

Sustainability Business Trends

Key findings

www.basf.com

Note

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. The following document gives a summary of the key findings according to the industries.

Dirk Voeste, Vice President Sustainability Strategy BASF

Matthias Kannegiesser, Board Member sustainable natives eG

Carsten Gerhardt, Partner A. T. Kearney GmbH

 **BASF**

We create chemistry

Automotive & Transportation

- Sustainability hot spot in automotive & transportation industry is the urban transport transition: growth towards 10 billion people in 2050 with 70% living in (mega-) cities will trigger a fundamental transformation to still ensure and enable sustainable transport of goods and people linked to cities.
- Most relevant trends according to experts are turning transportation emission-free, expanding public transport & cycling solutions and expanding urban multi-modal mobility & sharing solutions. These trends are rated high also in all regions including emerging regions such as Asia, Africa and Latin America.
- Electric vehicles are judged as most relevant trend linked to a specific technology, key regions for EVs are Asia, Europe and North America.
- Specific standards expected are for example multi-mobility cards for citizens and emission limits in cities, expansion of public, rail and electrified transportation as well as expansion of electric vehicle charging and battery storage infrastructure.
- Disruptive solutions like hyperloop or passenger drones are still judged as less relevant in mainstream transportation within the horizon towards 2030.

 **BASF**

We create chemistry

Agriculture & Food

- The agriculture & food sector is a key in the sustainable transformation. Solutions are needed to feed and supply 10 billion people with agriculture products while protecting ecosystems at the same time, such as protecting water, soil and biodiversity and limiting deforestation. The sector is also exposed to water and climate stress and has an important social impact lever on human rights and lifting out of poverty with hundreds of millions of small farmers specifically women working in the sector. Consequently, there are several trends of high relevance.
- Experts judge regional and local food production close to consumers as most important sustainability trend, where experts see a specific lever for the climate impact of the sector; the specific trend of urban farming fits into this with still less relevance for the mainstream market until 2030.
- Protecting ecosystems is equally important: organic farming, minimizing pesticide and fertilizer use, limiting water pollution and developing sustainable commodity standards (e.g. palm oil) are most relevant standards in this trend. Upcoming technologies such as digital & precision farming can help to limit the ecosystem impact. They are already rated important by most experts although being still in a starting phase.
- Experts also judge innovative technologies e.g. related to better seeds as highly relevant specifically in Middle East and Africa.
- Empowering small farmers & expanding fair trade specifically for Africa is perceived as important social impact trend, where tracking and tracing (certified) ingredients can positively contribute to ensure social together with ecological standards through the supply chain.

 **BASF**

We create chemistry

Agriculture & Food

- Finally, also food waste reduction and responsibly-raised livestock - meaning improving living conditions for animals are rated as important.
- Upcoming meat alternatives (lab meat, insect-based) are judged of lower importance when looking at the mainstream market towards 2030.

Note that meat vs. vegan/vegetarian nutrition question is analyzed in the pharma and health industry.

 **BASF**

We create chemistry

Consumer Goods & Retail

- Billions of people newly entering the middle class in the coming decades will bring new end-consumer growth for the consumer goods and retail industry globally. At the same time, pressure on sustainability challenges such as plastic waste & ocean and non-sustainable resource consumption increase.
- Experts therefore judge reuse and recycling as key trend for the industry (80%) as part of a transition towards a circular economy. Linked to this is the problem of plastic ocean cleanup (70%). Measures are reduce/limit packaging plastics, collecting and reuse systems as well as circular product design.
- Similar importance has the trend of e-commerce and consumer data protection (80%), digitalizing the consumer experience and retail supply chains provides opportunities as well as challenges; responsible consumer data usage and data protection in a digital age has become integral to sustainability action fields and measures.
- On the social side, hundreds of millions of people work in the consumer goods and retail industry with respective supply chains. Fair & social impact supply chain thus is key trend (80%) lifting people e.g. working in the textile supply chains out of poverty based on raised working conditions, ensured social standards or living wages on the positive side.

 **BASF**

We create chemistry

Consumer Goods & Retail

- On the negative side, ending human rights violations in these supply chains (75%) is a further key trend, be it preventing child labor, modern slavery and other forms of human right violations. The topic is particularly relevant for emerging regions in Asia, Middle East and Africa as well as Latin America. The role of transparency, standard certifications as well as direct collaboration and partnerships across the value chain to ensure human rights and social standards is expected to increase. Liability of corporations to become liable for human rights violations in supply chains is expected to increase.
- Finally substituting non-sustainable materials and ingredients and using with non-toxic, natural components is a further key trend (85%), sample categories are again textiles, cosmetics or toys. Specific examples are also bio-based and organic materials.

 **BASF**

We create chemistry

Energy & Utilities

- The energy and utilities sector (incl. water) are centrally exposed to decarbonize energy production to reach Paris Climate agreement as well as providing energy and water access to a growing global population with hundreds of millions still unserved.
- Nearly all experts judge the (global) energy transition built on renewable energy (95%) and energy efficiency (90%) as key trends towards 2030. Large-scale energy renewable projects as well as energy storage and grid expansion are the key standards with industry impact. Energy transition roadmaps are expected in various countries. For energy efficiency, energy efficiency in industry and public sector is expected as key contributor given low efficiencies still in many countries.
- Specifically, decentralized energy models (e.g. off-grid solar + battery solutions or hybrid off-grid solution) play a central role (75%). Prosumer energy models with individual people producing and storing own energy to be provided for community or the market play a key role.
- Digitalization is expected to empower the energy transition with smart data-driven energy management solutions (70%), such as smart grid technologies as well as big data energy management & analytics.

 **BASF**

We create chemistry

Energy & Utilities

- Water management solutions (70%) is a further trend with sustainable water management infrastructure (e.g. with carbon positive treatment plants) or decentral water pumping, cleaning and provisioning (when thinking of hundreds of millions not yet having access to sanitary facilities). Renewable energy-powered desalination is seen further high impact standard in this trend ensuring water access in drought periods.
- Interesting note that experts focus more on future energy solutions and respective growth in sustainable solution and technologies. Other regulation-related trends such as exiting non-sustainable energy (coal, etc.), applying a CO2 price is evaluated by most experts as important but less compared to solutions named before.

Engineering & Construction

- The engineering and construction industry are triggered by global population growth towards 10 billion as well as urbanization with 70% of world population will live in (mega-) cities by 2050. Thousands of new cities must be built specifically in emerging countries in Asia, Africa and Latin America, existing infrastructure and building must be renewed e.g. in US and Europe.
- Besides the sector contributes high shares of global energy consumption (building energy consumption), CO₂ (e.g. cement production) as well as resource consumption and waste (construction materials).
- Experts judge renewable energy and energy efficiency in the sector as a key trend (95%): specifically, renewables and energy efficiency for buildings related to cooling, heating and electricity supply for buildings are key topics. Notably experts rate renewables slightly more important than energy efficiency confronted with the fact that making existing buildings CO₂-friendly with energy efficiency is highly time-intensive and can last decades, while renewable energy may solve the CO₂ problem for buildings much faster.
- Green & climate-friendly materials is the second most important trend (90%): low carbon and climate-friendly materials (e.g. wood or low carbon cement) are important as well as health and safety-compliant materials (e.g. no toxic materials). Renewable materials such as recycled/recyclable as well as bio-based materials is a further important topic.

 **BASF**

We create chemistry

Engineering & Construction

- Given that specifically US and Europe have a massive infrastructure investment need (e.g. old bridges, roads, tunnels, etc.) and emerging countries plan to build new (green-field) cities, sustainable infrastructure projects rank third (80%); key standards are linked to prevent corruption in infrastructure projects, infrastructure enabling sustainable development e.g. in water, energy, public transportation infrastructure as well as climate-resilient infrastructure specifically in coastal areas given intensified storms and rising sea levels.
- The construction industry used to be a slow-changing industry: in the past 100 years, the way of building houses and infrastructure didn't change much. Experts expect this to change now due to digitalization and & building information modeling (75%): specifically building information modeling meaning having all data of a building during planning and building phase digitally available and dynamically updated for all building partners promises to reduced costs, lead times and improve quality substantially; 3D printing and industrialized construction in comparison is perceived as a visionary trend not taking still quite some time to enter the mainstream of the construction industry.
- Finally, affordable and shared housing (75%) is evaluated as a top trend: urban housing is increasingly unaffordable for people, while at the same time people moving into cities given better (digital) connectivity, infrastructure and services compared to rural areas. Topics like house sharing, price limits on rents as well as affordable housing building programs and affordable housing by design are as important standards to empower affordable housing and living in cities in an increasingly urbanized world.

 ■ BASF

We create chemistry

High Tech & Electronics

- The high tech & electronics industry is a key driver for the digital revolution transforming everyday life of people and businesses. At the same time, increasing energy consumption and electronic waste as well as scarce raw materials cause environmental challenges. Conflict materials and social standards in the supply chain are challenges on the social side.
- Experts emphasize the opportunities in the digitalization empowered by the industry: mobile-empowered social business model are ranked as key sustainability-trend in the industry (75%). Particularly mobile technology can help to enable a sustainable social and economic development in emerging countries. Key standards are expected for mobile banking, mobile health and mobile education to name a few use cases.
- Same importance is the trend of digital disruption in employment (75%): specifically, industrialized countries expect the 4th industrialized revolution with automation of many routine jobs including production, offices as well as knowledge-intensive disciplines (lawyers, tax, etc.). As a reaction to the disruption and a risk for a destabilizing social divide into rich (knowledgeable, owning robots and assets) and poor (less educated, not owning robots and assets), experts expect a change in social systems, such as a basic income, tax system changes (taxing resource consumption, robots, capital instead of labor); they also expect more shared value entities with a capital-return for the many.

 **BASF**

We create chemistry

High Tech & Electronics

- On the energy side, experts see the potential of electronics to save energy in their application reflected by the trend "smart electronics" (70%). Standards like smart grid standards using electronics to empower the energy system ready and efficient for the renewable age are ranking top of the list. In the context of Industry 4.0, electronics and data intelligence can help to save energy in machinery applications (e.g. on-demand usage of machinery); same holds true for household applications combined in smart home applications e.g. controlling heating and cooling via smartphone.
- On the other hand, rapidly increasing energy consumption of the industry, experts expect sustainable energy use for electronics (70%) as further key trend. Applications such as blockchain infrastructure, video streaming, search engines, cloud solutions, internet of things, etc. will substantially lead to an energy increase. Experts rank energy efficiency standards for electronics as well as off-grid powered electronics (with renewables) as potential solutions. Greening data centers is a further lever (e.g. with server virtualization, heat recovery, efficient/renewable cooling solutions).
- Human rights & fair supply chain are rated 5th (65%): social standards in high tech and electronics production specifically in conflict raw materials (e.g. Coltan in Africa). Besides, manufacturing locations in Asia are still exposed to forced labor, below living wage compensations, long hours, health and safety protection for workers; same holds true for electronic waste disposal when exported e.g. to Africa and dismantled there in poor areas with very little safety and health protection measures; increasing standards will be important trend for the industry; standards are human rights certification in sourcing minerals, anti-corruption in mining as well as social working standards in electronics manufacturing and health and safety standards in dismantling.

 **BASF**

We create chemistry

High Tech & Electronics

- Circular electronics is 6th on the list but specifically emphasized by interviews to no longer sell but lease out electronic products for use. Manufactures push towards keep owning the products to keep owning the raw materials which become increasingly scarce. Positive effects are that planned obsolescence can be mitigated and manufactures have incentive for modular and circular design with long-living materials.

 **· BASF**

We create chemistry

Pharma & Health

- Pharma & Health industry is directly linked to the UN Sustainable Development Goal (SDG) 3: "Ensure healthy lives and promote wellbeing for all at all ages". Still hundreds of millions of people either don't have access to basic health services and suffer under malnutrition or they are confronted with obesity and related health challenges.
- Experts judge access and affordability of health as key trend (85%): incl. access to affordable drugs/reasonable-priced pharmaceuticals, access to basic health services as well as affordable health insurance.
- Preventive health is same of relevance (85%) including promotion of healthy lifestyles (e.g. related to nutrition, sports, social well-being), preventive care for parents and children after birth and hygiene solutions.
- Digitalization in Health will be also of major importance (80%) with digitalization of health processes taking out administrative costs and time leaving more time for patient care. Telemedicine specifically in rural areas as well as digital support of patients are further standards of relevance.
- Health nutrition (75%) ranks on four, where programs to ensure basic nutrition for population, education and sensitization on healthy diets as well as supporting healthy diets and adiposities reduction are standards.
- The role of prevention and healthy lifestyles ranks before pharmaceutical or medical solutions. Digitalization can be a true enabler for the health system both in industrialized and emerging countries.

 **BASF**

We create chemistry