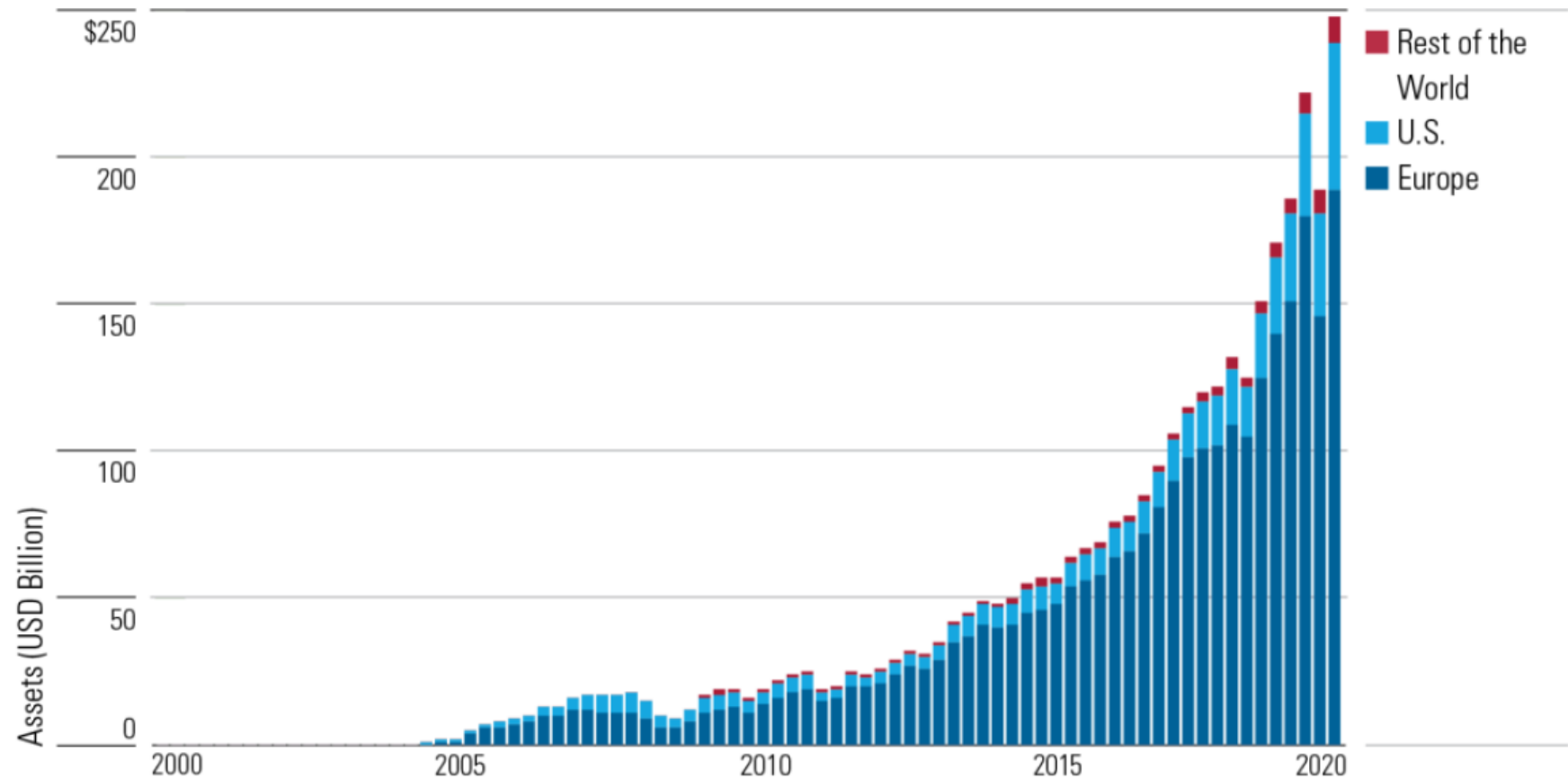
# SUSTANABILITY FOR GROWTH – NEW MARKETS







# SUSTANABILITY FOR GROWTH



Source: Morningstar Direct, Morningstar Research.



# KEY CHALLENGES: PARTNERSHIP IS THE ANSWER!

Gefördert durch:



Bundesministerium  
für Wirtschaft  
und Energie

aufgrund eines Beschlusses  
des Deutschen Bundestages



# SUMMARY



01

**Zero Emissions aerospace is possible**

02

**Aerospace has the chance to be the main driver for sustainability**

03

**Applying Circular Economy will open new business opportunities**

# CAPGEMINI ENGINEERING R&D PROJECTS

## TARGETING CURRENT AND FUTURE MARKET NEEDS



### FUTURE OF MOBILITY

#### TRINIDAT

Tilt Rotor Innovative Design And Wind Tunnel testing



Ecofriendly & cost- efficient Green Turboprop Experimental Laminar Flow Wind Tunnel testing



Interoperable Solutions for Mobility, Logistics – Company Network on ICT-driven Innovations

#### AORTA



Trajectory-based collective traffic management

### FUTURE NETWORKS & COMPUTE



Security & traceability in production and value net-works through Blockchain.



Digital portrayal of Circulatory Systems via Blockchain Technology



Demand side management platform and Smart Grid business models



Energy services and trading process based on blockchain

### FUTURE OF INDUSTRY GREEN ENERGY



Active flow control for an optimized wind harvest on wind turbines



PEM fuel cell optimization, market, technologies and LCA assessment



Sector coupling: emergency energy supply LCA assessment

### FUTURE OF INDUSTRY INNOVATIVE MATERIALS



Innovative and ecofriendly airframe technologies to improve aircraft life cycle environmental footprint



Unique Materials for Advanced Aerospace Applications

### FUTURE OF ENGINEERING



Retrofit emission reduction technology for HEAVY Duty Engines



Smart Intelligent Aircraft Structures



Design for automated Manufacturing and installation



Functionalization, design and test of additively manufactured components

### APPLIED AI



Artificial Intelligence for cybersecurity in connected and automated vehicles



AI Methods for Autonomous Driving: ADAS and auto pilots



GAIA-X4AI

European Compute & Data Infrastructure for Automotive & Mobility





# THANK YOU FOR YOUR ATTENTION





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