

BIM and its Impact on the Digitization Process of Building Materials



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General Manager
Fraunhofer Building Innovation Alliance



PERSONAL DESCRIPTION

Functions

- Managing Director Fraunhofer Building Innovation Alliance
- Head of SME 4.0 Competence Center Planning and Building

Education

- Diploma in Industrial Engineering, University for Applied Science Rosenheim
- Executive MBA at RWTH Aachen University and University of St. Gallen

Major Roles

- Management Board Member of the International Council for Research and Innovation in Building and Construction (CIB)
- Member of national standardization activities
- Part of the consulting team for the National Digitization Roadmap in Infrastructure
- Advisory Board Member of the Rationalization and Innovation Center for the German Economy RKW
- Advisory Board Member in the Computer Aided Facility Management Circle e.V.
- Member of the European Construction, built environment and energy efficient building Technology Platform (ECTP)



AN INNOVATION MASCHINE – WITH HIGH SPEED COMMUNICATION

MARKET-ORIENTED ALLIANCES



CONSTRUCTION



ENERGY



DIGITIZATION



MOBILITY



MASCHINERY AND PLANTS



HEALTH ECONOMY



CHEMICAL INDUSTRY



NUTRITION



70%

Contract Research

8

Lead Markets

74

Institutes

28.000

Employees

2.8 b€

Annual Research Volume

FRAUNHOFER BUILDING INNOVATION ALLIANCE

FIELDS OF ACTION

DIGITAL TRANSFORMATION

Digital Communication, BIM, Digital Twins, IoT, AI



SMART CITIES / SMART BUILDINGS

IoT, AI, Cloud Computing, Common Data Environments, Linked Data



CLIMATE NEUTRALITY

Energy Efficiency, Climate Neutrality, Sustainability, Ökologization, Urban Green



INDUSTRIALIZATION/MODULARIZATION

Prefab, System Development, Logistics, Robotic, Renovation-Prefab



INNOVATIVE MATERIALS

Biobased-, Bionic-, Programmable-, Composite Materials, New Insulation



CIRCULAR ECONOMY

Cradle2Cradle, Recycling, Urban Mining, New Materials



NEW WORK

Activity Based Working, Open-/Flex Desk, Work 4.0



COMFORT & HEALTH

Indoor Climate, User Focused Design, Fraunhofer vs Corona



SAFETY & RESILIENCE

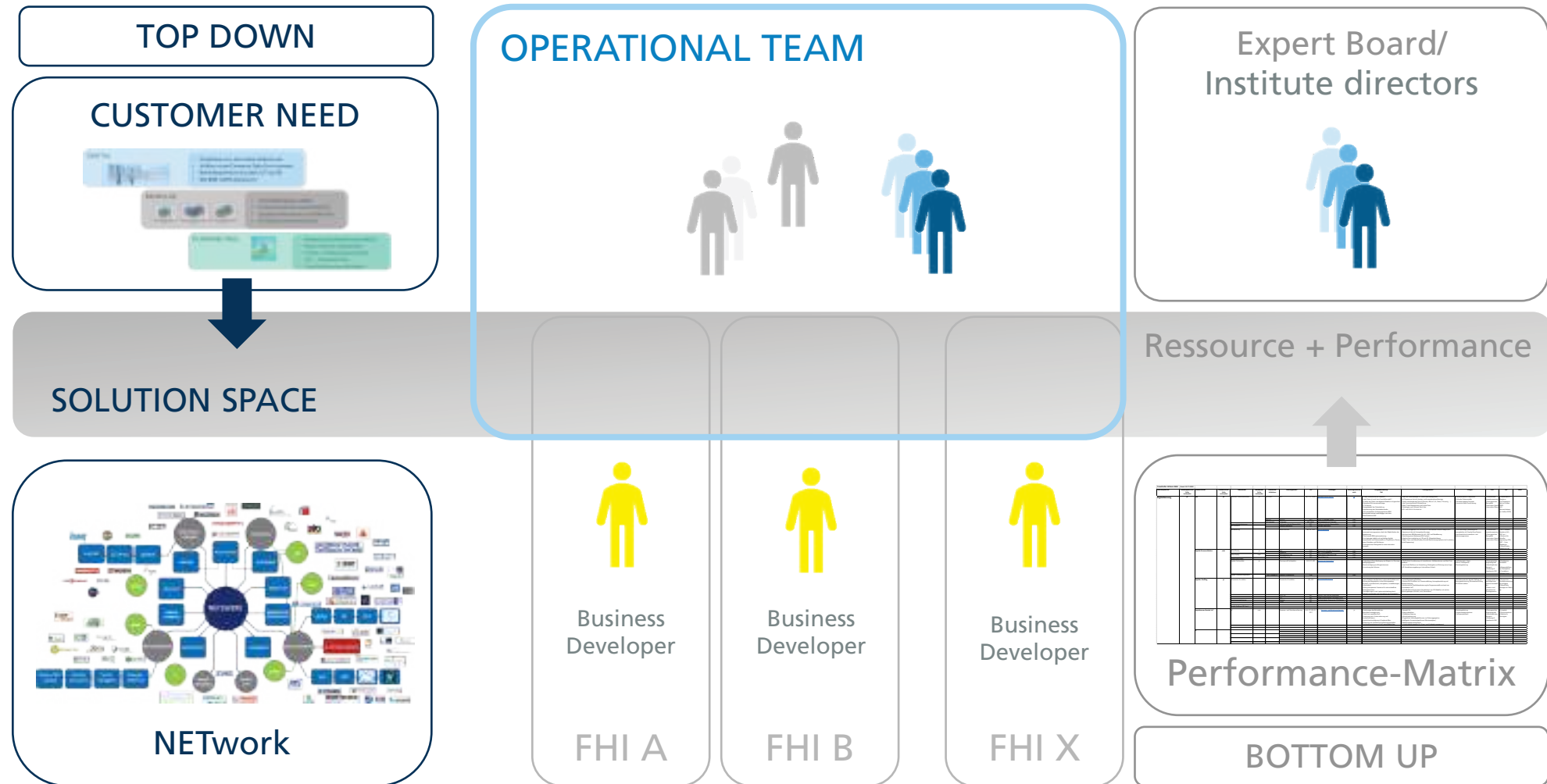
Flood protection, Earthquake resistance, Terror protection, IT Security



Eine große Aufgabe – ein gutes und erfahrenes Team



FRAUNHOFER BUILDING INNOVATION ALLIANCE ÖKO-SYSTEM AND SOLUTION STRUCTURE



CONSTRUCTION INDUSTRY

LARGEST BUSINESS OF THE WORLD – BUT A POOR PERFORMANCE

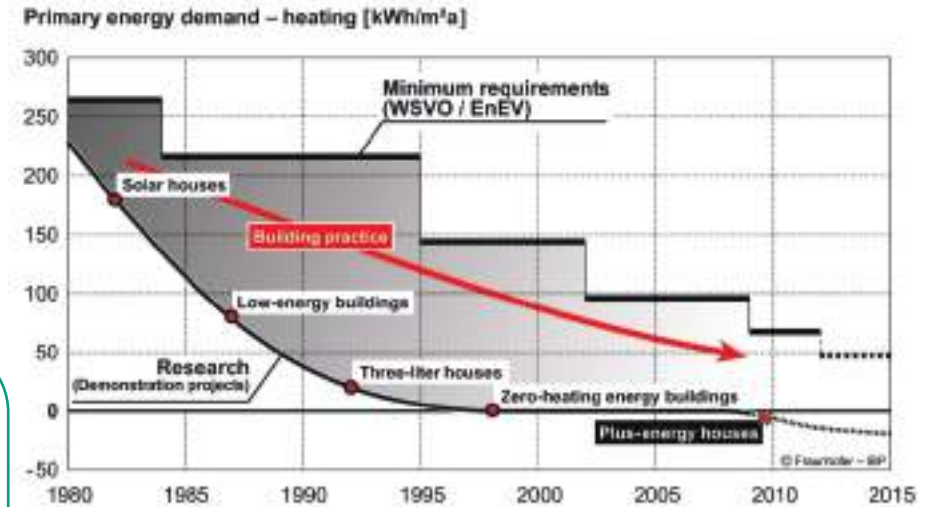
“The building sector accounts for a value of USD 10.4 trillion in 2017 and that figure is expected grow to USD 18 trillion by 2030.”

Roland Berger

“Buildings are responsible for 40% of energy consumption and 36% of CO₂ emissions in the EU. While new buildings generally need fewer than 3 to 5 liters of heating oil per square meter per year, older buildings consume about 25 liters on average.”



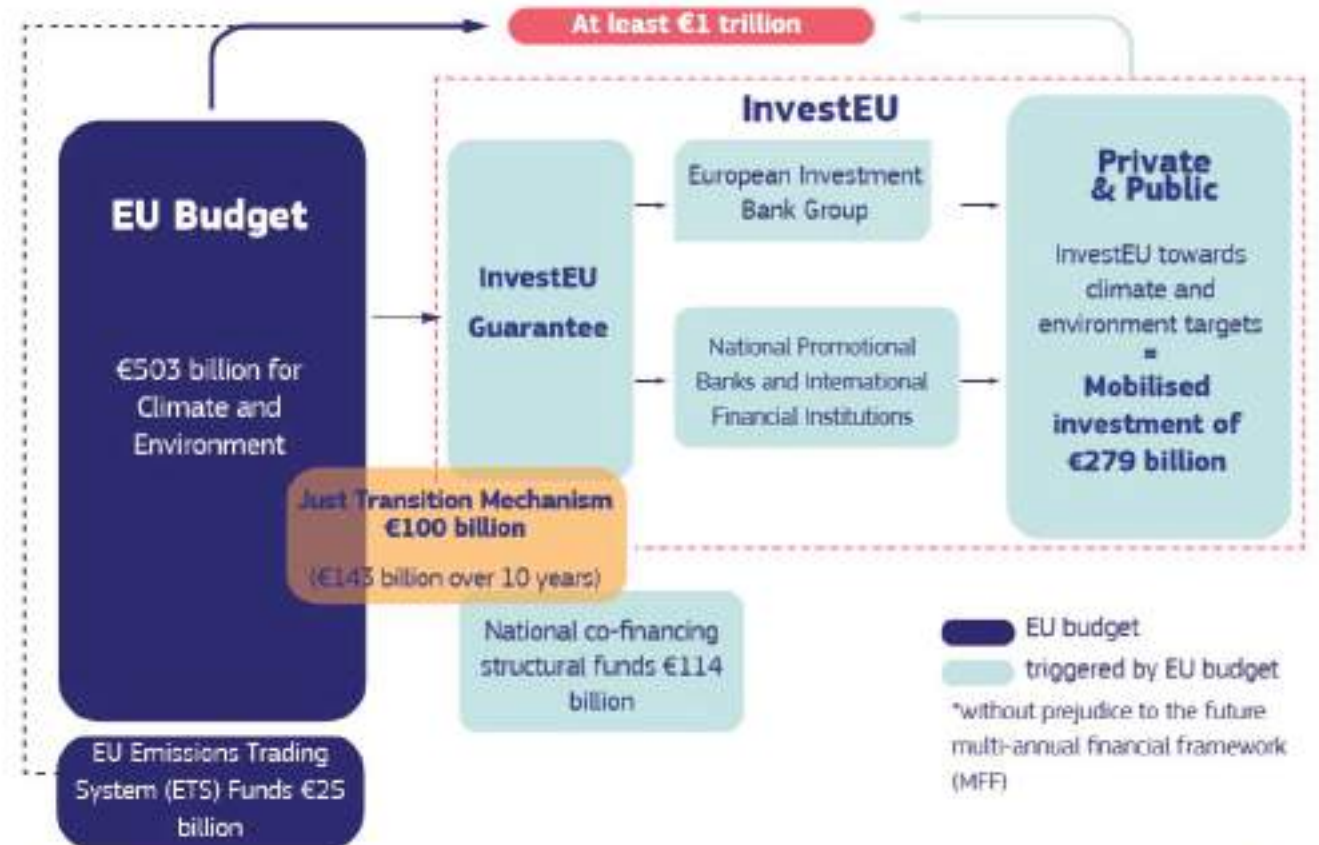
European Commission



EUROPEAN UNION ENOURMOUS EFFORT TO COPE WITH THE TASK

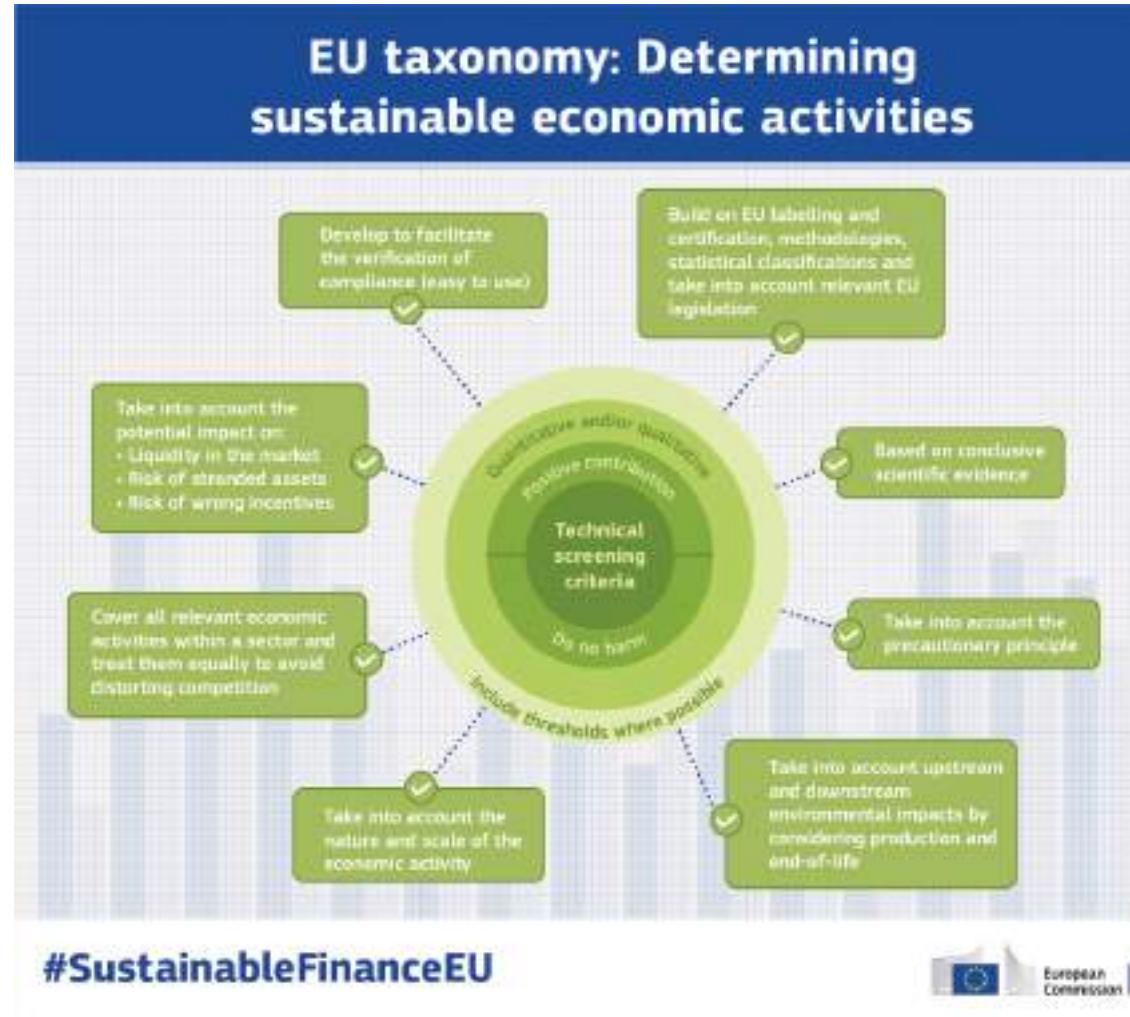


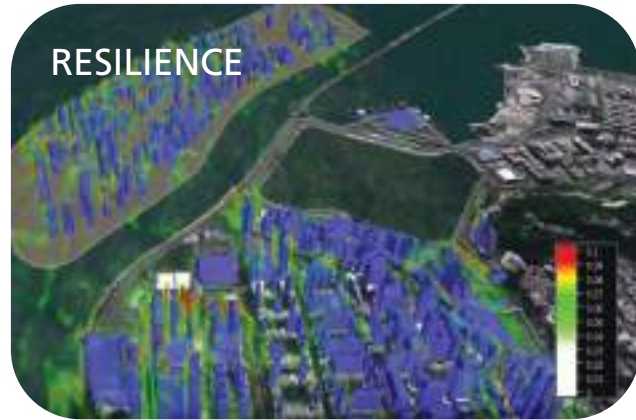
WHERE WILL THE MONEY COME FROM?



*The numbers shown here are net of any overlaps between climate, environmental and Just Transition Mechanism objectives.

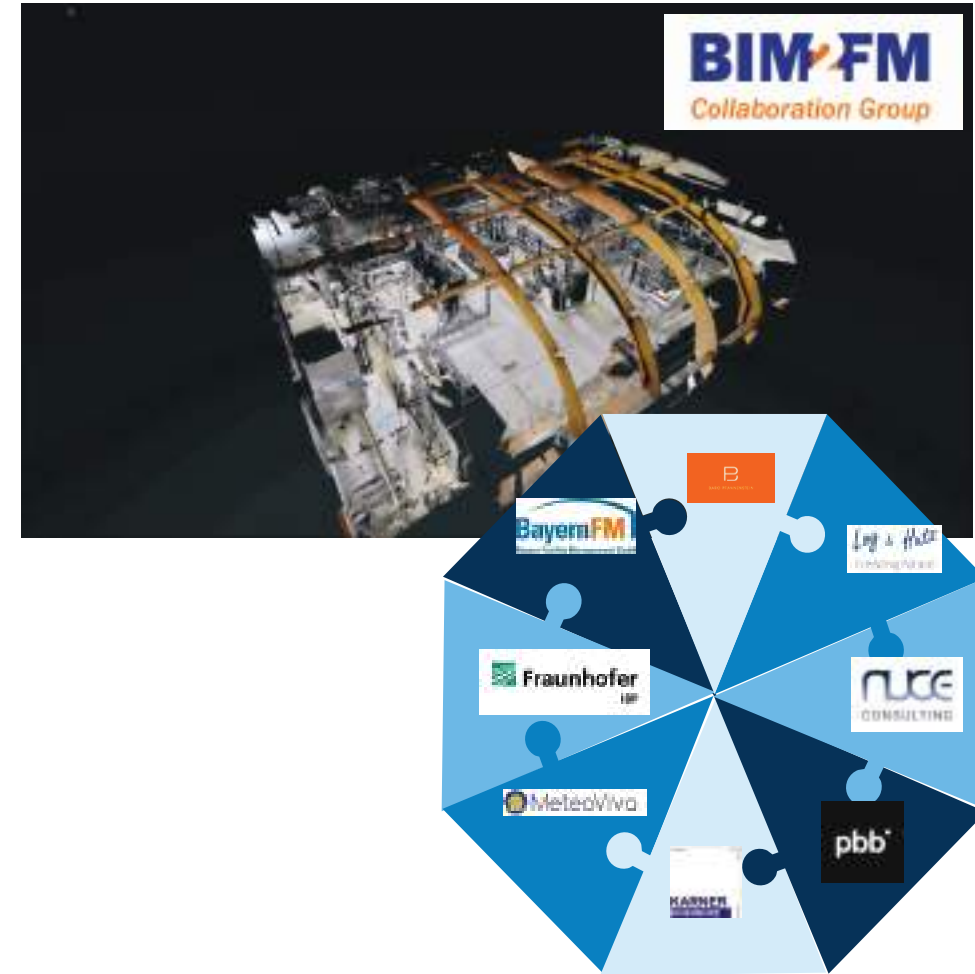
SUSTAINABLE FINANCE DRIVERS FOR CHANGE



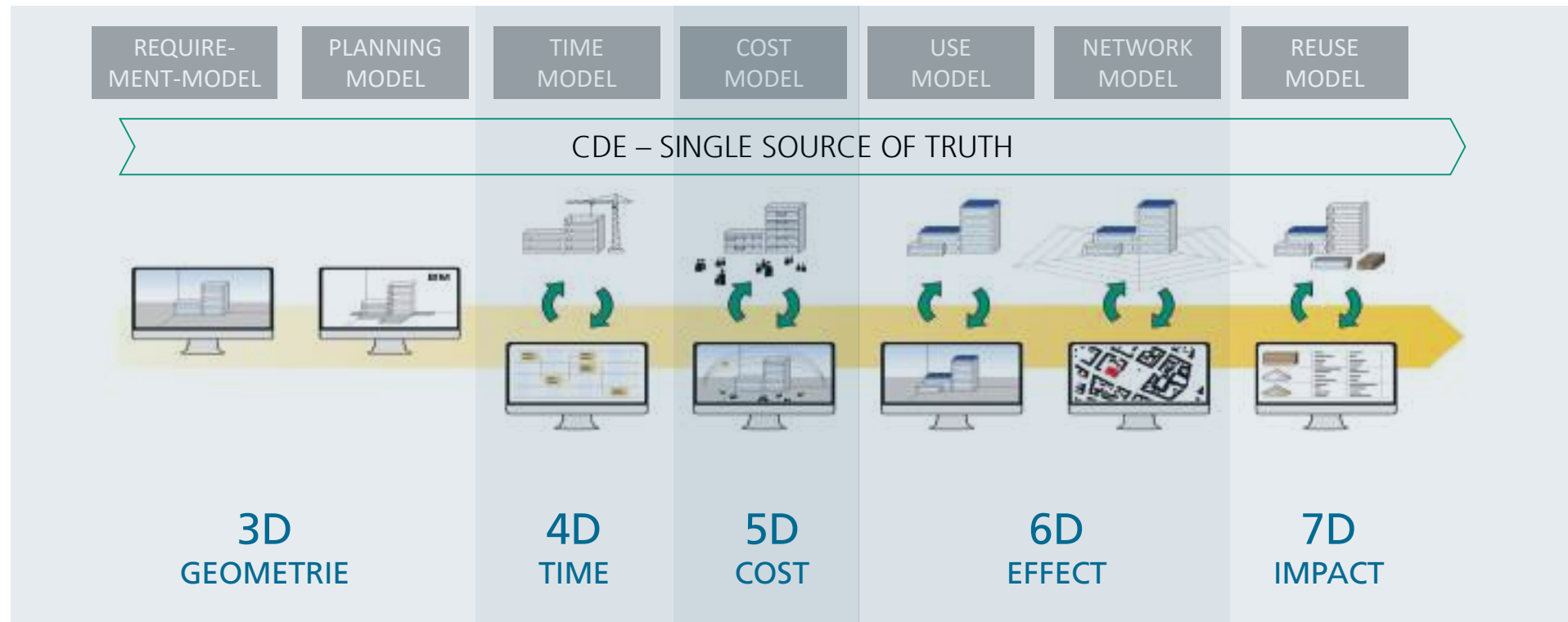


DIGITAL TWINS FROM BIM2FM

Bestand 4.0

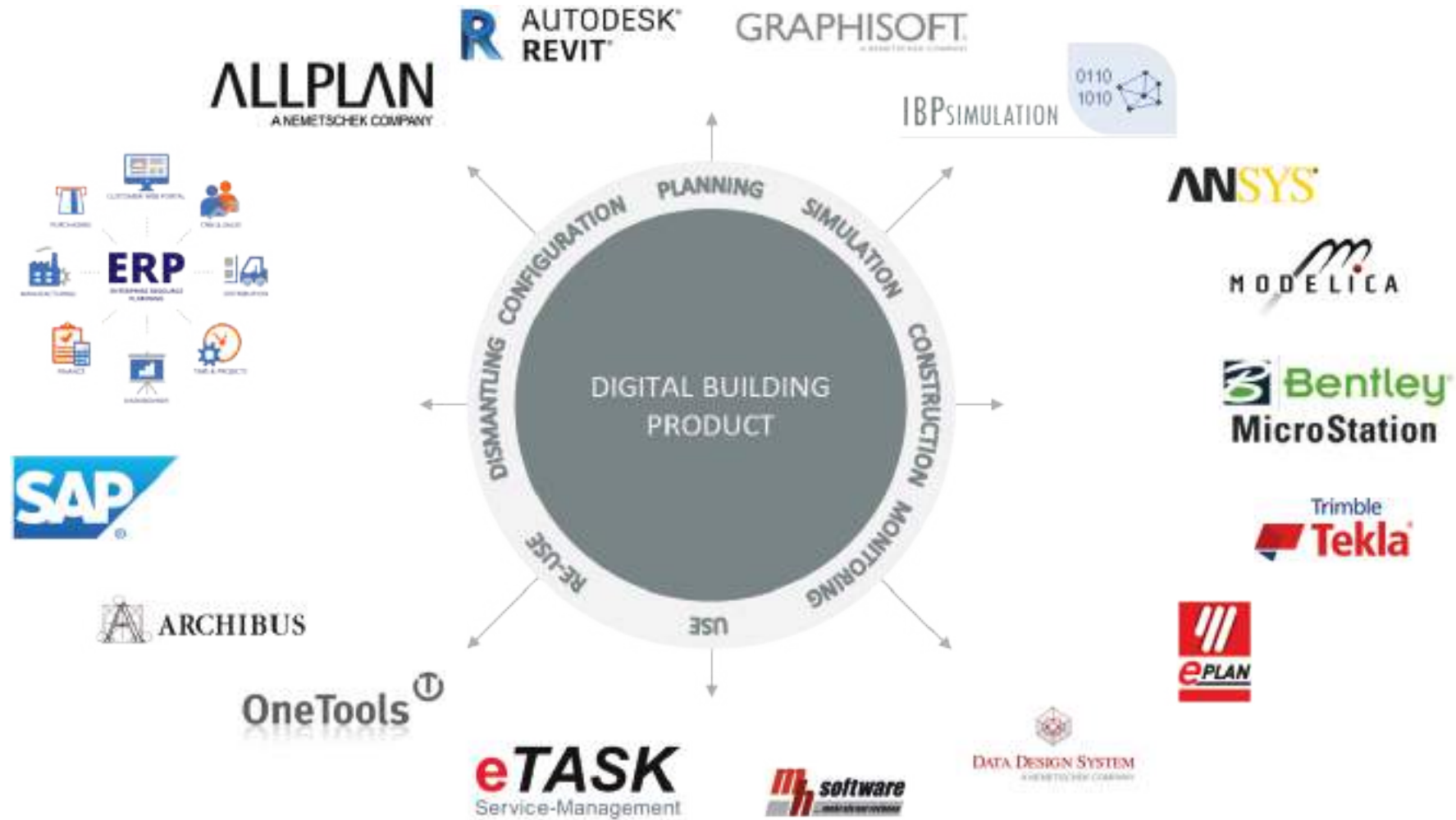


DIGITAL TWINS FROM BIM2SIM



BIM2PIM

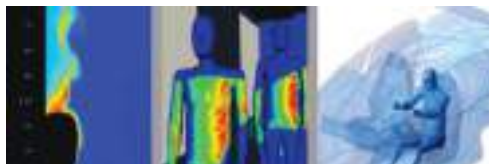
CHALLENGE FOR BUILDING PRODUCT AND BUILDING MATERIAL DIGITIZATION



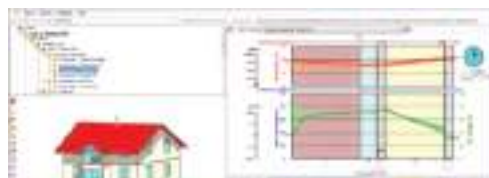
FRAUNHOFER NUMERICAL SIMULATION AS DIGITAL TWINS



LIGHT SIMULATION

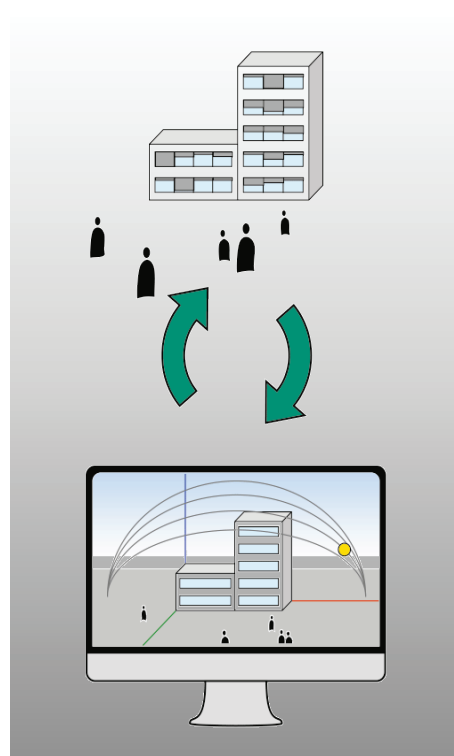


COMFORT/FLOW SIMULATION



ENERGY SIMULATION

IBP-CONNECT



IBP-CONNECT



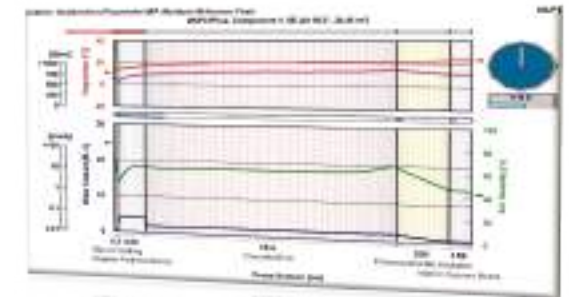
ACOUSTIC SIMULATION



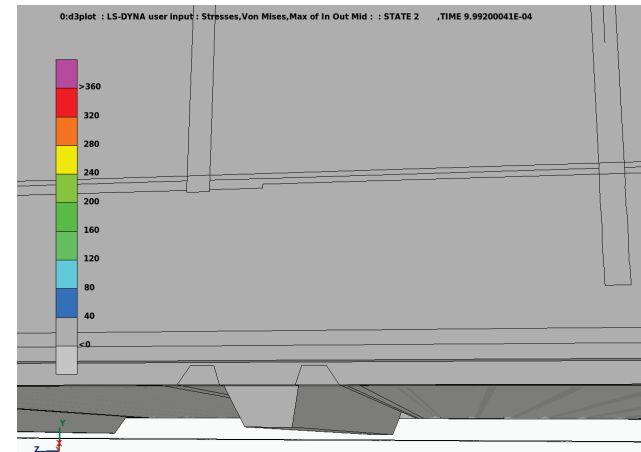
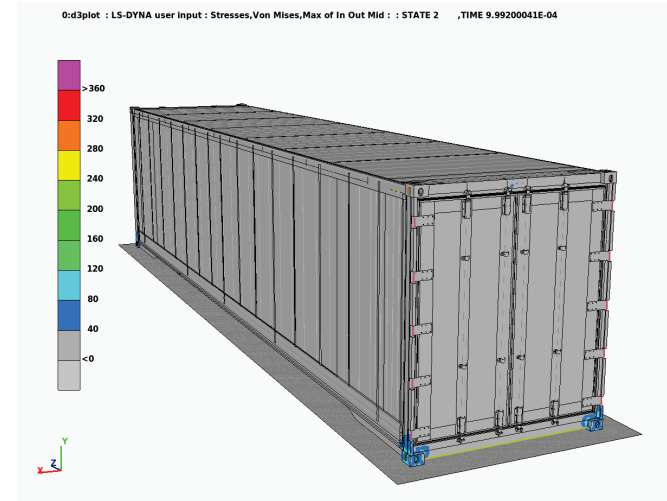
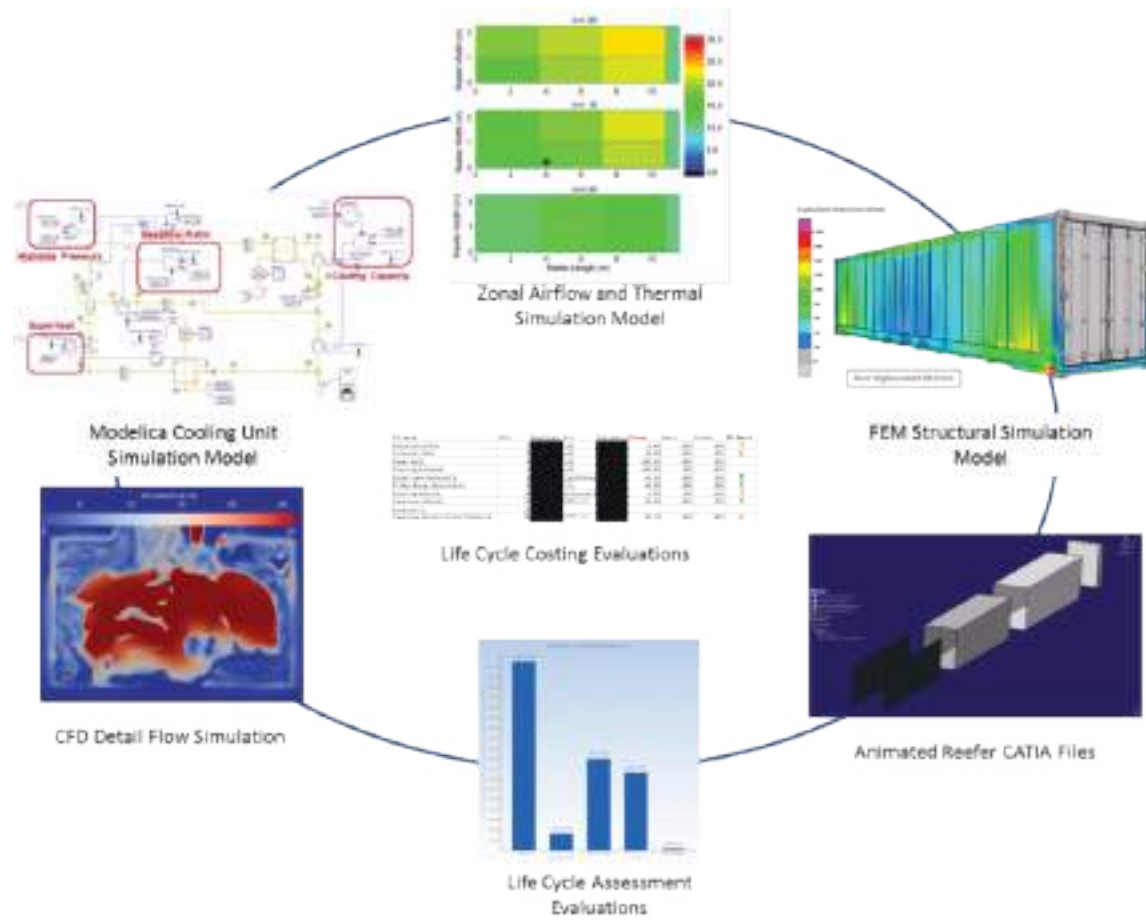
ENVIRONMENTAL SIMULATION



MEP SIMULATION

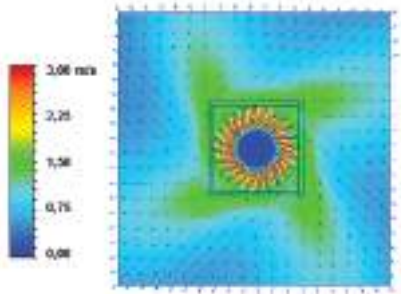


FRAUNHOFER VIRTUAL ENGINEERING PLATFORMS



VIRTUAL PRODUCTS

UNDERSTANDING HOW TO CREATE IMPACT MODELS

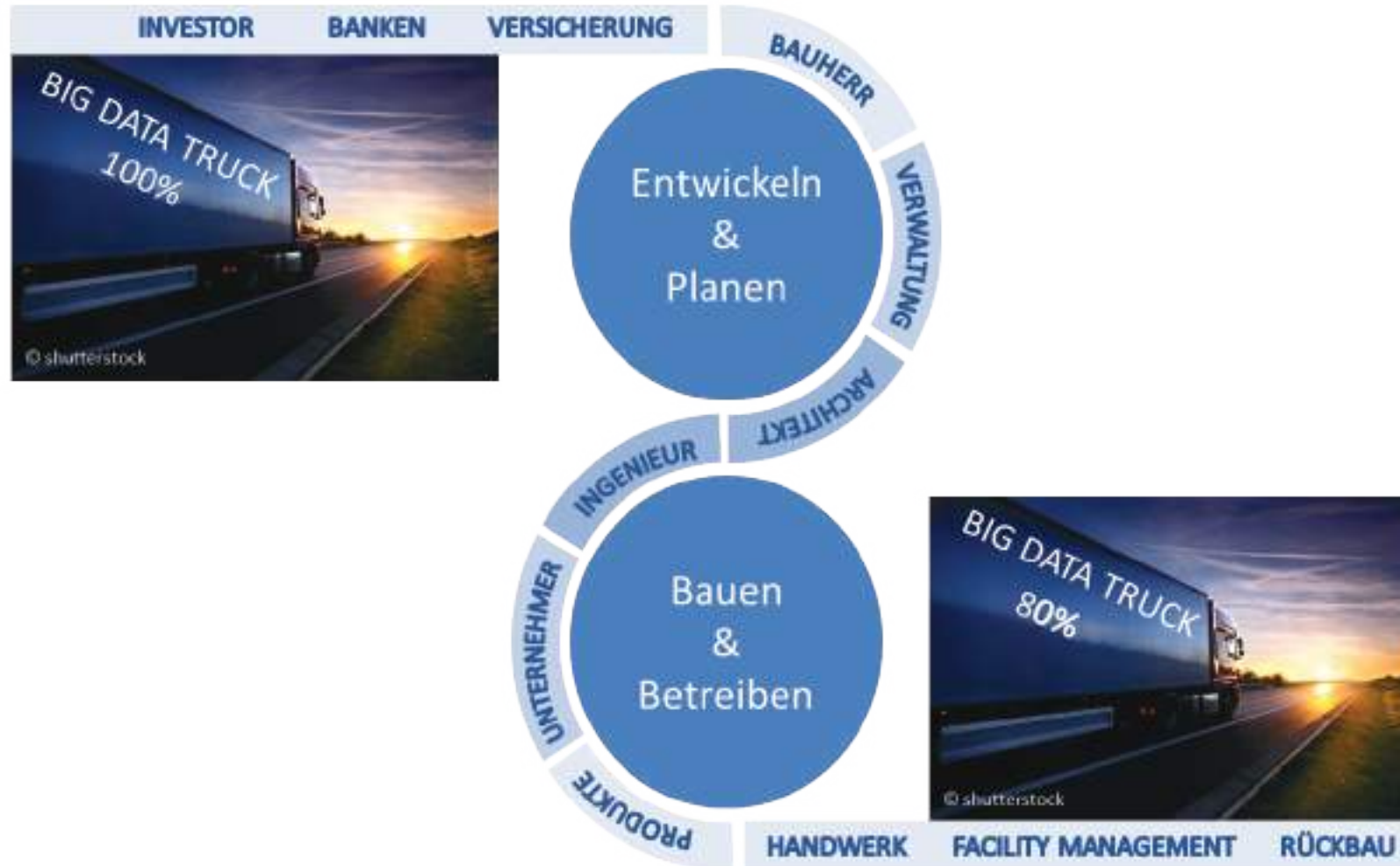


Quelle: CG Elementum AG/EMC

MIXED REALITY VIRTUAL SAMPLING

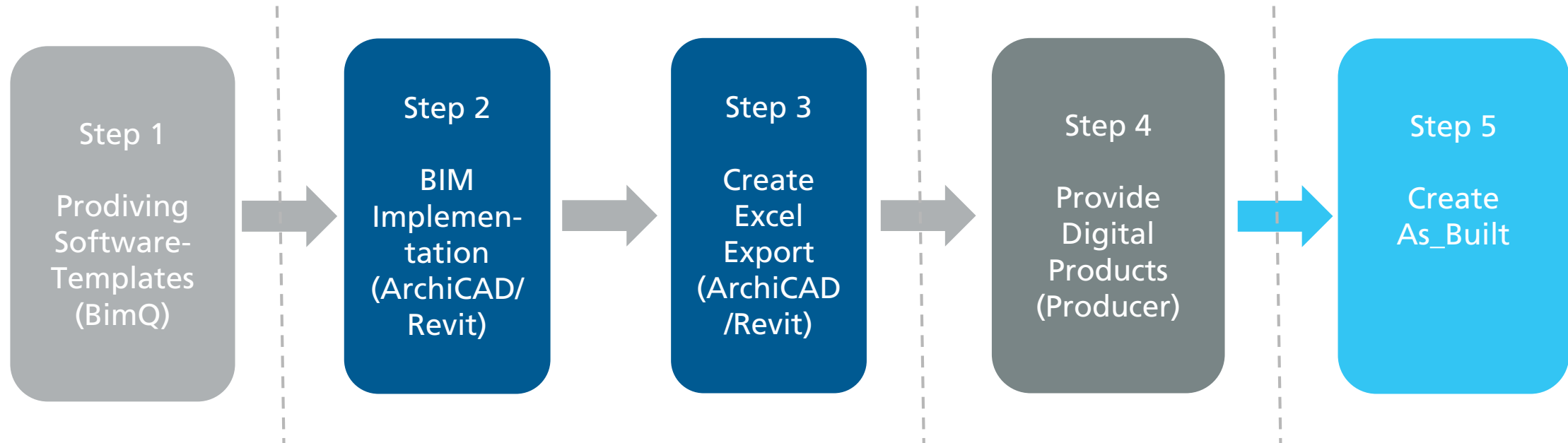


PRODUCER JOURNEY TO BIM UNDERSTANDING PROCESSES



PRODUCER JOURNEY TO BIM

BIM TRANSFORMATION JOURNEY FOR A PRODUCT/MATERIAL



Quelle: Fraunhofer IBP/Deutsche Bauchemie - Handlungsleitfaden

TRY FAST – LEARN FAST EXPERIANCE LABS TO ACCELERATE SPEED



THANKS!

