BASF

We create chemistry

Sustainability drivers for business transformation

Insights from experts

EDITORIAL

Only in a collaborative world will we succeed in achieving the 2030 Sustainable Development Goals. We expect industries and companies to use market dynamics to deliver sustainable solutions, competing on cutting-edge technologies to win the trust of customers by generating value for society.

For companies such as BASF it is important to understand which sustainability-related trends and standards will shape the future. Based on these insights, we can formulate strategies accordingly, managing risks and seizing opportunities to generate value for society. Together with the management consultancy A.T. Kearney, sustainable natives and Impact Hub Berlin, we have asked a crowd of sustainability experts and practitioners from around the world to answer questions about upcoming trends and standards. How can industries transform towards sustainability – economically, socially and environmentally – by 2030?

The answers are concrete, regionally-diverse and industry-specific. The study investigates what, where and how fast these changes will come into effect for the seven industries covered in this study. It also reveals what companies need to do from the inside to be successful. Top of the list: "it's the culture, stupid!". Having the right values and mindset will decide whether a company's transformation is a success or not. Far more important than indicators, digital capabilities or colorful reports.

A lot needs to be done for the transformation ahead. And we – companies, entrepreneurs, consultants, NGOs, experts, politicians, investors, creatives around the world – can do it. Combining our forces, we can create a better future for our societies.

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CASE FOR CHANGE

## The next pathways towards sustainability

Change is unstoppable and holds new opportunities when actively shaped.
The case for sustainable transformation means massive change as well as massive new opportunities.
Navigating the transformation pathway becomes a matter of survival for companies and societies.
A global crowd of sustainability experts provides signposts on the "how".

NEW IMPERATIVE

Our world is changing constantly. We are facing existential challenges for a more livable and sustainable future. Towards 2050, several megatrends will trigger changes in our societal, environmental and economic systems: projected population growth towards 10 billion people, a doubling of per capita income and close to 70% urbanization with more than another billion people moving to cities will drive this unprecedented growth. Needs and demand for housing, food, mobility and further products and services as a consequence will increase dramatically. As we are already overstepping planetary boundaries, regional and global challenges are imposing themselves: climate change, over-use of resources, elimination of ecosystems as well as a social divide with millions still living in poverty. Therefore, we need to transform fast, because time is pressing and sustainable solutions are becoming increasingly imperative, whilst also opening up new opportunities.

The 17 Sustainable Development Goals (SDGs) of the United Nations for 2030 provide us with an internationally agreed compass with a clear timeline. They prioritize action fields and targets we have to work on and reach for sustainable living – for all people, in all regions of the world.
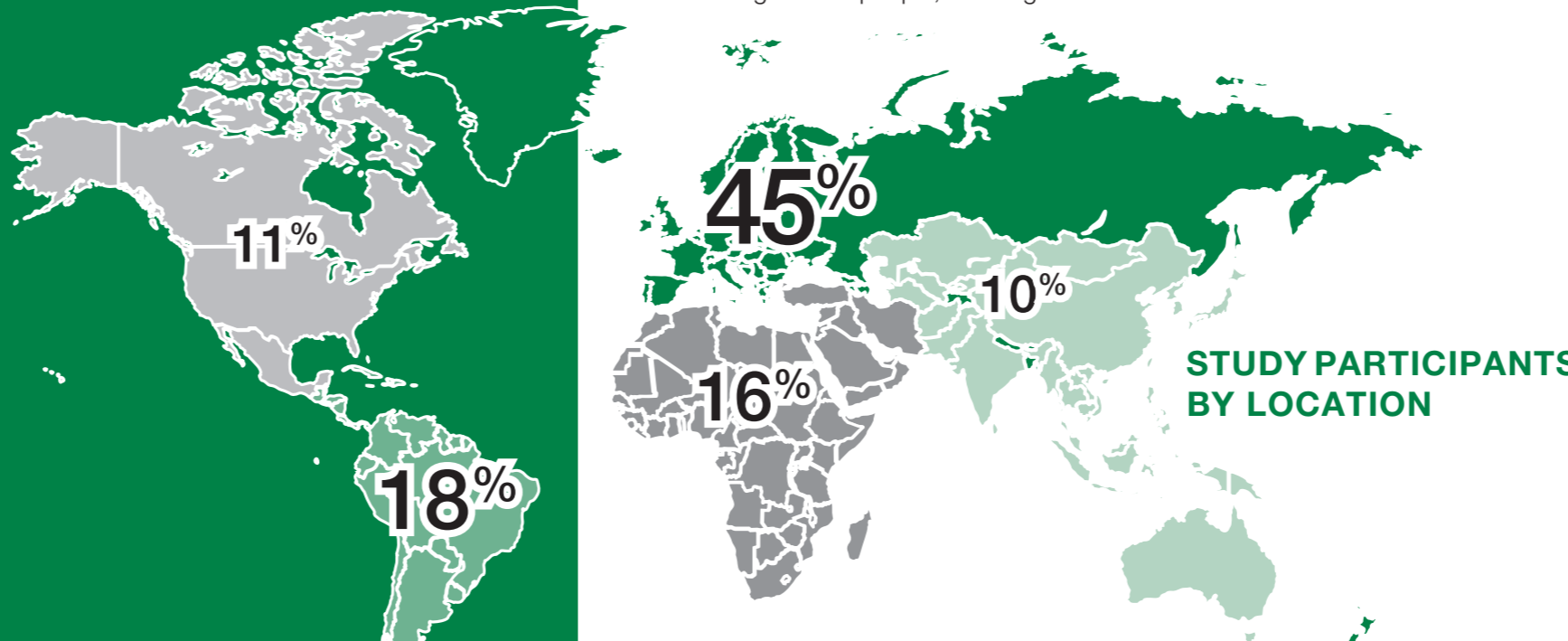
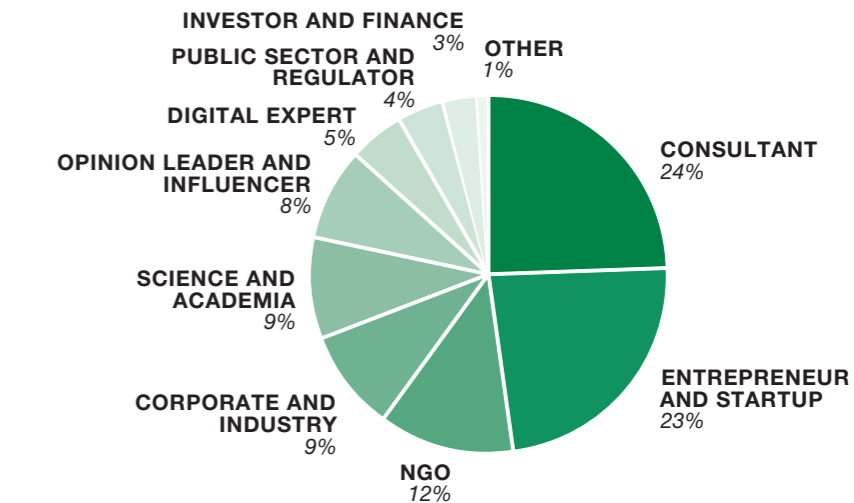The big question is now: How to reach these global goals?

WE WANTED TO KNOW:

- What are the trends and standards that will drive this sustainable transformation in the next decade towards 2030 in specific industries and regions?
- Which capabilities will companies need to develop to be successful in this transformation?

QUESTIONS THAT CALL FOR THE CROWD

In order to find answers to these crucial questions, we conducted a global sustainability study. We asked a global and diverse crowd of sustainability experts for their perspective and prognoses on upcoming trends and standards in seven different industries. We can now draw a more detailed picture of this so-called "sustainable transformation".

11%

45%

10%

16%

18%

STUDY PARTICIPANTS BY LOCATION

STUDY PARTICIPANTS BY ROLE

INVESTOR AND FINANCE
3%
OTHER
1%

PUBLIC SECTOR AND REGULATOR
4%

DIGITAL EXPERT
5%

OPINION LEADER AND INFLUENCER
8%

SCIENCE AND ACADEMIA
9%

CORPORATE AND INDUSTRY
9%

NGO
12%

CONSULTANT
24%

ENTREPRENEUR AND STARTUP
23%

7 INDUSTRIES, OVER 60 TRENDS AND 210 STANDARDS

The transformation becomes tangible when broken down to specific industries, trends and standards. We have a more concrete understanding of how the transformation can be conducted towards 2030. More than 480 surveys as well as 30 high-level deep-dive interviews generated more than 9,000 data points. In particular, we looked at the following industries:

- Agriculture & Food
- Automotive & Transportation
- Consumer Goods & Retail
- Energy & Utilities
- Engineering & Construction
- High Tech & Electronics
- Pharma & Health

DESIGN OF THE STUDY

The first part of the study focuses on identifying trends and standards which are impactful enough to drive sustainable transformation in the industries. A set of more than 70 trends and over 210 standards were generated based on research from over 900 studies by academia, think tanks and market analysts. Trends in this study are general developments in a specific industry. A standard operationalizes a trend into market realities, for instance new government regulation, voluntary industry standards or technological standards.
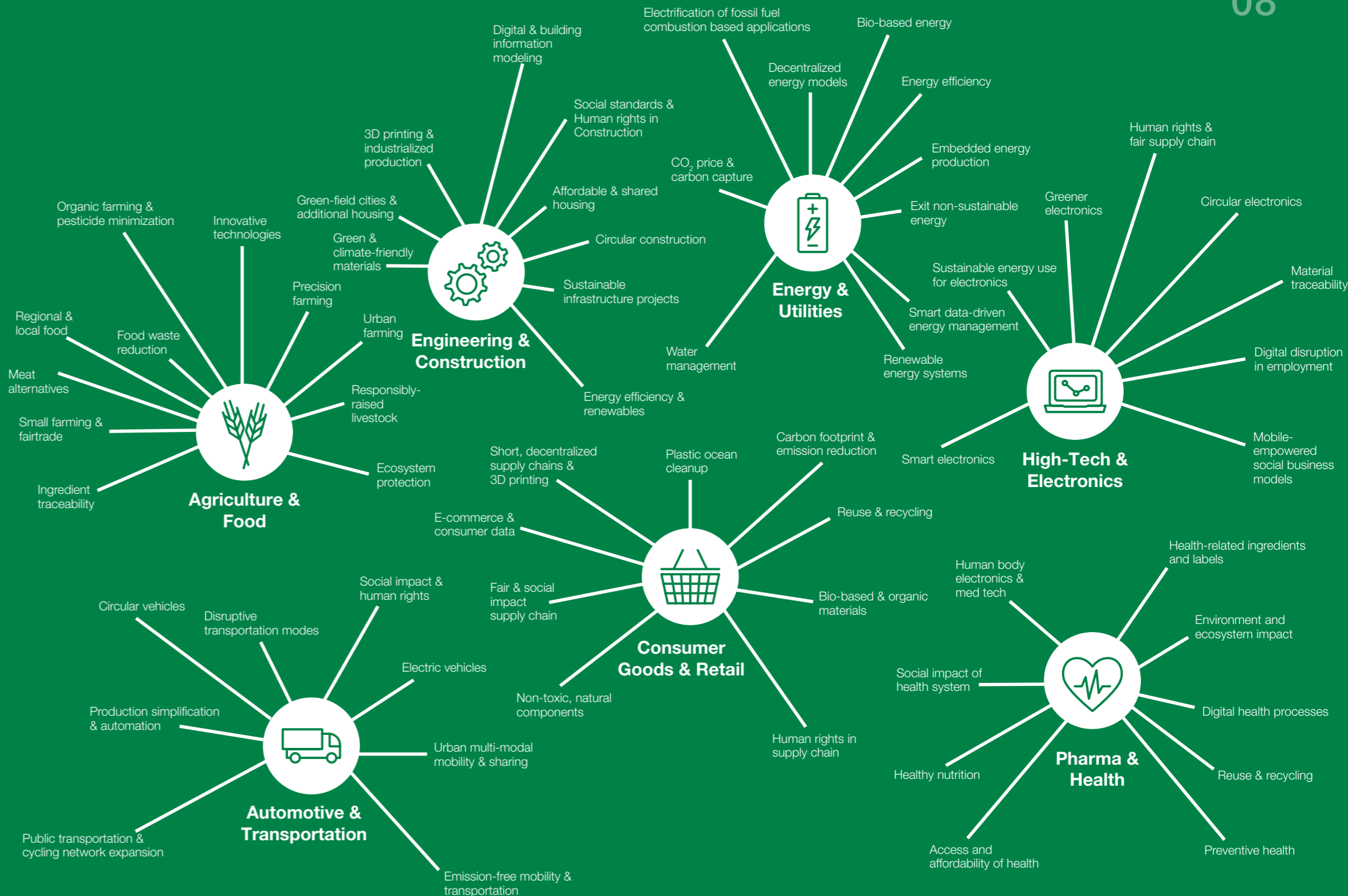
KEY FINDINGS

The answers are concrete and industry-specific: whereas the Automotive and Transportation industry depends heavily on going emission-free and solving the urban mobility challenge, the High Tech and Electronics industry is expected to use digital solutions for empowering people and businesses. Above all, two industries are the focus of this transition: Agriculture and Food as well as Energy and Utilities. The agriculture sector will fundamentally change thanks to new technologies, such as precision and digital farming, as well as moving away from a widespread use of pesticides towards more organic farming. The energy sector will shift away from fossil fuels towards a new energy world built on renewable energy, decentralized structures and smart grid and storage solutions.

> "Growth should be finally defined in more qualitative than quantitative terms."
> Sustainability expert in Consumer Goods & Retail industry (China)

> "A new paradigm will gain the upper hand: meaning that increasing positive impact instead of avoiding and reducing negative impact will matter."
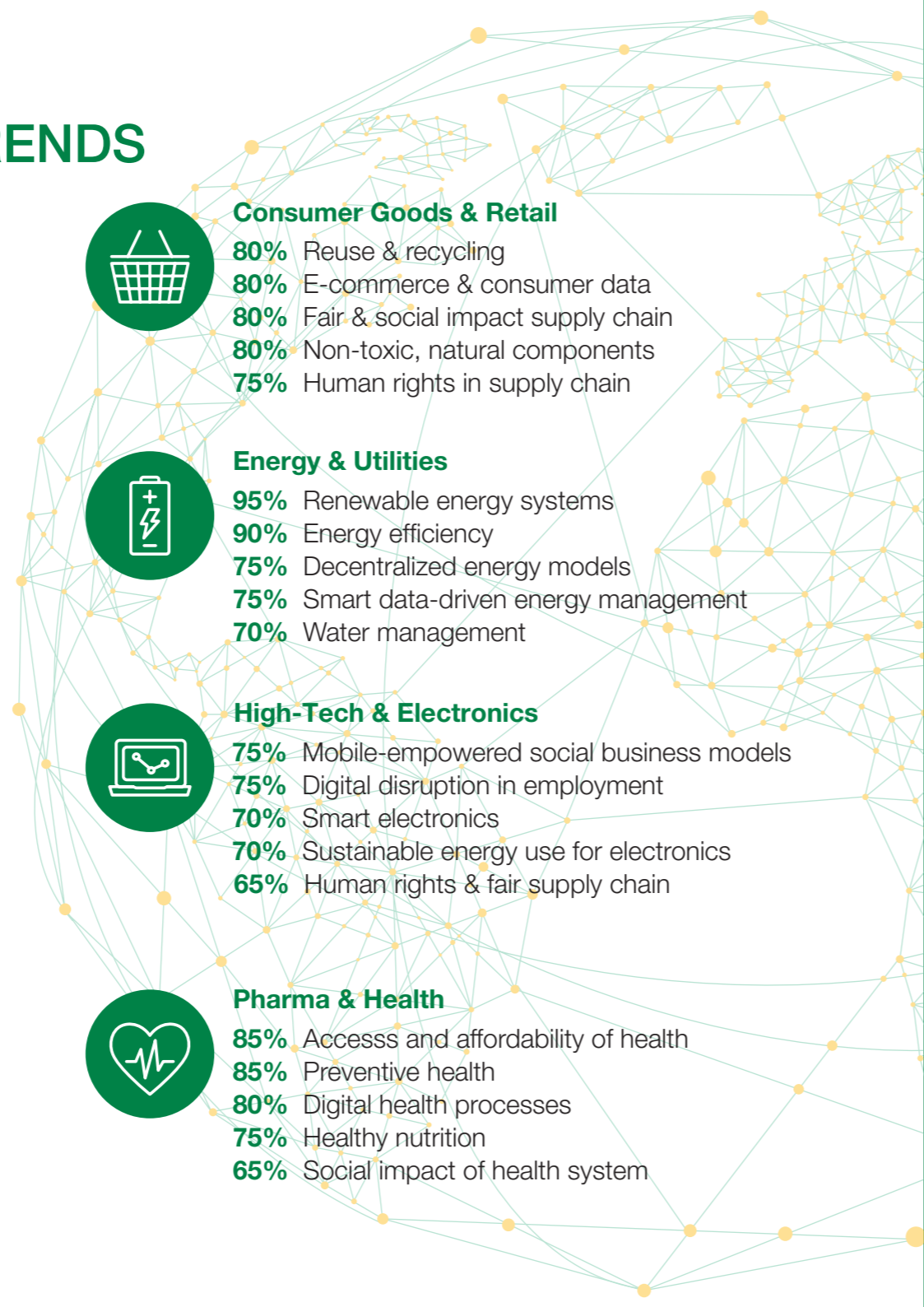> Sustainability expert in Agriculture & Food industry (USA)

Agriculture & Food
- Organic farming & pesticide minimization
- Innovative technologies
- Regional & local food
- Food waste reduction
- Precision farming
- Urban farming
- Meat alternatives
- Small farming & fairtrade
- Ingredient traceability
- Responsibly-raised livestock
- Ecosystem protection

Engineering & Construction
- Digital & building information modeling
- 3D printing & industrialized production
- Green-field cities & additional housing
- Green & climate-friendly materials
- Social standards & Human rights in Construction
- Affordable & shared housing
- Circular construction
- Sustainable infrastructure projects
- Water management
- Energy efficiency & renewables

Energy & Utilities
- Electrification of fossil fuel combustion based applications
- Bio-based energy
- Decentralized energy models
- Energy efficiency
- CO_2 price & carbon capture
- Embedded energy production
- Exit non-sustainable energy
- Sustainable energy use for electronics
- Smart data-driven energy management
- Renewable energy systems

High-Tech & Electronics
- Human rights & fair supply chain
- Greener electronics
- Circular electronics
- Material traceability
- Digital disruption in employment
- Mobile-empowered social business models
- Smart electronics
- Carbon footprint & emission reduction
- Reuse & recycling

Consumer Goods & Retail
- Plastic ocean cleanup
- E-commerce & consumer data
- Short, decentralized supply chains & 3D printing
- Fair & social impact supply chain
- Bio-based & organic materials
- Non-toxic, natural components
- Human rights in supply chain

Automotive & Transportation
- Circular vehicles
- Disruptive transportation modes
- Social impact & human rights
- Electric vehicles
- Production simplification & automation
- Urban multi-modal mobility & sharing
- Public transportation & cycling network expansion
- Emission-free mobility & transportation

Pharma & Health
- Health-related ingredients and labels
- Human body electronics & med tech
- Environment and ecosystem impact
- Social impact of health system
- Digital health processes
- Healthy nutrition
- Access and affordability of health
- Reuse & recycling
- Preventive health

CROSS-REGIONAL TOP FIVE TRENDS

Sustainability experts all over the globe were asked to rank various sustainability trends by the relevance for their industry and region. The following trends were shown to have high to very high relevance, cross-regionally, for the seven industries selected in the survey, making a top five ranking possible.

Consumer Goods & Retail
80% Reuse & recycling
80% E-commerce & consumer data
80% Fair & social impact supply chain
80% Non-toxic, natural components
75% Human rights in supply chain

Engineering & Construction
95% Energy efficiency & renewables
90% Green & climate-friendly materials
80% Sustainable infrastructure projects
75% Digital & building information modeling
75% Affordable & shared housing

Energy & Utilities
95% Renewable energy systems
90% Energy efficiency
75% Decentralized energy models
75% Smart data-driven energy management
70% Water management

Agriculture & Food
85% Regional & local food
80% Ecosystem protection
80% Innovative technologies
75% Organic farming & pesticide minimization
75% Food waste reduction
75% Small farming & fair trade

High-Tech & Electronics
75% Mobile-empowered social business models
75% Digital disruption in employment
70% Smart electronics
70% Sustainable energy use for electronics
65% Human rights & fair supply chain

Automotive & Transportation
90% Emission-free mobility & transportation
80% Public transportation & cycling network expansion
80% Urban multi-modal mobility & sharing
75% Electric vehicles
55% Production simplification & automation

Pharma & Health
85% Accesss and affordability of health
85% Preventive health
80% Digital health processes
75% Healthy nutrition
65% Social impact of health system

Values rounded to 5% steps

CRITICAL JUNCTURES

If experts ranked a trend as high to very high for their region and industry, they were then asked in a second step to evaluate trend-specific standards with regard to their potential impact, the period when they might become effective and the triggering stakeholder.

The standards below are derived from some of the top-ranked global trends and identified as becoming effective cross-regionally from now until 2020. They represent some examples of critical junctures for a sustainable transformation in the selected industries.

WHO TRIGGERS THESE TRENDS?
Triggers come from stakeholders, such as:
Business: industry initiative, dominant company, innovator/startup, investor
Public: government, standard institution
Civil: NGOs/activists, consumer pressure

TRIGGER
business

Standard:
Mobile banking in low-income countries
Trend (75%): Mobile-empowered social business models

Standard: Large-scale renewable energy projects
Trend (95%): Renewable energy systems

Standard:
Regional Food Label
Trend (85%): Regional & local food

Standard:
**Fair-/social standards certification
for companies and products**
Trend (80%): Fair & social impact supply chain

public

Standard:
Responsible consumer data usage and data protection
Trend (80%): E-Commerce & consumer data

Standard:
Limiting water pollution
Trend (80%): Ecosystem protection

civil

INSIGHTS BY REGION

FAIR SUPPLY CHAINS IN AFRICA AND MIDDLE EAST

Over 60% of experts for the Food & Agriculture industry in Africa and the Middle East identified empowerment of, as well as direct collaboration with, small farmers as 'high impact standards', becoming effective now and triggered by various actors. According to the regional experts, social and human rights as well as inclusive trade tariffs are starting to have a high impact on the industry. Ending human rights violations in supply chains was also evaluated as high impact for almost all other industries in the region. Here, governments, NGOs and activists were identified as major triggers for most industries in terms of social standards in the supply chain, such as human rights due diligence or corporate liability for human rights violations. Fair supply chains in Africa and the Middle East are soon expected to become a high impact standard due to emerging regulatory frameworks in several industries. Not complying with these frameworks represents a high risk. In comparison, first movers can take a leading role in creating social impact along their supply chain and in differentiating themselves in the market.

CIRCULAR ECONOMY IN EUROPE

According to 55% of experts for the Consumer Goods & Retail industry in Europe, reduction and the limitation of plastics in packaging will have a high impact from now until 2020, triggered by various actors with governments in the leading role. In the Construction & Engineering industry, closed-loop buildings by design, the reuse of building materials facilitated by 'material banks' or the use of recycled materials will likewise have a high impact as perceived by study participants. In contrast, disruptive standards in the Automotive & Transportation as well as High-Tech & Electronics industry, such as modular vehicle design or 'circular-by-design' electronics, are mostly not expected to become effective before 2025. In these industries, public regulators or pressure from consumers, NGOs and activists are not trusted to trigger high impact standards in the coming years according to most experts, indicating regulatory failure and a lack of social awareness in Europe.

WATER PROTECTION IN NORTH AMERICA

The political turnaround on environmental topics in the United States of America is creating visible uncertainties. This is reflected in the different expectations of the sustainability experts on high impact standards, such as water irrigation standards in the Agriculture & Food industry or sustainable water management infrastructure in the Energy & Utilities industry, and on when they will become effective. Most experts believe that governments will trigger these high impact standards, but not before 2020 and 2025 respectively. However, state of the art technologies, such as precision drones, machine learning and blockchain are expected to also be used to preserve and protect water in the next years, representing clear business opportunities.

AGRICULTURAL TRANSITION IN LATIN AMERICA

Agriculture experts identified ecosystem protection, precision farming as well as regional and local food as leading ecological trends in the Agriculture & Food industry in Latin America from now until 2020. In this period, governments are expected to trigger high impact standards like limitation of water pollution, whereas other impactful standards such as drone technologies for precise monitoring, water dosing or fertilizer usage are mainly triggered by business actors. The trend of regional and local food in the industry goes hand in hand with community supported agriculture. This growing social aspect in the Agriculture & Food industry in Latin America is in line with other high impact standards, such as social and human rights enforcement in farming as well as direct collaboration with, and empowerment of, small farmers. Although disruptive standards, such as sustainable commodity standards for limiting deforestation as well as usage of pesticides and fertilizer are not expected to be effectively triggered by public or civil actors before 2025, several impactful standards are already starting to change the Agriculture & Food industry in Latin America.

CLIMATE CHALLENGE FOCUS IN ASIA PACIFIC

Climate change is a global challenge. In the Asia Pacific region, there is a strong focus on the topic according to study experts. Around 60% of the industry experts in the Energy & Utilities industry in Asia Pacific expect energy efficiency in public, civil and industry sectors to be a high impact standard becoming effective now or by 2020. The same applies to large-scale renewable energy projects and renewable energy transition roadmaps. All these standards are commonly triggered by various actors. CO_2 reduction in retail and logistics as well as CO_2 transparency for products as standards are perceived as high impact in the Asian Consumer Goods & Retail industry and mainly triggered by business actors. In the Automotive & Transportation industry high impact standards, such as public transportation and rail expansion, are instead triggered by governments. Although disruptive standards, like magnetic ground transportation, smart home technology and the exit from fossil fuels are not expected to become effective before 2025, Asia Pacific's role in fighting climate change is growing rapidly.

"IT'S THE CULTURE, STUPID!"

The last part of the study focuses on key capabilities large corporations need to develop and change for a sustainable transformation. In a first step, all experts had to identify the most important capability areas in order to explain in a next step how easy or difficult it will be for large corporations to develop them.
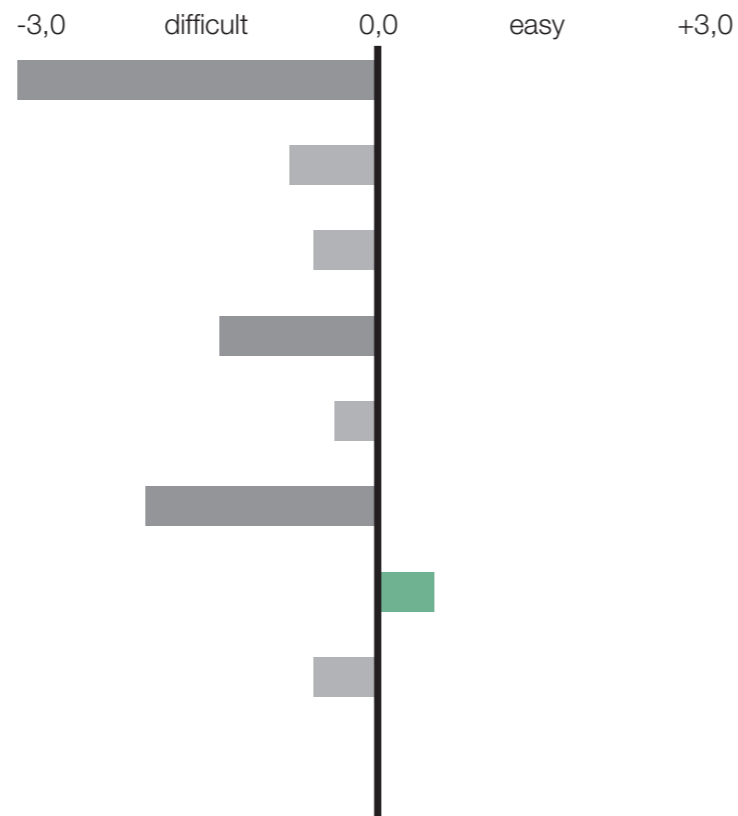
KEY CAPABILITIES TO TRANSFORM TOWARDS SUSTAINABILITY

Selection of key transformation capabilities

Ease of implementation

-3,0   difficult   0,0   easy   +3,0

- Cultural Transformation
- Sustainable Impact Innovation
- Stakeholder Management & Partnerships
- Strategy & Management
- Knowledge & Empowering
- Leadership & New Work
- Performance & Reporting
- Digital Competences & Capabilities
- Communication & Storytelling

Participants selected max. 3 key capabilities

Average evaluation for key capabilities from -5 to +5

THE IMPERATIVE FOR SUSTAINABLE TRANSFORMATION

We asked a global crowd of sustainability experts: "What do companies need to be successful for a sustainable transformation?" Top of the list of transformation capabilities, with more than 40% of experts selecting this, is cultural transformation, while sustainable impact innovation and stakeholder management and partnerships rank top second and third. When asked for rationales, experts commented that short-term profit and shareholder value maximization, the disregarding of externalities as well as hierarchical and inflexible organizational structures are major obstacles in the transformation. Shifting values and culture towards shared value creation, integrating sustainability into the core principles of business as well as redefining strategic goals and the meaning of 'productive work' are the most important cultural imperatives.

Therefore, a mindset shift is urgently required: from a defensive, risk minimizing and reactive to a proactive, opportunity-seeking, trend-setting and impact-oriented leadership approach. Against this backdrop, sustainability experts emphasize the role of sustainable impact innovations. Innovating for sustainability is essential to transform core business and companies substituting conventional 'old business' with sustainable 'new business' will have the best chances of success. In this context, stakeholder management and partnerships along the value chain become a core competence for companies, given that innovation challenges are too big for one company alone to be solved. In these partnerships, experts comment that it will be essential to share common sustainability objectives and professionally manage stakeholder relationships.

TEN TIMES INNOVATION

CONCLUSION: THE TIME TO SPEED UP IS NOW

The study reveals that specific sustainability trends and standards will change the industries under consideration. From now until 2020, high impact standards, such as large-scale renewable energy projects, mobile banking in low income countries as well as limiting water pollution, are globally expected to become effective in their respective industries. By looking at the triggers for these global high impact standards, it becomes clear that joint forces of public regulators with business and/or civil actors are at work, and that the regional relevance varies. Sustainability megatrends require progressive and smart government regulation on a large scale. According to the study results, this holds true in particular for the circular economy breakthrough in Europe and for reaching an extensive agricultural transition in Latin America. In addition, business actors are urgently called on to take leadership in implementing fair supply chains in Africa and the Middle East. In Asia Pacific, several industries are expected to be disrupted by renewable energy and energy efficiency standards triggered by various actors, illustrating the importance of common action in fighting climate change.
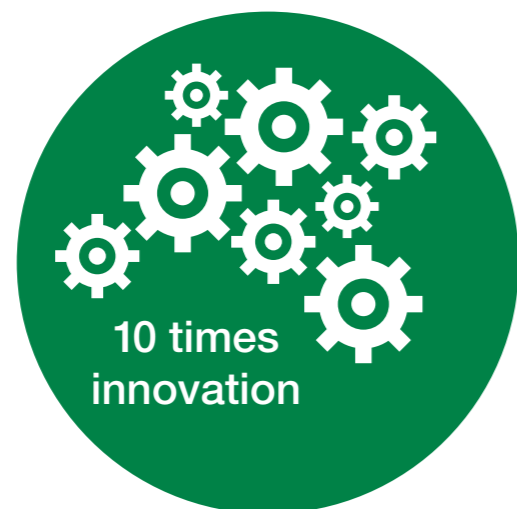
Thus, there are new imperatives for business to work on global solutions and rethink corporate culture. However, while all these pathways represent strong arguments for corporations to become frontrunners in regional or global transformation, an honest broker must conclude that current efforts for transformation and its rate of progress will not be enough to reach the global Sustainable Development Goals by 2030. If we want to remain within planetary boundaries while assuming population growth to 10 billion people with doubling of average per capita income to \$20K in 2050 as it is projected in most likely scenarios, we need to innovate by a factor of 10: Becoming 10 times more efficient in feeding the world population, mobility, housing, energy generation/use etc. The world needs smart government regulation, business leadership and civic courage to speed up the transformation. All actors need to collaborate across boundaries with a "10 times" level of magnitude, which will require cooperation and innovation on a level never previously achieved in human history.

10 times innovation