

TIME TO CHANGE

„Digitalisierung in der Bauwirtschaft – Future Trends“

Thomas Kirmayr

Geschäftsführer Fraunhofer Allianz Bau

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ZUR PERSON

Funktionen

- Geschäftsführer Fraunhofer Allianz Bau
- Leiter Mittelstand 4.0 Kompetenzzentrum Planen und Bauen

Ausbildung

- Dipl.-Wirtschaftsing, University for Applied Science Rosenheim
- Executive MBA at RWTH Aachen University and University of St. Gallen

Wichtige Funktionen

- Management Board Member des International Council for Research and Innovation in Building and Construction (CIB)
- Mitglied nationaler Normierungsgremien
- Beiratsmitglied im RKW-Bau
- Beiratsmitglied im CAFM-Ring e.V.
- Mitglied der European Construction, built environment and energy efficient building Technology Platform (ECTP)
- Teil des Ausbilderteams für den VDI BIM-Fachingenieur



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

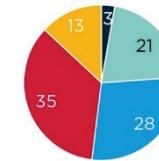
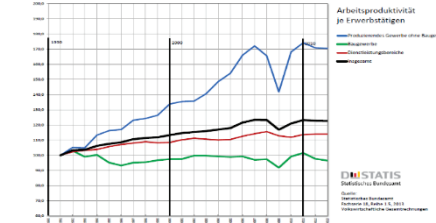
BAUWIRTSCHAFT

GROSSES POTENTIAL – SCHLECHTE 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

Bauen in Deutschland - Produktivität

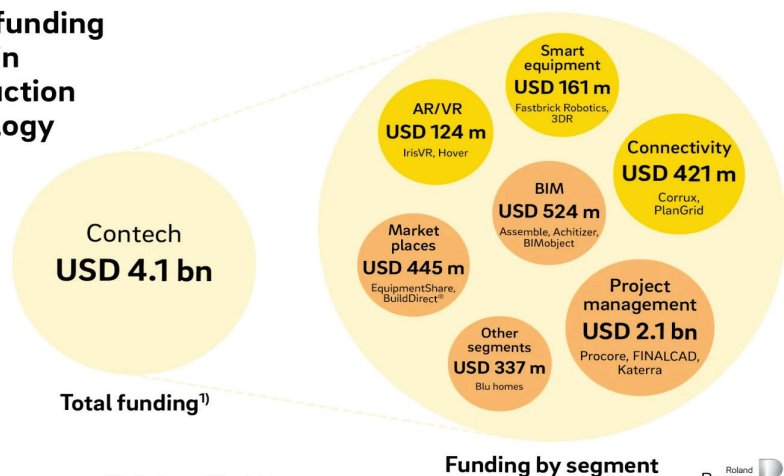


Fehlerkosten
~ 21 Mrd. € 2019



Quelle: BauInfoConsult

Global funding trends in construction technology



Source trackx; Roland Berger

¹) Total funding since 1999 tracked via trackx

Funding by segment

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

DIGITIZATION AS THE KEY

THE NEW NORMAL – BAUWIRTSCHAFT IM WANDEL



FUTURE TRENDS

AKTIVITÄTSFELDER

DIGITALE TRANSFORMATION

Digitale Kommunikation, BIM, IoT, KI

KLIMANEUTRALITÄT

Energieeffizienz, CO2-Neutral (ESG/SDG), Ökologisierung

NEUE MATERIALIEN

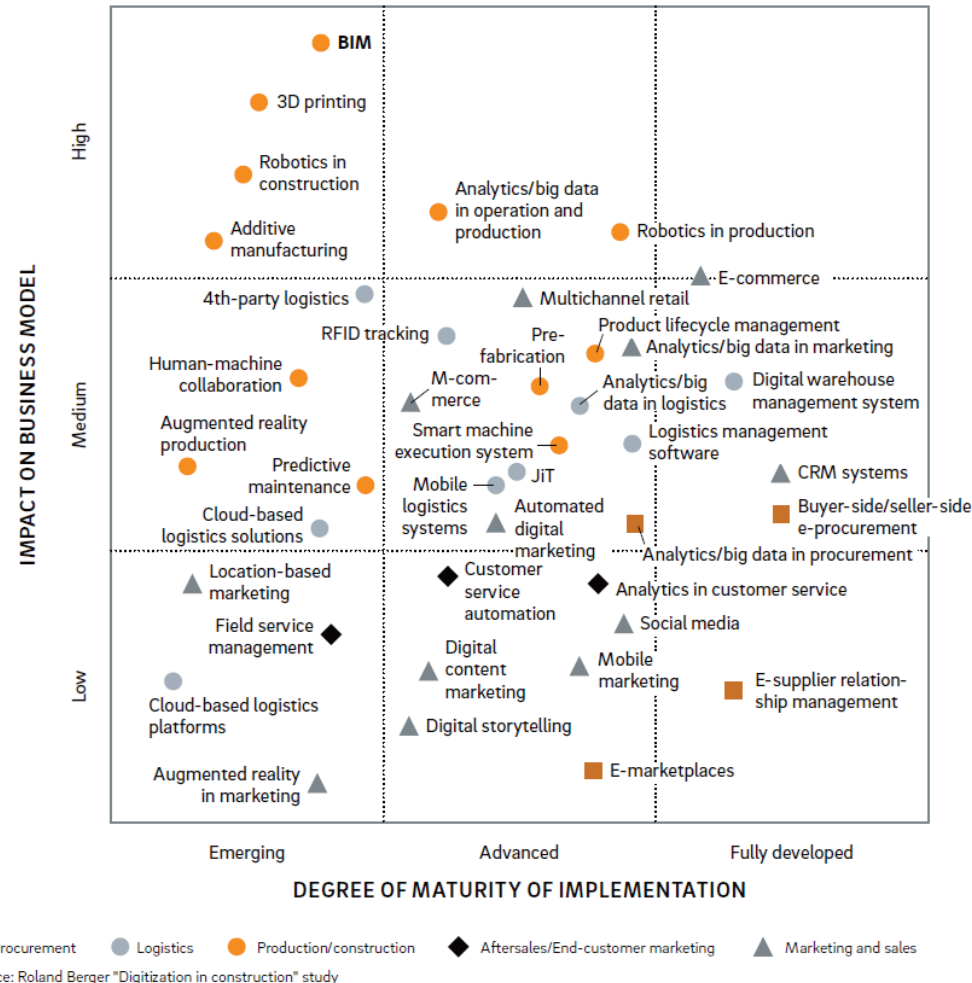
Biobased-, Bionic-, Programmable Composite Materials, New Insulation

NEW WORK

Activity Based Working, Open Office, Work 4.0

SAFETY & RESILIENCE

Hochwasserschutz, Erdbeben, IT Sicherheit



SMART BUILDINGS

Smart Home, Smart Cities, Smart Grids, Smart Buildings, Smart Infrastructure, Smart Transportation, Smart Manufacturing, Smart Agriculture, Smart Energy, Smart Water, Smart Waste, Smart Security, Smart Health, Smart Education, Smart Retail, Smart Travel, Smart Living, Smart Work, Smart Play, Smart Learn, Smart Grow, Smart Create, Smart Connect, Smart Share, Smart Collaborate, Smart Innovate, Smart Transform, Smart Evolve, Smart Adapt, Smart Survive, Smart Thrive, Smart Flourish, Smart Prosper, Smart Succeed, Smart Achieve, Smart Fulfill, Smart Realize, Smart Dream, Smart Hope, Smart Believe, Smart Trust, Smart Love, Smart Care, Smart Support, Smart Help, Smart Assist, Smart Guide, Smart Inspire, Smart Motivate, Smart Encourage, Smart Empower, Smart Enable, Smart Empower, Smart Enable, Smart Empower, Smart Enable



Smart Manufacturing, Smart Agriculture, Smart Energy, Smart Water, Smart Waste, Smart Security, Smart Health, Smart Education, Smart Retail, Smart Travel, Smart Living, Smart Work, Smart Play, Smart Learn, Smart Grow, Smart Create, Smart Connect, Smart Share, Smart Collaborate, Smart Innovate, Smart Transform, Smart Evolve, Smart Adapt, Smart Survive, Smart Thrive, Smart Flourish, Smart Prosper, Smart Succeed, Smart Achieve, Smart Fulfill, Smart Realize, Smart Dream, Smart Hope, Smart Believe, Smart Trust, Smart Love, Smart Care, Smart Support, Smart Help, Smart Assist, Smart Guide, Smart Inspire, Smart Motivate, Smart Encourage, Smart Empower, Smart Enable



SMART CITIES

Smart Home, Smart Cities, Smart Grids, Smart Buildings, Smart Infrastructure, Smart Transportation, Smart Manufacturing, Smart Agriculture, Smart Energy, Smart Water, Smart Waste, Smart Security, Smart Health, Smart Education, Smart Retail, Smart Travel, Smart Living, Smart Work, Smart Play, Smart Learn, Smart Grow, Smart Create, Smart Connect, Smart Share, Smart Collaborate, Smart Innovate, Smart Transform, Smart Evolve, Smart Adapt, Smart Survive, Smart Thrive, Smart Flourish, Smart Prosper, Smart Succeed, Smart Achieve, Smart Fulfill, Smart Realize, Smart Dream, Smart Hope, Smart Believe, Smart Trust, Smart Love, Smart Care, Smart Support, Smart Help, Smart Assist, Smart Guide, Smart Inspire, Smart Motivate, Smart Encourage, Smart Empower, Smart Enable

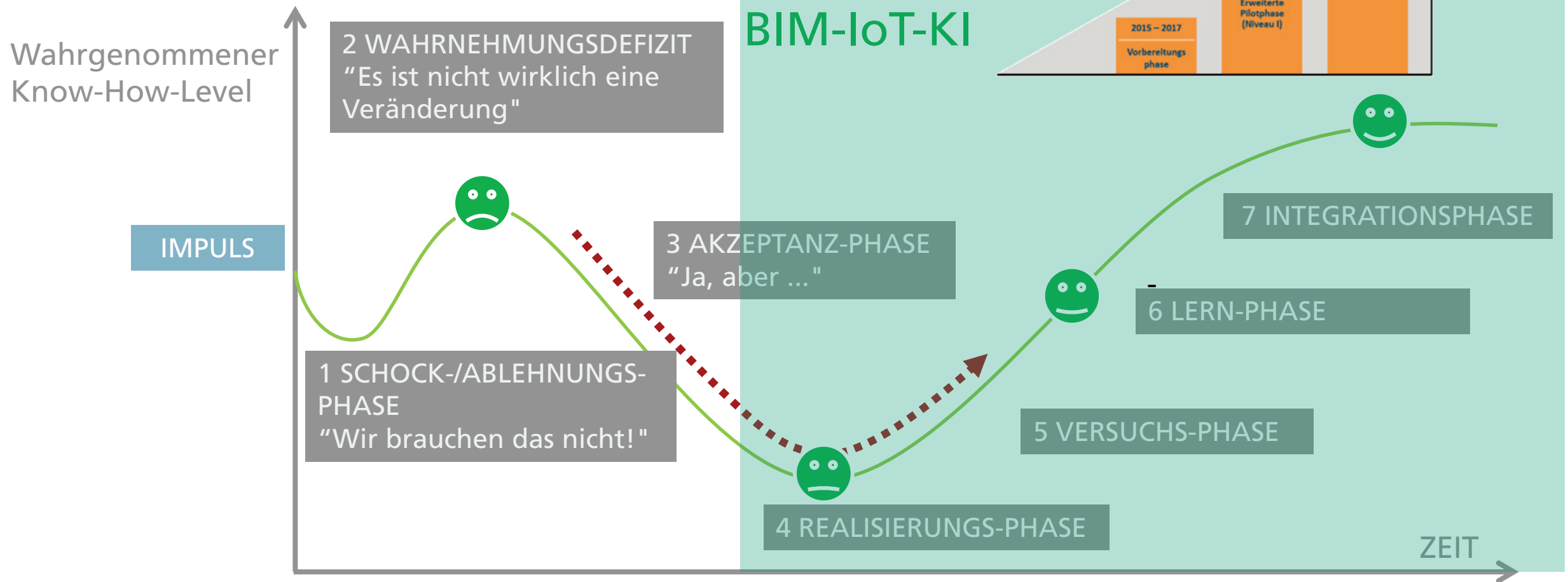


SMART INFRASTRUCTURE

Smart Home, Smart Cities, Smart Grids, Smart Buildings, Smart Infrastructure, Smart Transportation, Smart Manufacturing, Smart Agriculture, Smart Energy, Smart Water, Smart Waste, Smart Security, Smart Health, Smart Education, Smart Retail, Smart Travel, Smart Living, Smart Work, Smart Play, Smart Learn, Smart Grow, Smart Create, Smart Connect, Smart Share, Smart Collaborate, Smart Innovate, Smart Transform, Smart Evolve, Smart Adapt, Smart Survive, Smart Thrive, Smart Flourish, Smart Prosper, Smart Succeed, Smart Achieve, Smart Fulfill, Smart Realize, Smart Dream, Smart Hope, Smart Believe, Smart Trust, Smart Love, Smart Care, Smart Support, Smart Help, Smart Assist, Smart Guide, Smart Inspire, Smart Motivate, Smart Encourage, Smart Empower, Smart Enable

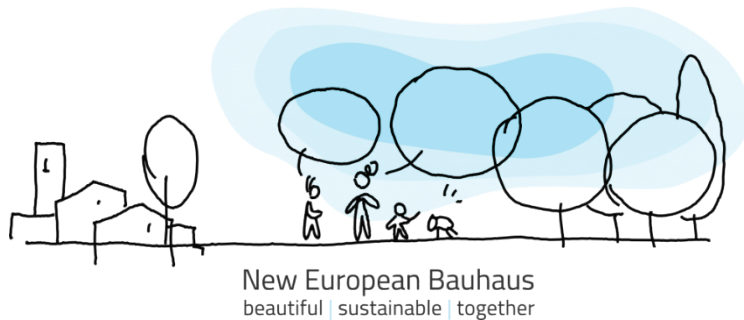


DIGITALISIERUNG DER BAUWIRTSCHAFT WO STEHEN WIR?

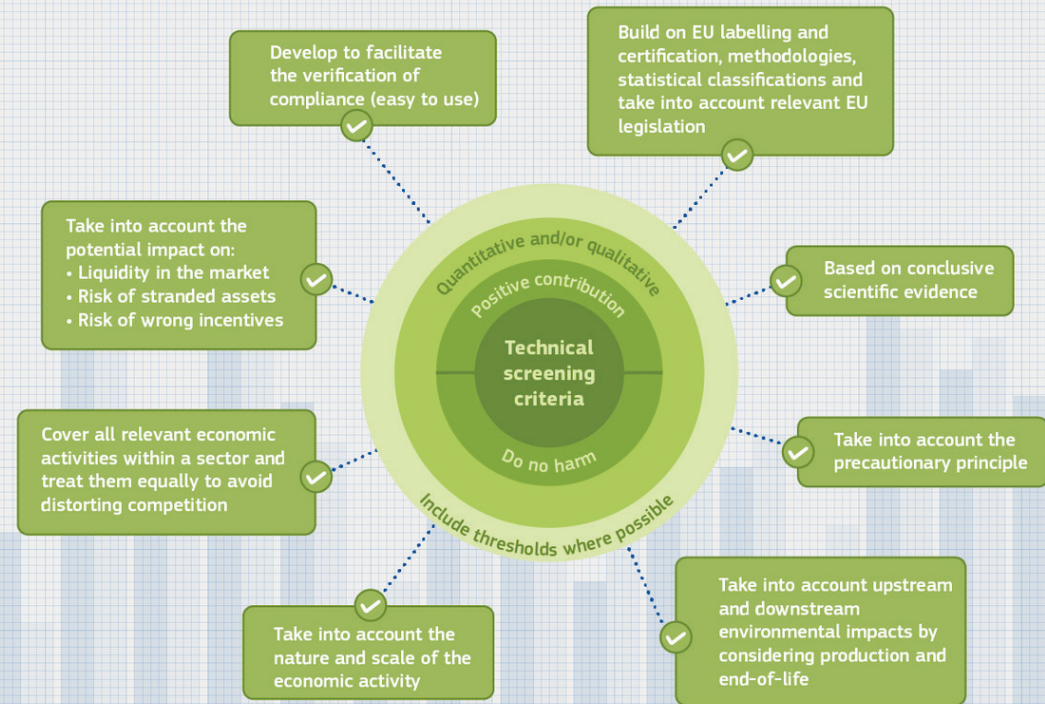


NEUE TREIBER

SUSTAINABLE FINANCE – ESG - SDG



EU taxonomy: Determining sustainable economic activities

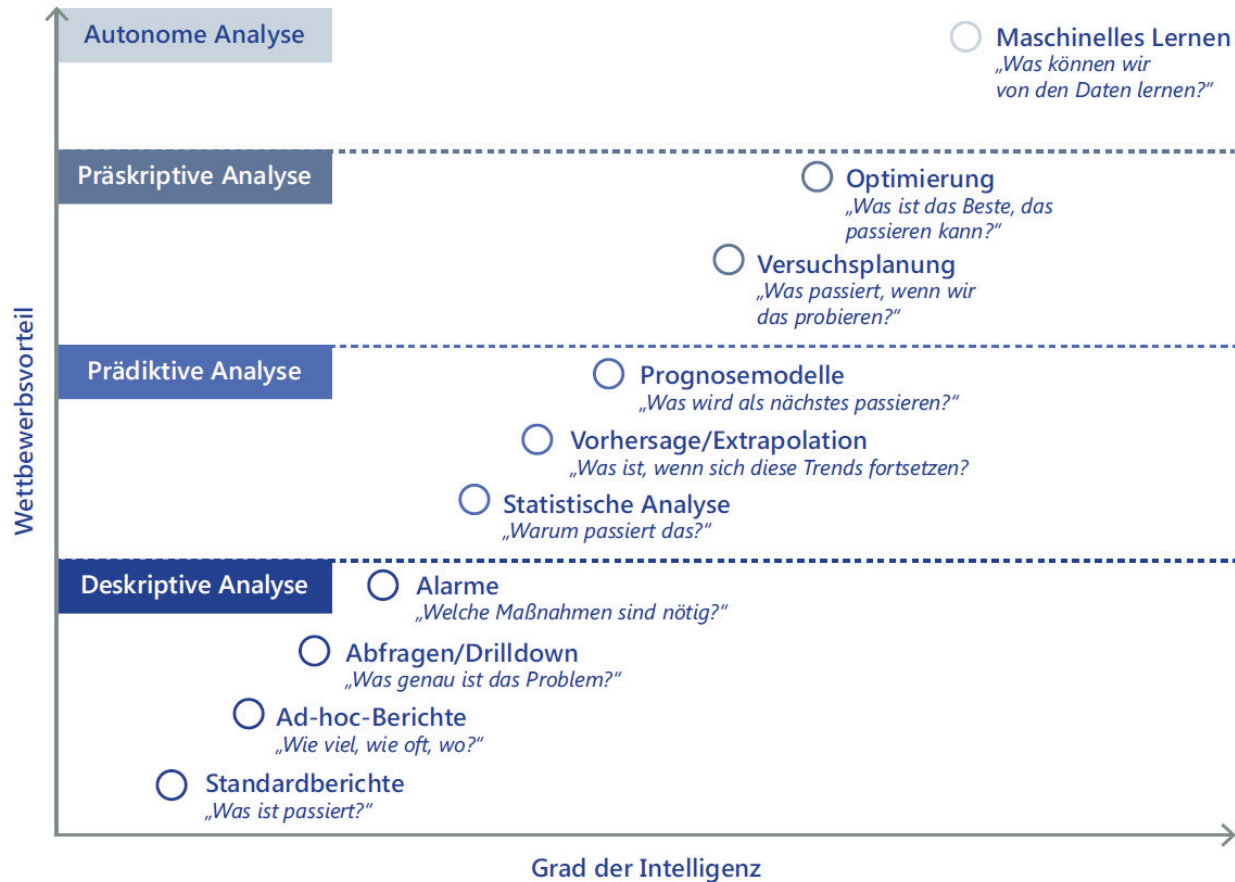


#SustainableFinanceEU

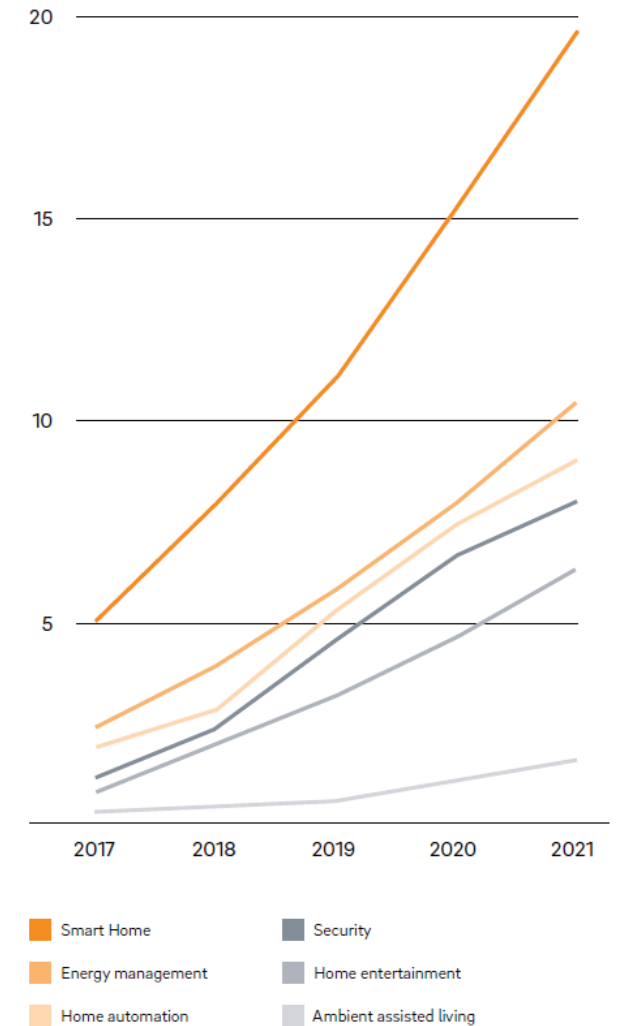


TRENDS

HYPE CYCLE FOR ARTIFICIAL INTELLIGENCE

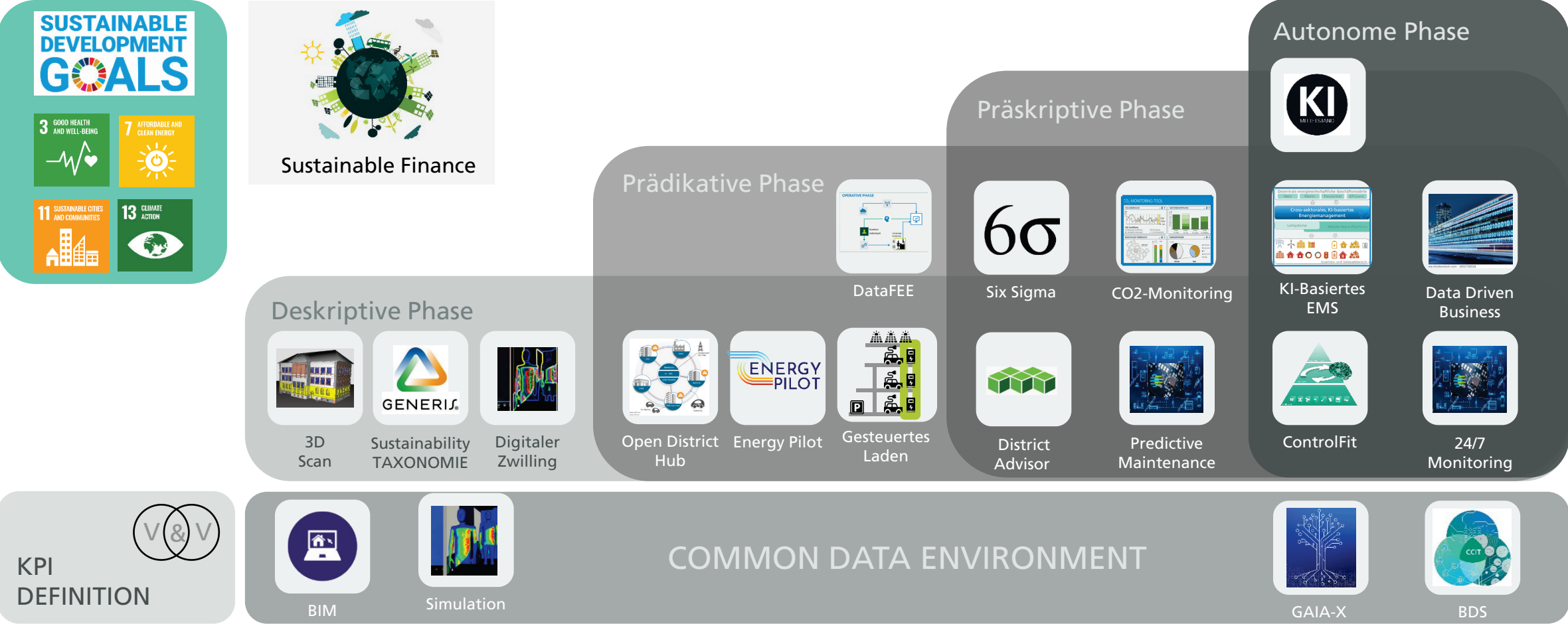


Quelle: Davenport, Harris: The new Science of Winning, Harvard Business School Publishing Cooperation, 2017



FUTURE TRENDS

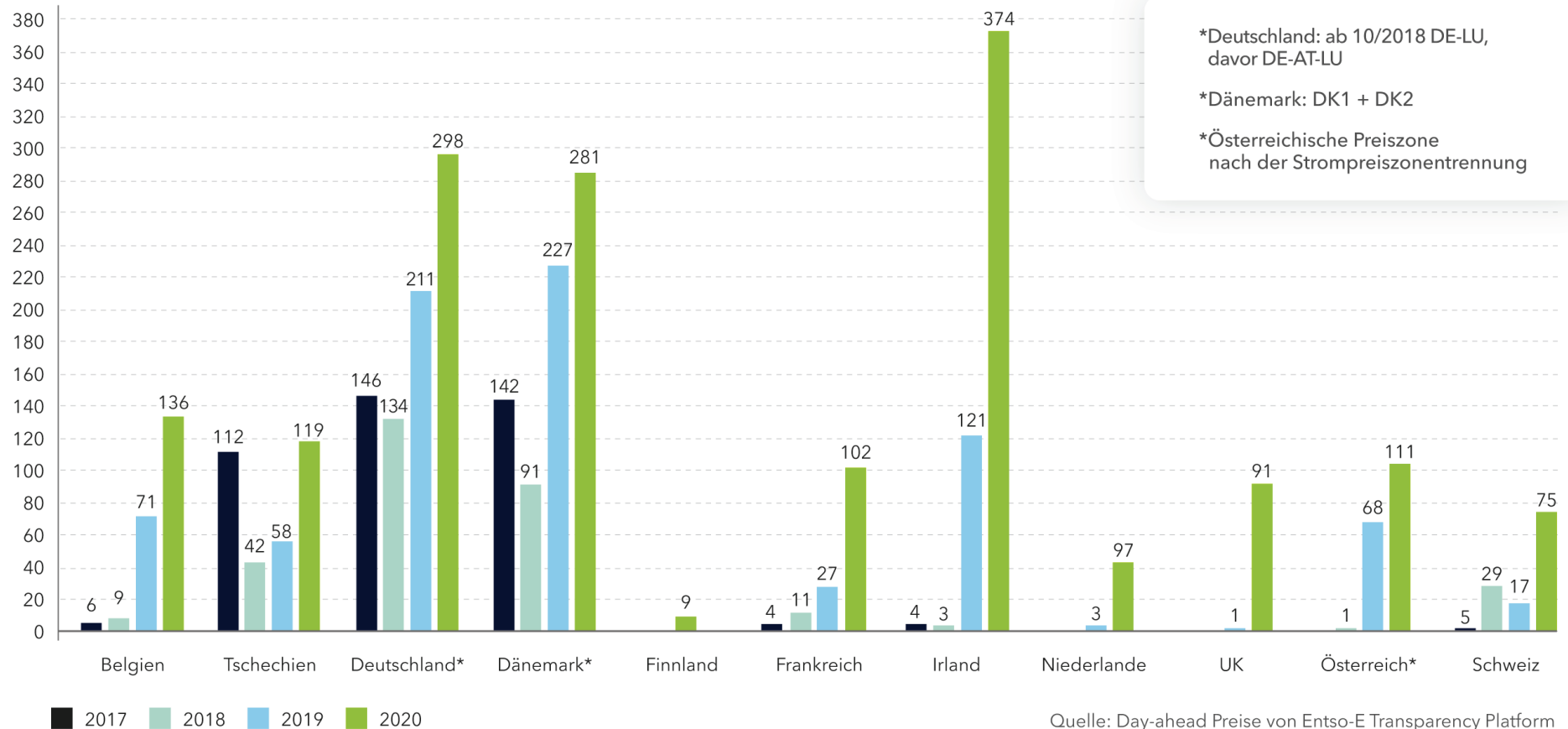
AUF DEM WEG ZUM DATA DRIVEN BUSINESS



FUTURE TRENDS

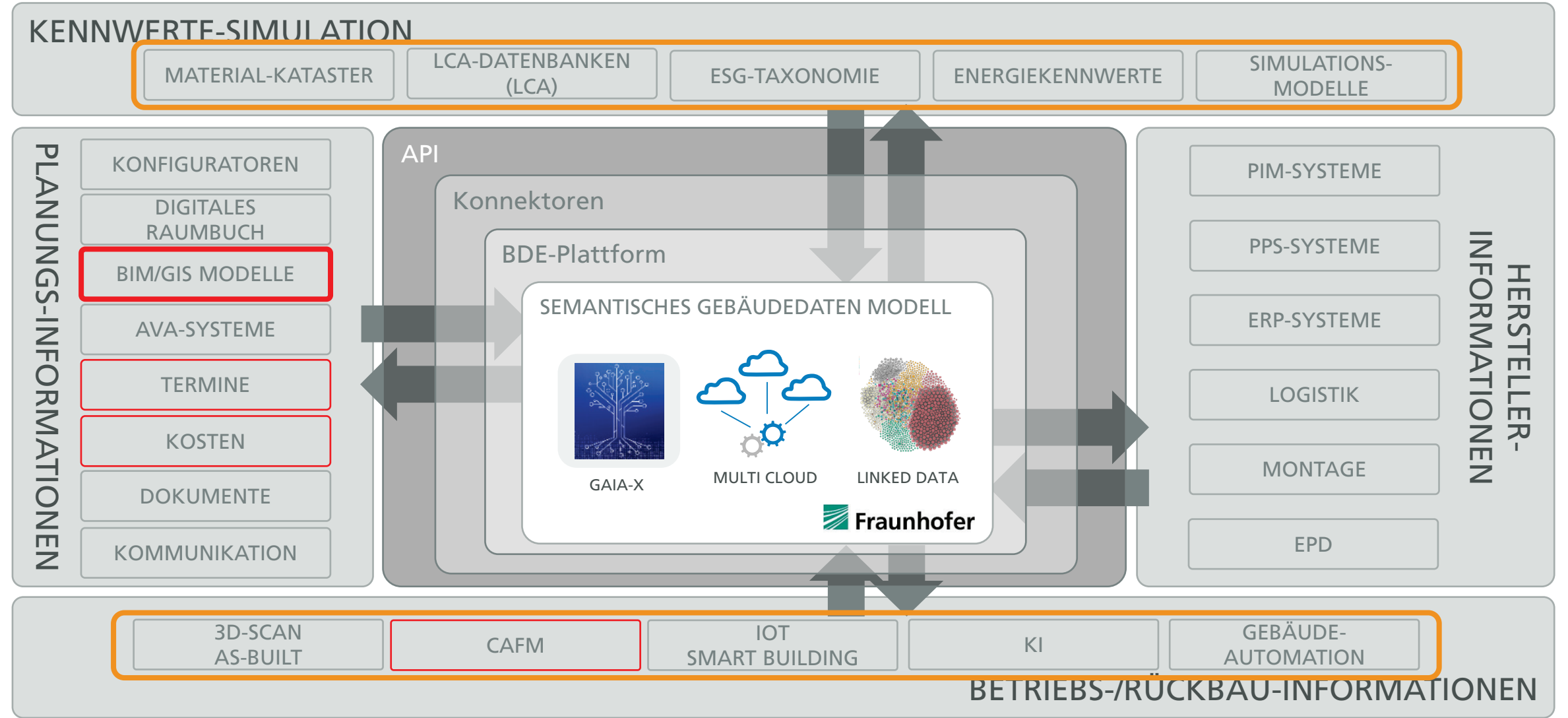
KOSTENPOSITIVER BETRIEB

Anzahl der Stunden mit negativen Strompreisen in Europa



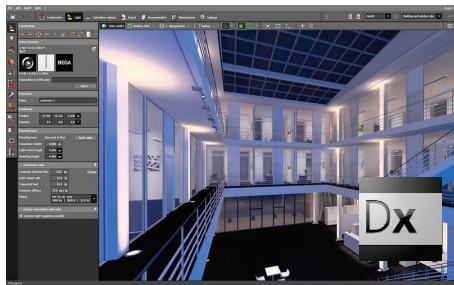
FUTURE TRENDS

SUSTAINABLE BUILDING DATA ENVIRONMENT (SBUILD)



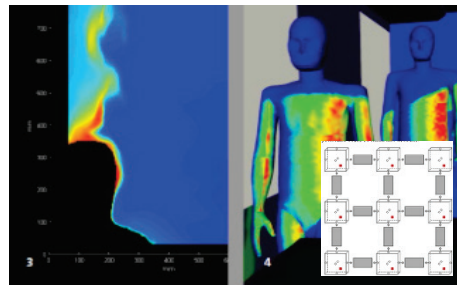
DIGITALE ZWILLINGE WIRKMODELLE

DIGITALE ZWILLINGE



Licht

Dialux®



Raumklima Behaglichkeit

VEPZO - IESS



Energieeffizienz Hygrothermik

WUFI® - 18599 Kernel



Umweltwirkung ESG

Generis®



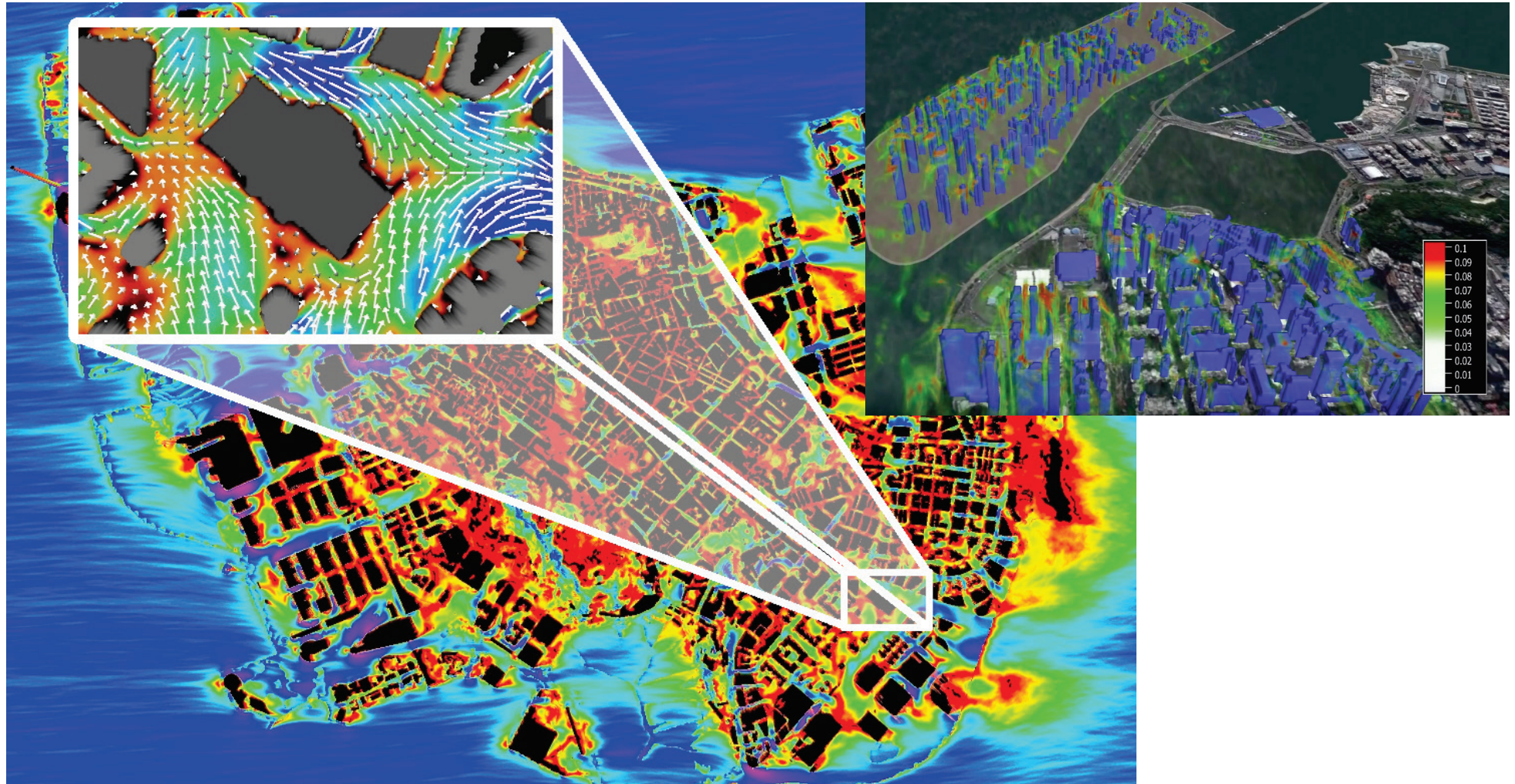
TGA

Modelica®



REAL LABOR

DIGITALE ZWILLINGE WIRKMODELLE - STADT

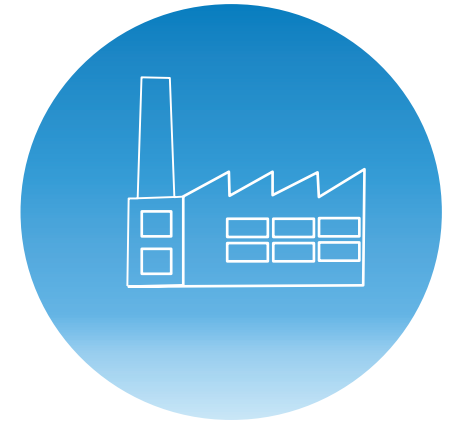




Lösung



Implementierung



LÖSUNG REAL-LABOR

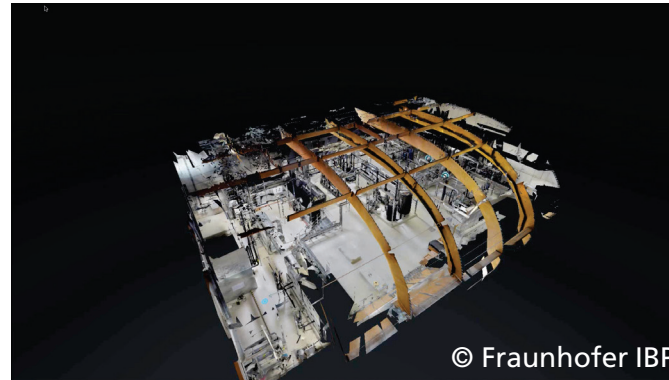
Plattformen für Planen und Betreiben



Entwicklungszentrum Bestand 4.0 Benediktbeuern



- Digitale Erfassung (3D-Scan, Photogrammetrie)
- Forschungsprojekte
- Demonstratoren-Veranstaltungen



Digitale Kommunikation



- Zentrum Virtuelles Engineering (ZVE)
- Elbedome (360° Cave)
- Virtual-, Augmented- und Mixed Reality



FRAUNHOFER REALITY LABS

Digitale Zwillinge und modulares Bauen



MEP-/IoT-Experience Lab



- Modulplattform energieeffiziente technische Gebäudeausrüstung (MEGA)
- IoT-Experience-Lab

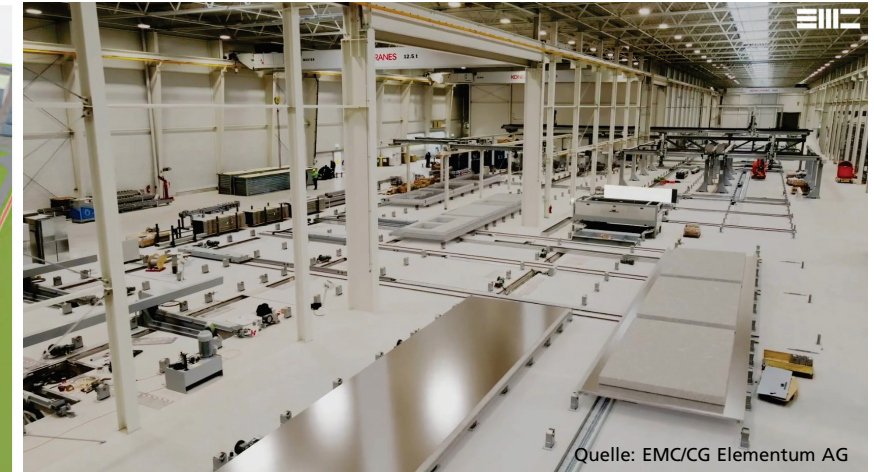


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Forschungsfabrik BAU (in Planung)



- Vorfertigungsprozesse
- Vernetzte Produktion
- Digitale Prozessketten
- Digitale Zwillinge und Virtual Engineering
- IoT und KI Methoden



VIELEN DANK!