oekom Corporate Responsibility Review 2017

Global Transformation Processes – Are Companies Already On The Right Track?

oekom research

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Foreword

The world in crisis mode – Is sustainability still topical under these circumstances?

The current crisis mode of European and transatlantic politics, to which Brexit and the election of the new US president, Donald Trump, made important contributions, has quickly swept the challenges of global, sustainable development from the public agenda. It is as if sustainability has lost all relevance. That is a great mistake. Consumption, prosperity, growth and climate protection are, and remain, huge challenges.

The continuing growth of the world's population is leading to a real dilemma between continuing quantitative and qualitative demand-side pressure and the finite limits imposed by the available resources. We are not just talking about our European notions of consumption here, but those of China, India and many other countries which have embarked upon the path to attaining Western standards of living on a broad basis. No one can stop them from achieving that goal. And the environmental and social consequences of this growth will be enormous.

This places society and companies under pressure to adapt, and create innovative potential — thereby defining tomorrow's business world. For even if the *international* political agenda is dominated by security issues, *local* politics remains under immense pressure to act. The problem of fine dust from urban transport, the negative impacts of agricultural production on the soil and drinking water, and the condition of the world's oceans are just some examples. I therefore believe the future sustainability agenda will be defined less in the framework of international treaties, and far more by concrete, local and national legislation and technological innovations — in this oekom Review appropriately termed "transformation processes".

Encouraging for sustainable development is that, besides local and national troubleshooting legislation, many other players are also flying the sustainability flag. At Joschka Fischer & Company, during our consulting cooperation with small and mid-sized enterprises we observe and convey that non-governmental organisations are central and effective facilitators for taking action — and also some of the key partners for companies when it comes to identifying innovative fields and correcting deficits. Actors in the sustainable capital market also exercise significant leverage by steering investments to sustainable development and promoting transparency through sustainability reporting.

Sustainable development is unilaterally insurmountable; this is also indicated by the many initiatives of large enterprises to embed their primary and sub-suppliers. Besides improving the underlying data, such approaches also allow truly crucial and central challenges to be tackled. Besides global protection of the environment and climate, improved enforcement of human rights and working standards are particularly part of the agenda that large enterprises are meanwhile prescribing for their suppliers or, ideally, also addressing in concert.

These sustainability trends have arisen at exactly the right time in my opinion, as — with digitisation and robotisation facilitating and cutting the cost of consumption — demand for raw materials will rise accordingly. Recycling will become inevitable, and potentially become a technology export blockbuster as raw-material prices increase. Sustainability is therefore more than topical: it is the order of the hour, and of the future.

I wish you a satisfying read!

Joschka Fischer
Former Foreign Minister and Deputy Chancellor of the Federal Republic of Germany

Editorial

"Be the change you wish to see in the world." These words by Mahatma Gandhi most befittingly describe the task currently facing us. The United Nations' Sustainable Development Goals (UN SDGs) and Paris Climate Agreement not only commit the community of nations, but also companies and investors, to contributing actively towards achieving a sustainable society and curbing climate change. In other words, if something is to change, it is up to all of us to act now.

To persuade companies and investors to play their role, two important political impulses were recently sent out at a European level: the Directives endorsed by the EU Parliament in November 2016 for including ESG (→ environmental social governance) criteria in pension funds and the start of CSR reporting obligations for companies from the start of this year. These developments not only help improve corporate and investor orientation; they also dampen any arguments for shirking sustainable action.

Nonetheless, a number of new aggravations and uncertainties have also arisen which could potentially impede achievement of the ambitious sustainability goals. The climate- and economic-policy course change of the new US government, for instance, gives certain rise for concern: what are the consequences of the world's most powerful nation being led by a man who denies man-made climate change? Or of other European countries following the UK and leaving the European Union, possibly seriously undermining a driving force of sustainable development? While the future is impossible to predict, one thing is certain: nature sets the agenda. Overconsumption of natural resources can, at most, be only a short-term solution, but one which can never succeed in the long term. Our unsustainable lifestyle has meanwhile progressed to such an extent that the ensuing negative external effects — such as climate change or diminishing supplies of raw materials — have become very tangible. And with many of these external effects now manifesting themselves financially, the sustainability train, with all its associated transformations, has become unstoppable.

As an agency for sustainability issues, our mandate lies in measuring how companies and nations fulfil their responsibility towards the environment and society. In other words: the contribution they make towards sustainable development. In our annual CR Review, we take stock of the situation — but already now, I can let slip: things are starting to happen. While the share of companies with oekom Prime status rose only marginally last year, the share of businesses in industrialised nations with mid-field sustainability management rose sharply — from 35 per cent in 2015 to over 40 per cent today. Conversely, the share of companies with inadequate sustainability performance has continued to fall — from over 48 per cent in 2015 to 43 per cent today. Despite the considerable residual potential for improvement, we should interpret this as a positive signal of companies' increasing interest in pursuing the opportunities of sustainable development.

This momentum and, notably, many institutional investors' increasing appreciation of sustainability indicators as potential drivers of investment yields, have powered our company's astronomical growth over the past year: our team, which was 75-strong at the start of last year, has now grown to 105; new offices were opened in London and New York; our Paris subsidiary was expanded; and over 160 asset managers and asset owners in 13 countries incorporate our research into their investment decisions. Our analyses thus influence around EUR 1.5 trillion of assets under management — a figure we are very proud of.

Last but not least, I would like to express my sincerest thanks to Joschka Fischer for his Foreword. I wish you an interesting and invigorating read!

Robert Haßler
CEO oekom research AG

Summary of the key results

Development of ESG performance in the oekom Universe

- The share of companies in the GLCU which was awarded **oekom Prime status** (classification as "good" or "excellent") rose marginally over the past year, from 16.29 to just over 16.5 per cent. By contrast, the share of companies in the mid-field, with fundamental sustainability management, rose more noticeably, from 35.86 per cent in 2015 to 40.15 per cent today. As in past years, the majority of companies—at 43.31 per cent—continues to exhibit inadequate commitment in the area of sustainability. This distribution is also found at companies in emerging markets: here too, a slight, but continual, positive trend towards better sustainability performance is evident, albeit at a lower absolute overall level.

- On average, none of the sectors is even close to fulfiling the standards which, from the perspective of oekom research's **Best Practices** and **Best Possible Practices**, would be necessary to bring their activities in line with global sustainability goals such as the UN Sustainable Development Goals. In this area, notable climbers over the past year have been the Electronic Components and Semiconductors industries, each of which has risen circa 5 percentage points.

- Large commercial banks have also made above-average gains, where an increasing awareness for sustainability aspects in asset management is emerging in the areas of investment funds and also, at a higher level, in the context of integration and asset overlay strategies. Increasing numbers of banks are also beginning to recognise minimum sustainability standards for project financing—including in countries and regions in which this was not previously commonplace, such as in Asia. In addition to this, the widespread publication of fundamental ESG information has recently risen perceptibly in this traditionally somewhat opaque industry.

- Like last year, the **Automobile** and **Household & Personal Products** industries topped the rated industries ranking. Against this background, the even more improved rating of the automobile industry can be exclusively ascribed to the elimination of last year's worst-faring company, Daihatsu Motor Co Ltd, from the Universe. Like Automobiles, the Household & Personal Products sector is also relatively small and exercises good standards in several central areas without larger negative deviations. Against the generally positive trend, however, the average value has fallen slightly compared to last year—with almost all the industry's top performers forfeiting large numbers of points.

- This year, too, the **most controversial industries** with severe and very severe breaches of the principles of the UN Global Compact come from the raw materials segment. Frontrunner is the Oil & Gas Equipment/Services sector, in which six out of every ten companies are affected by controversies. It is followed by Oil, Gas and Consumable Fuels at 47.9 per cent, and Metals & Mining at 39 per cent. Were moderate controversies also to be included for the latter two, the share would rise to 70.4 per cent and 61.0 per cent respectively.

- At 30 per cent, companies in the Oil & Gas Equipment/Services sector are also frontrunners for involvement in **corruption controversies**. Like last year, it is followed in second place by the Construction industry at 15.4 per cent of all companies.

- The Textiles sector again leads the rankings for **labour rights controversies**, even though the value has fallen from 25 per cent to about 20 per cent. By contrast, the share of affected companies in the Electronic Devices & Appliances industry rose noticeably: within the space of a single year, the number of affected companies almost doubled to 13.7 per cent.

- Even if "only" around every tenth company in the most controversial industries is encumbered by a severe controversy in the area of **human rights controversies**—the list is headed by the Oil, Gas & Consumable Fuels industry at 9.9 per cent—a glance at the moderate controversies highlights that human-rights violations are unequivocally a structural problem in certain industries: with this extended view, for example, the number for the Metals & Mining industry rises from a 7 per cent to almost 25 per cent.

- The industries also exhibit structural problems when looked at from the perspective of **environmental controversies**. Over 40 per cent of the companies in the Oil, Gas & Consumable Fuels sector are embroiled in such controversies, and as well as a solid 34 per cent in the Metals & Mining sector. If moderate controversies are also included, the shares rise to 67 per cent and almost 50 per cent respectively.

Transformation processes: opportunities and risks for companies

- Initiatives such as the UN SDGs and the Paris Climate Agreement intensify transformation processes, which will increasingly also change the economy. Companies will be confronted with challenges and the effects of these initiatives will also become an ever-more important element of investors' risk analyses. Another aspect which is becoming increasingly relevant for investors is also whether, and how, a company's products and services contribute directly to sustainable development. Ratings and research information that focus solely on management and good corporate governance fall short here and need to be supplemented by accurate and detailed **analyses of product portfolios**.

- For companies and investors, a solely retrospective view of the direct carbon footprint is insufficient for **assessing climate performance**. Rather, what is needed are risk analyses encompassing the entire value creation chain, as well as forward-looking goals and strategies which address the transformation to a low carbon global economy. The first winners and losers are already beginning to emerge in the current transformation process. Particularly the Utilities sector can make a significant contribution to climate protection by switching to renewable energy sources, operating highly-efficient plants, and avoiding carbon, natural gas and methane emissions.

- The **Green Economy** as the guiding principle for designing economic processes which take environmental and social aspects into account can—paradoxically—also generate serious conflicts of interests. As sustainability goals cannot always be pursued without negative collateral effects for other parties, such goals may be counterproductive to comprehensive sustainable development. Consequently, the oekom Corporate Rating takes a differentiated stance when evaluating even apparently positive technologies and projects. Conflicts of interests arise, for example, in water and wind farm projects for generating renewable energies, in the cultivation of palm oil for the production of biofuels, and in using solar modules and insulation.

- The **Automobile** industry is a prime example of transformational change: here, the first transformations are emerging in a sector in which underlying conditions have transformed dramatically within a very short period of time, rendering former product strategies obsolete. The industry must already start tackling key questions about its future to address increasingly stringent legislation and the long development cycles needed for its products and technologies. Despite this, the industry's key players nevertheless continue to trust almost entirely in the internal combustion engine—despite the environmental and health problems this technology causes. The further development of alternative scenarios to the internal combustion engine and radically new mobility concepts are central challenges upon which the car's role and function as a means of mobility and transport, and the very future of the industry, depend.

- For some time now, **oil and gas companies** have also increasingly been the focus of divestment measures. Their current business models are coming under increasing pressure, as these essentially

continue to centre on a largely unabated demand for oil and gas, and contain barely any recognisable efforts by operators to reduce their own operational greenhouse gas (GHG) emissions or gradually establish renewable energy divisions. Oil and gas reserves run the risk of becoming stranded assets on a large scale. Estimates say the coal, oil and gas industry may have to incur sales losses of up to USD 33 trillion over the next 25 years. With just four of the 146 rated companies qualifying for Prime status, Oil, Gas & Consumable Fuels is one of the worst sectors in the oekom Universe in this regard.

- The **Food & Beverages** industry is, particularly through its supply chains, one of the central contributors to global megatrends such as climate change, resource scarcity and loss of biodiversity. It thus plays a key role in transforming global economic cycles to the benefit of a more sustainable world. Despite this, the growing pressure to change is only being met by an insufficient or inadequately comprehensive response. In addition to manufacturing products, which are often problematic from a nutritional perspective, the industry also continues to ignore massive negative environmental and social repercussions in its supply chains.

1. Sustainability in the economy: an overview

1.1. A new global framework

That our planet's resources and resilience are limited is nothing new. What is new, however, is that it is now possible to quantify both the limits and the extent of the burden with far greater accuracy than in the past. In its "Planetary Boundaries"[1] concept, for example, the Stockholm Resilience Centre concluded that four of the nine planetary boundaries used to define global priorities associated with man-made environmental changes had already been breached. Accordingly, mankind is already living beyond its means in the areas of climate change, loss of biodiversity, biogeochemical cycles and land usage. Other thresholds have also already been breached on a regional basis.

A similar message has also been sent by the so-called Earth Overshoot Day of the NGO Global Footprint Network[2]. Earth Overshoot Day is the name given each year to the calendar date on which, based on the model's calculations, the global consumption of resources exceeds the Earth's annual capacities. While this date was still in December 30 years ago, it was reached on 8 August in 2016.

Even if such calculations are methodologically imprecise, the fundamental facts tell an unambiguous tale. The ensuing pressure to take action may have contributed decisively to the recent endorsement of extensive international sustainability treaties and programmes. While similar agreements were also reached in the past, and in many cases it still remains to be seen whether their implementation will live up to the substantive aspirations, this time around there is a crucial difference. The unprecedented momentum which has developed in some areas gives hope that, in the future, the international community will seek solutions to the Earth's problems with more vigour than it has done over the past decades.

Notable here are, in particular, the Paris Climate Agreement and the United Nations' Sustainable Development Goals:

As the successor treaty to the Kyoto Protocol, the Paris Climate Agreement, which was endorsed in December 2015, officially took effect at the start of November 2016 following its ratification by the world's largest producers of greenhouse gas emissions, as well as numerous other countries. The Agreement formally aims at limiting the increase in global warming to a maximum of 2° Celsius, and even foresees a maximum increase of 1.5° Celsius.

The United Nations' Sustainable Development Goals (UN SDGs) were also ratified in 2015—as a new target consensus for sustainable development over the 15 years leading up to 2030. Under the five key areas of People, Planet, Prosperity, Peace and Partnership, 17 global goals were agreed upon which equally address all nations, and also commit non-sovereign players in the business, civilian and scientific communities.

But other, less prominent regulations also set a new framework for companies, thereby changing their agendas. Examples of these include the UK's 2015 Modern Slavery Act, which demands transparency on the ways in which companies combat forced labour, slavery and people trafficking in their supply chains. Another example is the US's 2016 import ban on products which were made with the help of forced labour (2016 Amendment to the Smoot-Hawley Tariff Act of 1930 to ban import of goods produced with forced labour).

It appears that the current initiatives are setting in motion processes which will not only challenge the political arena, but also change the economy, at a faster pace and to a greater extent than before. Companies will be able to benefit from these processes if they successfully act in accordance with the challenges and offer solutions to the Earth's problems. Conversely, however, they could ultimately endanger their existence if they fail to adapt their business models to the changes and, in doing so, continue offering products and services which disregard the market's needs, thereby forfeiting their social "license to operate". The automotive industry is a prime example as a sector which, for many decades, refused to seriously accept the abandoning of the internal combustion engine as a credible scenario and in which, for many years, research conducted by many carmakers into alternative engine systems was lacklustre at best. The industry was shaken, however, when, in 2016, the governments of several countries openly contemplated a ban on the licensing of vehicles with

internal combustion engines starting in 2025 or 2030 respectively. Other restrictions must also be expected in the fight against climate change and inner-city fine dust pollution. Without a rapid change in mindset, it will become increasingly difficult for the industry's established players to maintain their current dominant positions.

For this reason, more and more investors are taking a keen interest in companies' performances in these areas. This is because certain sustainability issues are no longer treated as only ethical issues but also as risk issues alongside classic financial KPIs. This is manifesting itself not least in the massive divestment wave which, for over a year now, has been impacting companies with substantial coal activities.

It is therefore befitting that the European Union has directed companies to improve transparency on the sustainability of their activities. In October 2014, a "Disclosure of Non-Financial Information" directive was endorsed which had to be implemented in national law by the end of 2016: for the first time, in FY2017, all capital market-orientated companies in the EU with over 500 employees are required to disclose information on the environmental and social impact of their business activities.

But greater transparency is also being demanded by investors, themselves: in France, for example, where, since the start of 2016, the Energy Transition For Green Growth Act has required institutional investors, inter alia, to provide for transparency on the carbon footprint of their investments and the associated climate risks. The importance of ESG was also strengthened at a European level at the end of 2016: under the revised directive on pension funds (IORP II), fund managers must take environmental and social risks into account in their funds and provide information about the ESG aspects of their investment policies.

To be able to assess companies' corporate responsibility and risk exposure with respect to the current sustainability challenges, and selectively use the findings in ESG investment strategies, specialised ESG research is needed which accounts for the increasing complexity of the industry- and topic-specific interdependencies. Against this background, the research results of 2016 on how global companies fundamentally deal with sustainability challenges is summarised in the following section. The entire third main section of this year's CR review is dedicated to the issue of the extent to which companies are ready to master the outlined transformation processes.

Sources:

1 http://www.stockholmresilience.org/research/research-news/2015-01-15-planetary-boundaries---an-update.html

2 http://www.footprintnetwork.org/our-work/earth-overshoot-day/

Basis of the analysis: the oekom Universe

The number of companies analysed and rated in the oekom Universe has grown continually over the past years and had risen to 3,800 by December 2016. Last year, all affiliated corporate issuers were also identified to establish the extent to which the ratings of the companies analysed by oekom research can also be substantively applied to subsidiaries which issue bonds and/or shares. This enabled a further 1,800 companies to be added, now positioning oekom research to provide intelligence on a total of 5,600 issuers.

In doing so, the oekom Universe covers, inter alia, all those companies listed in major international and numerous national stock indices and is broken down into three groups:

1. large, publicly listed enterprises in conventional industries;
2. often small and mid-sized, publicly listed enterprises in industries which have a clear connection with sustainability topics, e.g. in the fields of renewable energies and energy efficiency, recycling technologies, water treatment and education; and
3. bond issuers which are not publicly listed, e.g. regional banks, supranational organisations such as the World Bank, or railway operators.

All of the companies are analysed using a uniform procedure and on the basis of comprehensive and regularly updated criterion catalogues. The goal of the oekom Corporate Rating is to provide a comprehensive assessment of the companies' sustainability performance and future viability and, within the individual sectors, to identify those companies with the best and most successful strategies in this respect. In doing so, the employed criteria relate to all areas of corporate responsibility. They each encompass around 100 individual criteria, a large proportion of which is industry-specific. They include, inter alia, the way in which companies treat their workforces and suppliers, corporate governance aspects, and the environmentally-friendly design of products and production processes. All of the criteria are individually weighted, assessed and finally aggregated to an overall value (rating), whereby the four to five industry-specific key issues account, in total, for a minimum of 50 per cent of the overall weighting. The criteria are further developed at regular intervals to take account of new scientific, technical, social and also legal developments. Last year, for example, all industries were upgraded with the elements of the portfolio rating used to quantify the positive or negative contributions the companies' products and services make towards achieving the UN's Sustainable Development Goals, along with the companies' strategies to better align their product portfolios with these goals in the future to improve long-term viability.

To produce a comprehensive and balanced picture of the companies to be rated, our analysts include relevant information from the companies themselves, as well as from independent sources, in their ratings. In the rating process, the analysts also maintain an active dialogue with the companies, giving them an opportunity to comment on, and supplement, the results. An external Rating Committee assists oekom research's analysts with the substantive form of the industry-specific criteria to be used for the rating, and conducts plausibility checks on the rating results.

oekom research also analyses each company for the existence of controversies in a total of over 20 thematic areas. In doing so, distinctions are made between controversial business fields, such as nuclear power, fossil fuels and armaments, and controversial business practices, such as labour and human rights controversies. For the latter, a new system was launched last year to provide a differentiated representation of the severity of the circumstances; in this way, investors who e.g. apply exclusion criteria can now adjust these more precisely according to their specific needs.

oekom research's intelligence serves as the basis for a very wide range of sustainable investment strategies ranging from best-in-class approaches and the use of exclusion criteria to integration and engagement.

The following assessments of ESG performance and controversies in the areas which are the subject of the principles of the UN Global Compact do not relate to the entire company Universe covered by oekom research, but only to the sub-universe of internationally active large companies domiciled in an industrialised country. There are around 1,600 such companies which are referred to below as the **Global Large Cap Universe (GLCU)**.

1.2. ESG performance of global companies

To reflect regular changes in the underlying environmental, social and governance conditions for companies, the indicators used in the ESG rating also undergo continual updates. Generally, these changes involve a tightening of the rating standards—e.g. because the regulatory environment has been intensified through stricter threshold values, or because improved technical possibilities for reducing emissions become available, thereby raising the best-practices yardstick. Besides this, entirely new areas of action also often come into focus; these are then broached by the rating at an early stage to give research users a type of early-warning system for the companies' future risks and opportunities.

The overall results described in this report must therefore be interpreted against the background of a rating which is continually in flux. While the distribution of companies over the four categories (see Fig. 1) has essentially remained constant over the past years, the standards of the companies' sustainability management activities have gradually improved. However, as the demands placed on companies also rose concomitantly, the net effect on the overall picture has been relatively small.

As a rule of thumb, therefore: companies whose ESG efforts remain relatively static over the years will gradually fall in the rating; companies with moderate improvements retain their positions; and companies which have made substantial progress will rise in the rating.

Against this background, developments over the past years, and especially in 2016, can certainly be regarded positively: the overall rating of sustainability management and sustainability performance of not only large, internationally-active companies in the industrialised nations (GLCU), but also of large companies in emerging markets (EM, see Fig. 2), shows a slow but constant upward trend which even accelerated slightly in 2016. In parallel, the average rating of all observed companies has also risen continually. Possible reasons for this are manifold: on the one hand, more and more countries are introducing a reporting obligation for ESG information, resulting in a continual—and not just vertical, but also horizontal—increase in transparency on the rating's relevant topics. Nevertheless, as increased transparency does not automatically translate to an immediate improvement in performance, the information boost has notably resulted in a shift in scores for those companies at the lower end of the overall rating.

At the same time, a greater awareness for sustainability topics has become generally observable. In some cases, this may be due to stricter regulatory guidelines; but the underlying economic relevance of sustainability is also starting to play a role in many companies' business decisions. One reason for this is that sustainability issues are becoming increasingly relevant for investors—and therefore rebounding on the companies. Meanwhile, more and more companies are directly contacting sustainability-inclined investor groups, referring, for example, to their results in relevant sustainability ratings and indices. This effect has also become tangible in oekom research's day-to-day research work where, after completion of each rating process, the analysed companies are given the opportunity to comment on the process as well as on the substantive quality of the rating. In doing so, more and more companies say they regard the rating results as an important stimulus for further developing their sustainability management systems.

Last year, the share of GLCU companies awarded oekom Prime status (classified as "good" or "excellent") rose only marginally from 16.29 per cent to just over 16.5 per cent. By contrast, the mid-field grew noticeably, the share of companies with fundamental sustainability management rising from 35.86 per cent in 2015 to 40.15 per cent today. In this group, the number of companies which narrowly missed Prime status also rose slightly, meaning the Prime group has the potential to grow moderately in the future.

As in the past, however, the largest share of companies—at 43.31 per cent—continues to make inadequate sustainability commitments. This value has nevertheless fallen almost ten percentage points over the past four years.

A similar positive trend is also observed for companies domiciled in emerging market countries. Here too, a slight, but continual, positive trend towards better sustainability performance is evident, albeit at a lower overall level than for the GLCU companies.

A comparison of the average rating of all companies in the overall Universe (both GLCU and EM companies) over the mid-term also reveals a constant upward trend: while the 2012 averages were only 26.3 (GLCU) and 13.31 (EM), the 30 and 20 marks respectively were breached for the first time at the end of 2016.

It is difficult to predict how these values will develop in the future, as opposing trends are expected: while further increases in corporate transparency and rising pressure from investors and legislators will lead to positive developments, the practical inability to align certain business models with the heralded transformation processes over the long term will probably cause shifts in the ratings within and between the sectors.

Thoroughly tracking these change processes will also be in investors' interests as the processes will influence a company's future success more so than in the past. This is also particularly true for those companies which have hitherto failed to perceptibly implement adequate systems to manage sustainability requirements, in turn exposing them to greater risk of being unable to adapt their business models (sufficiently quickly) to a changing environment. Sections 3.1 to 3.6 take a closer look at this.

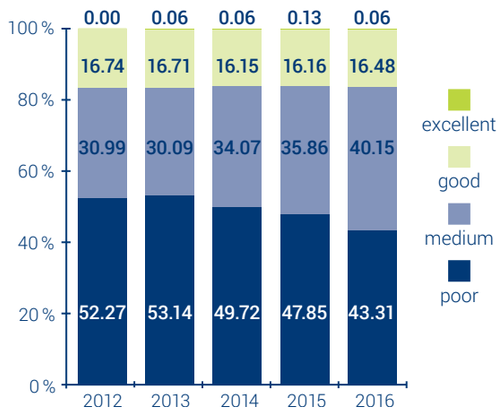

Fig. 1: Rating of the sustainability performance of large, internationally active companies domiciled in industrialised countries (GLCU); in %; in each case, as at 31 December of the respective year; source: oekom research (2017)

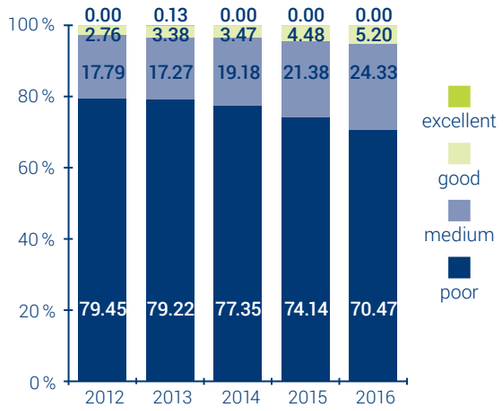

Fig. 2: Rating of the sustainability performance of large, internationally active companies domiciled in emerging market countries (EM); in %; in each case, as at 31 December of the respective year; source: oekom research (2017)

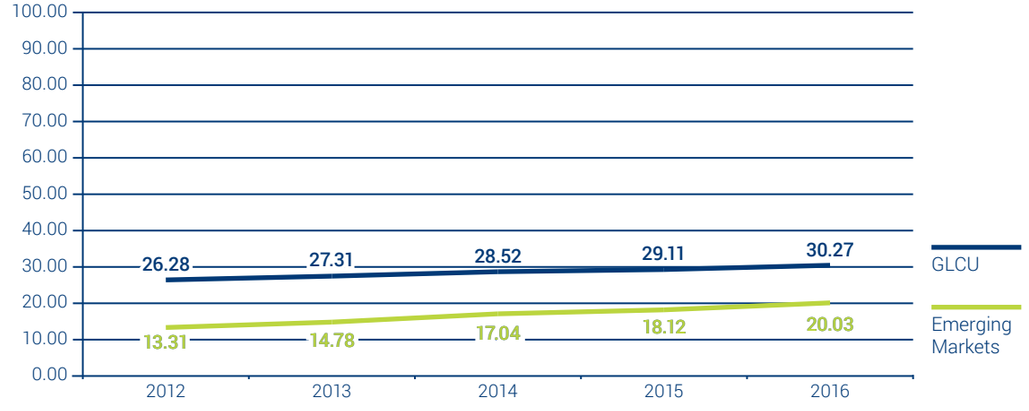

Fig. 3: Average rating of all GLCU and EM companies on a scale of 0 to 100 (best score); in each case: as at 31 December of the respective year; source: oekom research (2017)

1.3. An industry comparison

In its company ratings, oekom research pursues an expressly industry-specific approach. Of the total of around 700 individual indicators, around 90 per cent are industry-specific aspects; because of this balance, the individual industries' key issues account for at least 50 per cent of the total weighting in the final rating. To allow comparison of the individual industry ratings, the alphabetic ratings of the oekom scale from D– to A+ (best rating) have been converted into numeric ratings ranging from 0 to 100 (best rating). The converted value can then be interpreted to mean: companies in an industry with a higher rating are better positioned to deal with their industry-specific sustainability challenges than companies of another industry with a lower rating.

At the same time, however, it should be noted that, inter alia, the size and geographic composition of the industries vary, which can influence the final results. In very large industries, for example, the rating bandwidth is often much larger than in smaller ones. In addition, the ESG management systems of European companies tend to be on average more mature than those of companies in other regions around the world. Industries with a more European background may thus have a higher average rating.

Looking at the respective sustainability performances, it becomes evident that, on average, none of the sectors even closely fulfils the standards which, from the perspective of oekom research's Best Practices and Best Possible Practices, would be necessary to bring their activities in line with global sustainability goals such as the UN Sustainable Development Goals. What also becomes clear are the enormous differentials between the industries: while some industries come at least relatively close to the 50 per cent threshold, others average less than a quarter of the maximum value.

Significant climbers since last year have been the Electronic Components and Semiconductors industries, each of which has risen around five percentage points. One of the reasons for this is that, for the first time in 2014, the so-called Dodd-Frank Act started requiring US companies to disclose information on whether they use conflict materials from specific countries for manufacturing their wares. Conflict materials are raw materials such as tantalum, tin and gold that originate from crisis and conflict zones, particularly the Democratic Republic of Congo. Warring factions often finance their armed struggle through the sale of these raw materials. Corresponding transparency guidelines also exist in other countries around the globe. Because of this disclosure obligation and for fear of imminent damage to their reputations, many companies have joined the Conflict Free Sourcing Initiative[3] or started using its data and instruments to avoid sourcing these raw materials from particularly critical regions. Also observable in these industries is that suppliers in emerging economies are increasingly yielding to sustainability standards under customer pressure. Other aspects contributing to the improved results are: the ratings' growing weighting bias towards highly sustainable product portfolios and companies' increasing offering of product solutions, particularly in the area of energy efficiency.

Analogously to the overall results presented in Section 1.2, many industries showed slight improvements. By contrast, the large commercial banks made sizeable, above-average gains. Besides structural reasons (the Asset Managers & Securities industry's companies achieve poorer results on average than the commercial banks, and are now being rated separately), there are also substantive reasons: an increasing awareness for sustainability aspects in asset management is emerging in the areas of investment funds and, also at a higher level, in the context of integration and asset overlay strategies. Increasing numbers of banks are also beginning to recognise minimum sustainability standards for project financing—including in countries and regions in which this was not previously commonplace, such as in Asia. In addition to this, the widespread publication of fundamental ESG information has recently risen perceptibly in this traditionally somewhat opaque industry.

Like last year, the Automobile and Household & Personal Products industries topped the rated industries ranking. However, this year they switched places. Against this backdrop, the improved rating of the Automobile industry can be exclusively ascribed to the elimination of last year's worst-faring company, Daihatsu Motor Co Ltd, from the Universe. While the top companies' ratings deteriorated slightly over the past year, companies in the mid-field improved slightly. The industry's relatively good average rating can be attributed particularly to its traditionally high standards in areas such as labour rights and environmental standards in production. It is also a relatively small industry without any large negative rogue deviations. Section 3.4 nevertheless takes a closer look at the question of the industry's future viability, given the expected tightening of fuel-consumption and emissions guidelines, and a shift towards electromobility. As the rating assigns an ever-greater weighting to the sustainability quality of this industry's products, a gradual fall in the average score is foreseeable for this sector as long as it fails to take perceptible, systematic countermeasures.

Like Automobiles, the Household & Personal Products sector is also relatively small and implements good standards in certain central areas without larger negative deviations. Against the general trend, however, the average rating value has fallen slightly compared to last year—with almost all the industry's top performers forfeiting large numbers of points. The main reasons for this are that some of the substantive requirements were tightened in several key areas last year, and that many of the rated companies have been unable to demonstrate convincing measures in these topical areas thus far. Of particular relevance here are the topics of responsible sourcing of raw materials (e.g. palm oil) and problematic constituents (carcinogens and allergenic substances, as well as microplastic and nanoparticles).

Two classes of industries can be found at the bottom end of the ranking. First, there are those, such as Oil, Gas & Consumable Fuels, which have highly problematic business models from a sustainability perspective—the question of this industry's ability to achieve a transition to less carbon-intensive fuels is investigated in Section 3.5. Second, there are those industries which have made no perceptible commitment to sustainability management to date, such as the Real Estate sector. In the case of the latter, gradual increases in transparency and a gradual rise in the importance of sustainability topics are expected – not just in individual industries, but across all such sectors.

The past years' gently rising rating trend described in Section 1.2 on the overall rating is also reflected in the multi-year trend at an industry level, where a slow but continual improvement in the average rating is observable in many industries.

When presented as a profit and loss calculation over a six-year period, the varying rates of change towards

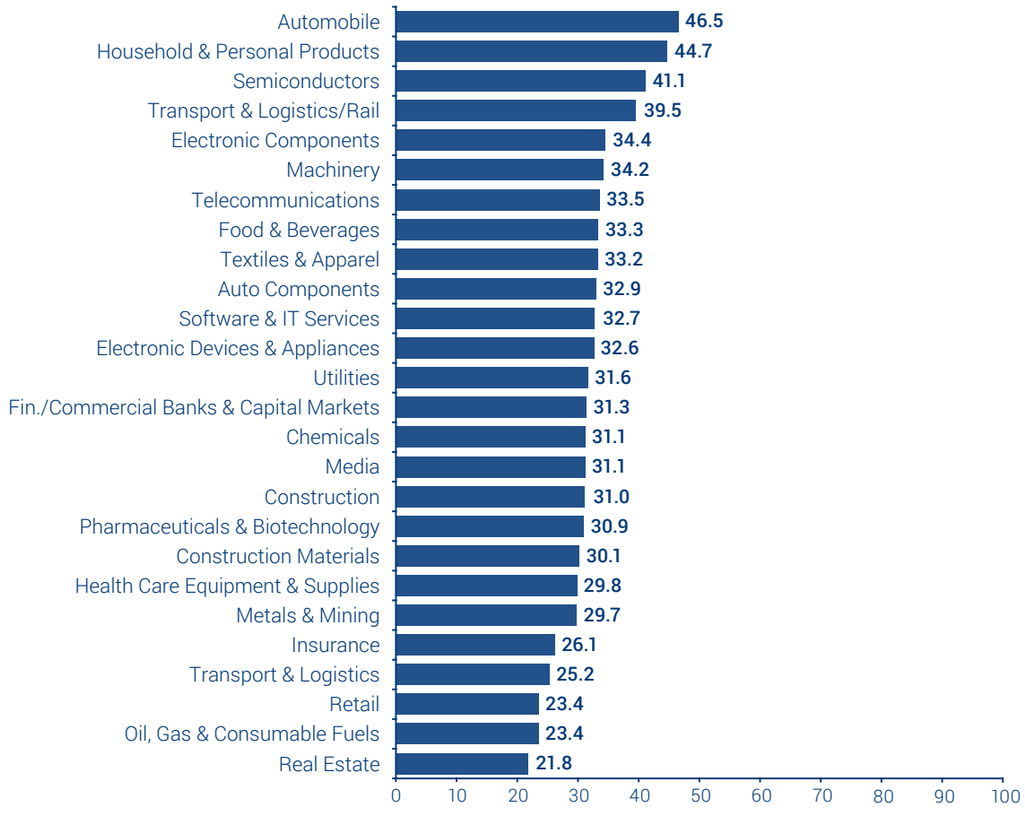

Fig. 4: Average rating of the companies in selected industries on a scale from 0 to 100 (best rating); basis: GLCU; as at 31 December 2016; source: oekom research (2017)

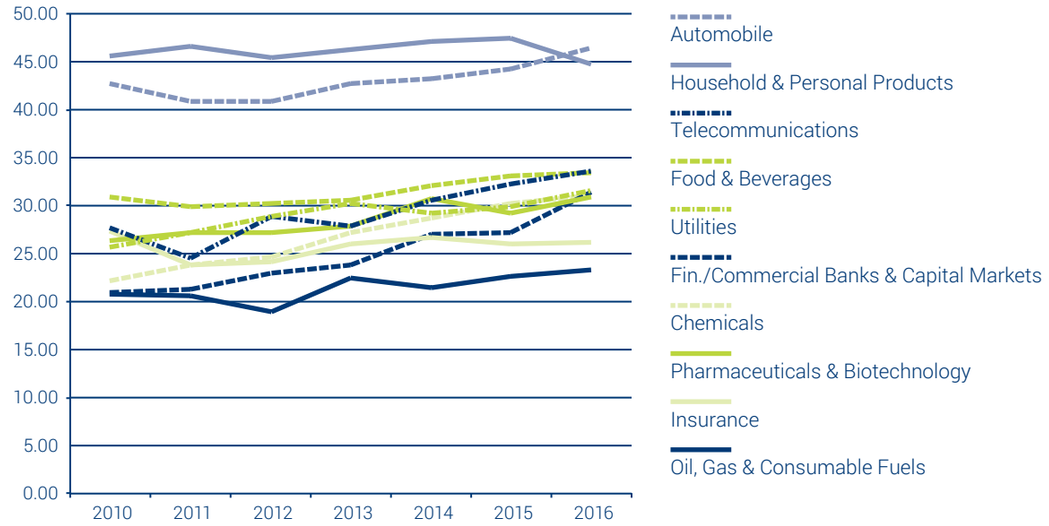

Fig. 5: Change in the average rating of the companies in selected industries over the past years on a scale of 0 to 100 (best rating); basis: GLCU; as at 31 December 2016; source: oekom research (2017)

a better sustainability performance also become evident. Most industries improved over this period. Some, such as Chemicals and Financials/Commercial Banks even made significant gains. In contrast to this, there are also industries who's average ratings fell. The Insurance industry, for example, made little headway with respect to sustainability over the past years, despite steadily growing demands on the sector over the same period. Here, the relatively small number of active companies thus remains confronted by a broad majority of companies which have so far perceptibly taken only the first steps, at most, to implement sustainability management systems. In addition, the conspicuously small number of ESG initiatives in the industry, such as the UN Principles for Sustainable Insurance, have also only succeeded in stimulating mediocre momentum to date.

Sources:

3 http://www.conflictfreesourcing.org/

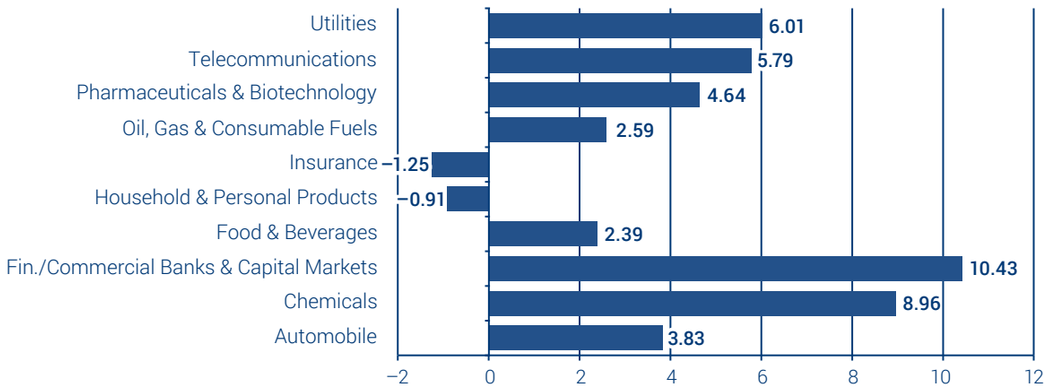

Fig. 6: Absolute change in the average rating of the companies in selected industries over the period 2010 to 2016 inclusive; basis: GLCU; as at 31 December 2016; source: oekom research (2017)

1.4. Top industry performers

The list of Top 3 companies in the respective industries contains many companies which for many years have been actively and successfully implementing systematic management procedures in key sustainability fields and have consequently scored well in the oekom Corporate Rating. In view of the accelerating rate of change in the underlying ESG conditions, they are faced with a decisive challenge: can they exploit their current strategic advantage to adapt more effectively than their competitors to new challenges, or will they be toppled from the top-performer positions by companies with entirely new business models and more sustainable product solutions?

This transformation already started taking hold in industries such as Oil, Gas & Consumable Fuels some years back: while traditional, integrated oil companies used to be listed at the top of the ranking rather frequently, pure gas concerns have been taking the lead for some time now, with gas being a less-problematic fuel than oil from a climate perspective. As far as integrated oil companies are concerned, Total is currently the only one remaining in the top group—notably due to its ambitious goals to switch to natural gas and renewable fuels. This trend is also set to gain momentum in other industries, such as Automobiles and Transport.

Table 1: The best three companies in selected industries; Basis: GLCU; as at: 31 December 2016; companies in parentheses have failed to achieve oekom Prime Status; source: oekom research (2017)

Industry	1st place			2nd place			3rd place		
Auto Components	Cie Generale des Etablisse-ments Michelin	FR	C+	Valeo SA	FR	C+	Denso Corp	JP	C+
Automobile	Peugeot SA	FR	B	Renault SA	FR	B–	Bayerische Motoren Werke AG	DE	B–
Chemicals	Akzo Nobel NV	NL	B	Evonik Industries AG	DE	B–	Novozymes A/S	DK	B–
Construction	Berkeley Group Holdings PLC	GB	B–	Vinci SA	FR	C+	(Barratt Devel-opments PLC)	GB	C
Construction Materials	Geberit AG	CH	B	Cie de Saint-Gobain	FR	C+	CRH PLC	IE	C+
Electronic Components	Schneider Electric SE	FR	B	OSRAM Licht AG	DE	B–	Legrand SA	FR	B–
Electronic Devices & Appliances	Ericsson	SE	B–	Koninklijke Philips NV	NL	C+	Toshiba Corp	JP	C+
Financials/Commercial Banks & Capital Markets	Raiffeisen Bank International Group	AT	C+	BNP Paribas SA	FR	C	ABN AMRO Group NV	NL	C
Food & Beverages	Coca-Cola European Partners PLC	GB	B–	Nestle SA	CH	C+	Unilever NV	NL	C+
Health Care Equipment & Supplies	Baxter Interna-tional Inc	US	B–	Coloplast A/S	DK	C+	Sonova Holding AG	CH	C+
Household & Personal Products	Henkel AG & Co KGaA	DE	B	Svenska Cellu-losa AB SCA	SE	B–	Kao Corp	JP	B–
Insurance	CNP Assurances	FR	C+	Munich Re	DE	C+	Hannover Rueck SE	DE	C+

Industry	1st place			2nd place			3rd place		
Machinery	Atlas Copco AB	SE	B	SKF AB	SE	B–	MAN SE	DE	B–
Media	RELX PLC	GB	B–	WPP PLC	JE	C+	Sky PLC	GB	C+
Metals & Mining	Norsk Hydro ASA	NO	B	Boliden AB	SE	B–	Arconic Inc	US	B–
Oil, Gas & Consumable Fuels	Enagas SA	ES	B	Snam SpA	IT	B–	TOTAL SA	FR	B–
Pharmaceuticals & Biotechnology	Sanofi	FR	B–	GlaxoSmith-Kline PLC	GB	B–	Merck KGaA	DE	B–
Real Estate	British Land Co PLC/The	GB	B–	Gecina SA	FR	C+	Unibail-Rodamco SE	FR	C+
Retail	Tesco PLC	GB	C+	Marks & Spencer Group PLC	GB	C+	Carrefour SA	FR	C+
Semiconductors	Intel Corp	US	B	STMicro-electronics NV	NL	B–	Texas Instruments Inc	US	B–
Software & IT Services	SAP SE	DE	B	Microsoft Corp	US	B–	International Business Machines Corp	US	B–
Telecommunications	Deutsche Telekom AG	DE	B	BT Group PLC	GB	B–	Telecom Italia SpA/Milano	IT	B–
Textiles & Apparel	Gildan Activewear Inc	CA	B–	Hennes & Mauritz AB	SE	B–	Industria de Diseno Textil SA	ES	C+
Transport & Logistics	Deutsche Lufthansa AG	DE	C+	Deutsche Post AG	DE	C+	(Royal Mail PLC)	GB	C
Transport & Logistics/Rail	Canadian National Railway Co	CA	B–	MTR Corp Ltd	HK	B–	East Japan Railway Co	JP	C+
Utilities	Terna Rete Elettrica Nazionale SpA	IT	B+	Red Eléctrica Corporación SA	ES	B	Suez	FR	B

With respect to the geographic distribution of the companies in the overall Universe with the best ratings from a sustainability perspective, European concerns continue to dominate: around 80 per cent are domiciled in Europe (although European companies only account for about a quarter of the companies in the overall Universe). Most of the companies in the Top 3 positions come from France, followed by Germany and the UK. These are followed by the USA and Sweden, ahead of the Netherlands and Japan.

As in previous years, the sustainability performances of no single company in the GLCU were sufficiently extensive as to warrant oekom research awarding the grade A in 2016.

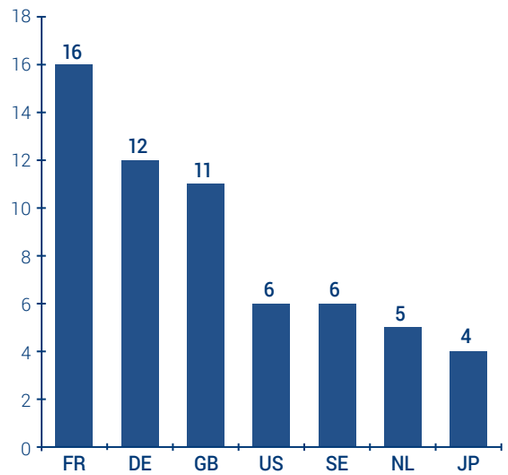

Fig. 7: Number of companies in Top 3 positions, by country of origin; basis: GLCU; as at: 31 December 2016; source: oekom research (2017)

2. The dark side: companies on watch

2.1. Controversial business practices in the spotlight

Economic activity has multifaceted effects on nature and humankind. Here, it is apparent that society's expectations of companies have increasingly been departing from the pure role as an employer towards that of a responsible member of society. Companies should be role models which treat their staff respectfully, pay taxes, market authentic products and preserve the environment. They should observe moral standards, even when not legally obliged so to do. Transgressions in these areas have resulted in mounting outrage in society and the media. Investors, too, are paying greater attention to companies' compliance with relevant minimum standards—not only in pursuit of their own ethical values, but also increasingly in response to companies' newly ascribed responsibility—for non-compliance also harbours pure material risks. Aside from the reputational aspects, nowadays corporate misconduct in some areas can also result in draconian penalties—such as for corruption, price fixing, but also fraudulent declaration of product characteristics, as highlighted by the Volkswagen (VW) scandal.

The sphere of responsibility ascribed to companies has also grown significantly over the past years. The UN Guiding Principles on Business and Human Rights, for example, unambiguously define the contributory responsibility which companies hold for the indirect impact their entire value creation chains have on labour and human rights. In some cases, companies are already legally bound to report on the measures they take to protect these rights. And, frequently, liability for breaches of labour and human rights in the supply chain is also being brought into play.

The UN Global Compact (UNGC)[4] is the world's foremost corporate self-commitment to responsible corporate governance. Many of the companies which oekom research analyses have acceded to the UNGC. It consists of ten universal principles outlining minimum standards for four thematic dimensions: human rights, labour standards, environmental protection and corruption prevention. In the course of its controversy screening, oekom research looks into a wide range of topics including companies' adherence to the Global Compact's four dimensions. In doing so, distinctions are made between various severities of controversy to enable a differentiated assessment of the controversial behaviour. The following assessments relate to controversies which, in oekom research's opinion, constitute severe and very severe breaches of the UNGC. Any additional references to moderate controversies are noted explicitly.

Only those controversies are covered for which reliable information exists from credible sources. Not only provable, but also purported, corporate behaviour and activities are assessed; in this case, however, analysts specialised in this field must, on the basis of these sources and in light of their experience, have deemed the facts and indications sufficiently reliable. Here it should be noted that, with public and media scrutiny more frequently focussed on large, international companies, relevant information is frequently available in greater quantities for these concerns than for less-prominent companies.

The following overview shows the share of companies in the various industries for which oekom research identified ongoing, severe or very severe controversies in at least one of the Global Compact's four thematic dimensions:

This year, the most controversial industries were again identified to be in the raw materials segment. Inglorious frontrunner is the Oil & Gas Equipment/Services industry, in which six out of ten companies are affected by controversies. This is followed by Oil, Gas and Consumable Fuels, and Metals & Mining. Were moderate controversies also to be included for the latter two, the share would rise from 47.9 per cent to 70.4 per cent, and from 39.0 per cent to 61.0 per cent respectively. According to these findings, controversial conduct and, therefore, conflicts with the substantive principles of the Global Compact—to which many of this industry's companies have acceded—are on the daily agenda.

The extraction of raw materials is not only commonly accompanied by land usage conflicts and associated human rights violations; the operation of mining equipment is in many cases also a threat to sensitive ecosystems and local inhabitants' livelihoods. Mining activities also often involve serious hazards

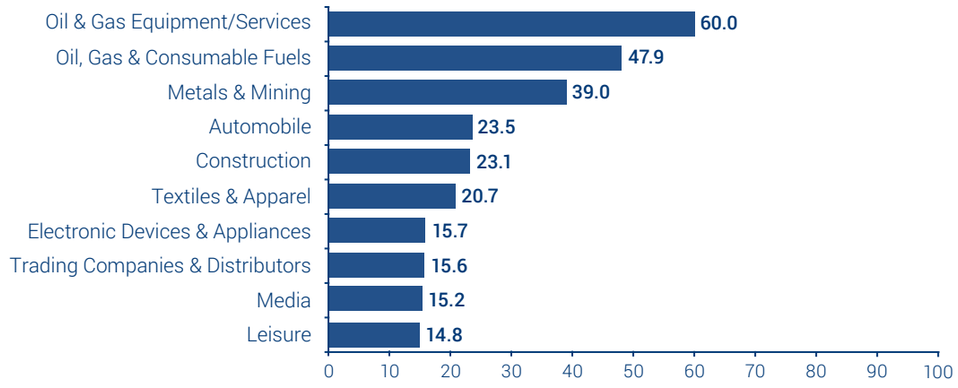

Fig. 8: Share of companies in the Top 10 industries with severe or very severe controversies with respect to the principles of UN Global Compact; in %; as at: 31 December 2016; source: oekom research (2017)

for the workforce, resulting in a relatively high number of fatal work accidents. The problem is exacerbated further by mining areas often being situated in developing and emerging countries with inadequate minimum standards in the areas of the environment, labour and human rights.

The reasons for the Automobile sector's fourth place is much less a structural issue (which is the case for the raw materials sector), but rather the result of contemporary, temporally limited incidents such as the emissions-manipulation scandal and individual cases of labour rights violations. In contrast, the Construction industry's problems are far more structural and the prominent position in the ranking is ascribed to various cases of corruption and labour rights violations.

Besides the companies in the raw materials segment, a further spate of controversies can be found in industries in which, due to the outsourcing of production to low-income countries, internationally recognised minimum standards are regularly violated in the supply chains. This is the case in the Textiles & Apparel and Electronic Devices & Appliances sectors, for example.

From a purely Global Compact-based perspective, oekom research concluded that Wilmar International Ltd , an agriculture company based in Singapore and the largest palm oil concern worldwide, was by far the most controversial company in 2016. This conclusion is based on a methodological instrument known as the oekom Controversy Score which serves as a measure of the number and severity of the current controversies associated with each company in the oekom research database: in doing so, oekom research uses a proprietary system to evaluate and assign a weighting to each circumstance which it deems controversial; these individual values are then aggregated into a final overall score. Based on this logic, it calculated a record score of –138 points for Wilmar at the end of 2016. This is ascribed primarily to the operation of many controversial palm-oil plantations (both proprietary and belonging to suppliers) for which–according to NGO and media reports–extensive areas of primary rainforests were cleared (including orang-utan habitats in Indonesia), on which extremely poor working conditions frequently prevail (e.g. child labour), and which in several cases have resulted in human rights problems (e.g. land-usage conflicts)[5].

Following some distance behind, with a score of –94, was Brazilian mining company Vale SA. At the end of 2015, one of the worst-ever environmental disasters in Brazilian history struck at an opencast mine where two dams of a tailings basin burst, releasing over 60 million cubic metres of iron-ore tailings. The mudflow extended 440 kilometres down the Rio Doce, Brazil's fifth largest river system. In addition, according to NGO and media reports, the company has also attracted attention over the past years for other mining projects involving inadequate labour-, human-rights and environmental standards and accidents[6].

In third place at the end of 2016 was mine operator BHP Billiton with a score of –64. BHP was also involved in, amongst others, the Rio Doce mining project.

Sources:

4 https://www.unglobalcompact.org/what-is-gc/mission/principles

5 e.g. https://www.amnesty.org/download/Documents/ASA2151842016ENGLISH.PDF and http://www.wilmar-international.com/sustainability/wp-content/uploads/2016/06/160627_Grievance-update.pdf

6 e.g. http://www.ohchr.org/en/NewsEvents/Pages/DisplayNews.aspx?NewsID=16803&LangID=E , http://www.dw.com/en/clearer-picture-emerging-over-brazils-mining-disaster/a-19006554 and http://www.mst.org.br/2015/06/10/vale-e-condenada-a-pagar-rusd-804-milhoes-por-acidentes-de-trabalho.html?O_NewsItemLinks1Dir=Asc&s_O_NewsItems_Id=411422

2.2. Corruption

In November 2016, anti-corruption organisation Transparency International presented the findings of the Global Corruption Barometer 2016[7]. In 42 countries throughout Europe and Asia, representative popular opinion polls were conducted to establish public perception of the level of corruption in individual areas of society. While in Germany and Switzerland corruption is not generally seen as a central problem in each respective country (this contrasts sharply with Spain, where two thirds of the population see corruption as one of the three top problems), the perception was significantly more negative with respect to business and industry. One third of the respondents in Germany suspect that top management of all, or most, large companies is involved in corrupt machinations. Although this is only a subjective impression of the population, the results show that a series of scandals in industry–be it the VW scandal or the seemingly unending series of stiff fines imposed on international commercial banks for legal and regulatory violations–has appreciably damaged confidence in corporate integrity.

According to Transparency International, corruption not only causes material damage, but also undermines the foundations of society. And because, apart from the concrete perpetrators and profiteers (namely the briber and bribee), the victim groups (e.g. taxpayers and competitors) mostly remain abstract, there is frequently no pressure to disclosure the perpetrations. Accordingly, the estimated number of unkown cases ist high.

However, evidence of corrupt practices repeatedly comes to light. Contributing to this are statutory regulations, such as the Foreign Corrupt Practices Act in the USA which, for many exposed incidents, has served as the basis for severe fines and settlement amounts. In December 2016, for example, Brazilian chemicals company, Braskem, agreed on a USD 957 million settlement after being indicted for paying kickbacks to Brazilian oil group, Petrobas, over a period of many years[8]–a scandal which sent shockwaves through Brazil and which even rocked the central government.

Also in December, Israeli pharmaceuticals group Teva Pharmaceutical Industries reached a USD 519 million settlement with the US Department of Justice: according to the indictment, the company had bribed government officials in Russia, Ukraine and Mexico over a ten year period in order to boost sales and secure regulatory approval.[9] In March 2016, Japanese medical technology company, Olympus, reached a USD 646 million settlement with the US Department of Justice for making improper payments to medical practitioners and clinics in the US and Latin America.[10]

The examples highlight that the Health Care sector, amongst others, is especially susceptible to corrupt practices. On the one hand, huge sums of money are involved–in Germany, for example, over ten per cent of the country's gross national product (GNP) is pumped into healthcare[11]–while, on the other hand, the system is highly complex and opaque, which fosters misuse. For these reasons, the Pharmaceuticals & Biotechnology and Health Care Equipment & Supplies sectors are again among the most controversial industries in the current ranking.

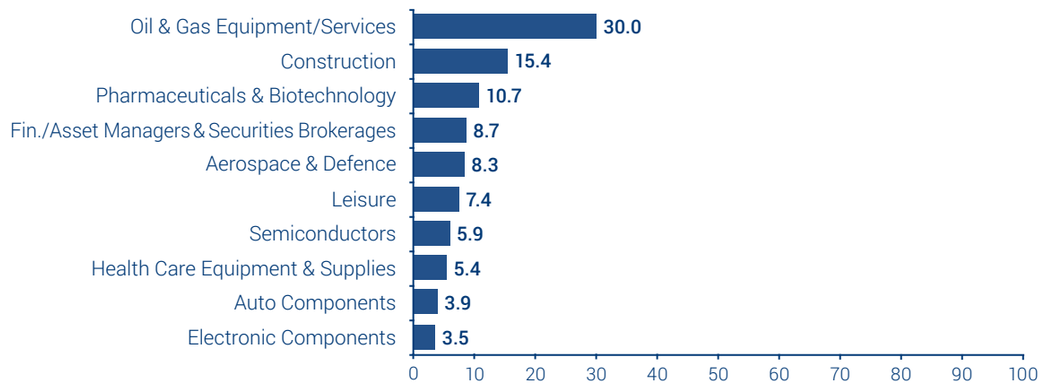

Fig. 9: Share of companies in the Top 10 industries with severe or very severe controversies in the area of Corruption; in %; as at: 31 December 2016; source: oekom research (2017)

Similarly to last year, the ranking is topped by two industries representative of the other major problem area: infrastructure projects. These generally involve huge order amounts and highly complex and protracted projects. Particularly in the oil sector, the projects are also frequently realised in developing and emerging countries which are highly prone to corruption. oekom research identified severe controversies at 30 per cent of the service companies in the Oil & Gas Equipment/Services sector. The Construction sector follows with a good 15 per cent.

The scores rose year on year for all of the Top 3 industries. "Climber" of the year is the Asset Managers & Securities Brokerages sector, after individual American asset managers were recently forced into eight-digit settlements with the US Securities And Exchange Commission (SEC) for unfair practices for winning orders.

Sources:

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9 https://www.justice.gov/opa/pr/teva-pharmaceutical-industries-ltd-agrees-pay-more-283-million-resolve-foreign-corrupt

10 https://www.justice.gov/opa/pr/medical-equipment-company-will-pay-646-million-making-illegal-payments-doctors-and-hospitals?O_NewsItemLinks1Dir=Asc&s_O_NewsItems_Id=5391802

11 https://www.transparency.de/Gesundheitswesen.61.0.html

2.3. Labour rights controversies

Breaches of fundamental labour rights still remain commonplace in some countries and industries. Even if the general level of standards employed by many capital-market companies is relatively good, conditions constituting a violation of internationally agreed minimum standards can frequently be observed, especially in the supply chains. This generally involves health-threatening working conditions and poor workplace safety, excessive overtime and extremely low wages. Furthermore, instances of child labour and "modern-day" slavery, e.g. in the form bonded labour, are repeatedly uncovered.

Labour rights controversies are not, however, limited to suppliers in developing and emerging countries: a whole string of listed mining companies, for example, record several dozen fatal accidents each year in their regular operations—often without any recognisable trend towards improving the situation.

At an international level, the International Labor Organization (ILO) is responsible for formulating and enforcing working standards—as a part of fundamental human rights. These standards aim to ensure employees' rights at the workplace and thereby ensure humane employment for everyone worldwide. The central ILO standards are the eight so-called core conventions centring on the following topics:

- banning forced and compulsory labour,
- freedom of association and the right to collective negotiation,
- the right to equal opportunity and equal treatment in employment and occupation,
- minimum employment age and ban on the worst forms of child labour.

The ILO's international Labour Code contains core working standards as well as numerous other rights including conventions on minimum wages and remuneration rules, work and rest periods, paid holidays, pregnancy and maternity protection, protection of special groups of persons such as migrant and home workers, occupational safety, dismissal protection and social security.

The following figures show that there is considerable potential for improvement in the situations of many working people:

- According to the ILO, over 2.3 million people are killed worldwide through workplace accidents or work-related illnesses each year.[12]
- The global share of workers living, together with their families, below the poverty line of less than two US dollars a day is around one quarter.[13]
- According to ILO figures from 2015 (derived from studies for the years 2004–2008), there are 168 million working children worldwide. Over half of them work in jobs which are classified as hazardous.[14]
- According to ILO figures, around 21 million people currently live in conditions in which their fundamental basic rights are violated in forced labour and slavery.[15]

The ILO figures are underpinned by numerous reports which oekom research looked into in the course of its research:

- In October 2016, a BBC documentation[16] brought to light that Syrian refugees were being exploited in factories of Turkish suppliers to European retailers and textiles companies such as Inditex and Marks & Spencer. The illegally employed persons were being paid less than the Turkish minimum wage and, in some cases, were forced to work with hazardous chemicals used for bleaching jeans without suitable protection.

- In Amnesty International's "The Great Palm Oil Scandal"[17] report, which was published in November 2016, the NGO documents cases of child labour and other violations of labour rights on palm oil plantations of two subsidiaries and three suppliers of the Asian agriculture concern Wilmar International in Indonesia. The foodstuffs and consumer-goods manufacturers Colgate-Palmolive, Kellogg, Nestlé and Reckitt Benckiser confirmed that they have sourced and used significant amounts of palm oil from Wilmar's respective refineries.

- At the end of June 2016, the internationally recognised NGO China Labor Watch published a report[18] on working conditions at Dongguan Chenming Electronic Company (Chenming), a Chinese supplier of PC and laptop casings for various companies, including Asustek and Fujitsu. According to the report, employees in the production process had to work in excess of 15 hours a day and had just one free day a month; regular overtime frequently amounted to as much as 40 hours a week. A penalty system was also in place which punished workers with wage reductions, e.g. for absence from, or late arrival at, work.

Over the past years, developments have arisen in the discussion on companies' obligations regarding compliance with minimum working standards—also with respect to standards at suppliers. Despite the continuing lack of an established catalogue of human and labour rights that is globally binding for companies, the UN Special Representative for Business and Human Rights, John Ruggie, held for the first time a broad dialogue on human rights with all relevant stakeholders; following its conclusion at the end of 2011, the dialogue culminated in the UN Guiding Principles on Business and Human Rights. While these are not legally binding, corporate responsibility—including responsibility for indirect effects across the entire value-creation chain—was fixed in writing.

In practice, companies' activities are primarily regulated by the underlying legal requirements of the countries in which they operate. If compliance with these rights is not implemented or enforced in these countries, neither national (i.e. the country of corporate domiciliation) nor international jurisdictions prescribe adequate obligations under which companies can be prosecuted for a criminal breach of labour laws. A number of national legal initiatives—such as the UK Modern Slavery Act—have, however, been recently passed which at least impose transparency obligations on companies with regard to very severe labour rights problems, thereby increasing the pressure of public reputation for them.

Moreover, the question of violations of labour rights in the supply chain is increasingly being broached. In the course of implementing the UN Guiding Principles for Business and Human Rights through national action plans, current discussions are broaching the introduction of laws for establishing binding human rights due diligence obligations for companies. At the end of 2016, for example, a civil suit, which was brought by victims of a factory fire in Karachi, Pakistan, which killed 260 people, was admitted in Germany. The defendant is the German textiles discount

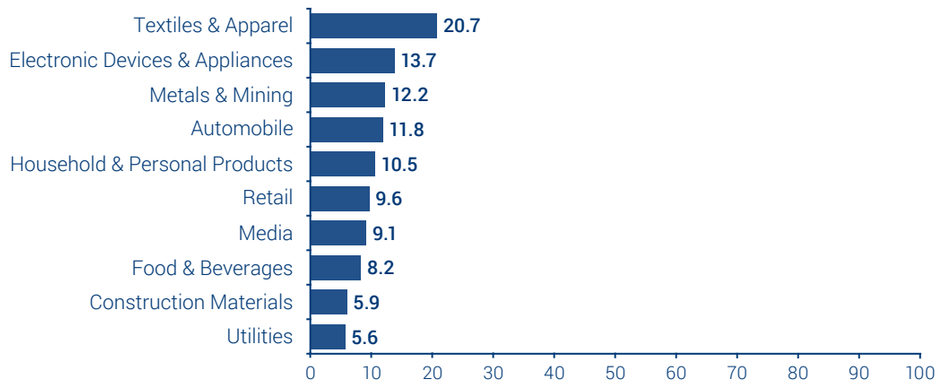

Fig. 10: Share of companies in the Top 10 industries with severe or very severe controversies in the area of labour rights; in %; as at: 31 December 2016; source: oekom research (2017)

chain KiK as the factory's principal. Should the court award damages to the victims, this could be a landmark ruling with respect to companies' liability for breaches of working standards by their suppliers, and thereby further increase the relevance of the topic for investors.

A glance at the most controversial industries in 2016 shows a similar picture to 2015. The situation still remains most acute in the Textiles industry, even though the value has fallen from 25 per cent to a approximately 20 per cent. But if moderate controversies are also included, almost 40 per cent of the companies are affected. The share of affected companies has risen appreciably in the Electronics Devices & Appliances sector which also outsources production to low-income countries on a large scale: within the space of a single year, the value almost doubled to 13.7 per cent. New controversies at suppliers to companies such as Fujitsu and Panasonic contributed to this development. New among the Top 10 is the Household & Personal Products industry, primarily due to labour rights problems at Wilmar International, the largest supplier of palm oil. Still amongst the three most controversial industries—with a 12.2 per cent share, but below last year's level—is the Metals & Mining industry: work at opencast pits and underground mines is often hazardous; also, the safety standards in the extraction areas, which are often located in developing and emerging countries, are not always adequate. This results in a large number of fatal accidents that afflict mining companies each year.

Sources:

12 http://www.ilo.org/global/topics/safety-and-health-at-work/lang--en/index.htm

13 http://www.ilo.org/global/topics/economic-and-social-development/lang--en/index.htm

14 http://www.ilo.org/global/topics/child-labour/lang--en/index.htm

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16 http://www.bbc.com/news/business-37716463?O_NewsItemLinks1Dir=Asc&O_NewsItems1Dir=Asc&s_PublishOnPortal=1&s_Heading=Marks+%26+Spencer+Group?O_NewsItemLinks1Dir=Asc&s_O_NewsItems_Id=6337084

17 https://www.amnesty.org/en/documents/asa21/5184/2016/en/

18 http://www.chinalaborwatch.org/upfile/2016_06_20/UNEEC%20Full%20Report.pdf

2.4. Human rights controversies

International conventions such as the United Nations' Universal Declaration of Human Rights are generally based on a broad interpretation of human rights which also encompasses, e.g. labour rights. oekom research analyses this area separately to reflect the importance of labour rights in the economy. According to oekom research's definition, human rights violations thus chiefly affect the basic rights of the individuals outside the rated companies who are detrimentally affected by the companies' behaviour or activities.

Against this background, examples of severe human-rights controversies include:

- massive physical violence, threat or intimidation, as well as uncompensated expropriations or forced resettlements to the company's gain, either through the company itself, its security service provider or also through governmental bodies, as well as the commissioning or active support of such actions
- destruction of inhabitants' livelihoods through intentional or grossly negligent environmental pollution and/or destruction
- actions in which massive damage to the inhabitants' health or lives is tolerated
- actions which massively flout the right to self-determination, including the cultural rights, of third parties
- complicity in human rights controversies by forwarding data or delivering critical technologies to authoritarian regimes.

Analogously to the principles for labour rights, the UN Guiding Principles for Business and Human Rights also affirm companies' explicit responsibility for all other human rights, which also applies to the enitre value-creation chain. According to the then UN Special Representative for Human Rights, John Ruggie, companies have a due diligence obligation to respect human rights in all their activities. According to the Guiding Principles, companies remain responsible for preventing negative consequences for human rights, even if they do not directly contribute to these consequences themselves, but are, e.g. associated indirectly with a human-rights violation via a business relationship. Despite the wide range of countermeasures, human rights will continue to be impaired in

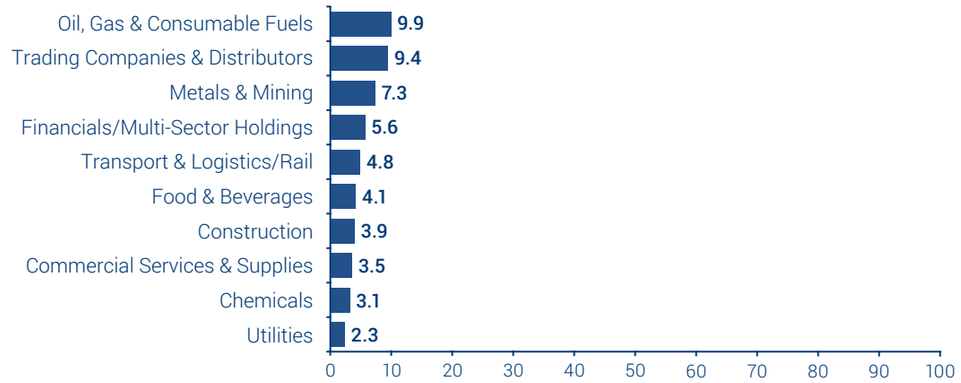

Fig. 11: Share of companies in the Top 10 industries with severe or very severe controversies in the area of human rights; full listing of the affected industries; in %; as at: 31 December 2016; source: oekom research (2017)

practice; therefore, companies should ensure the implementation of complaints mechanisms through which problem areas can be recognised and, following a damaging event, the affected parties can be suitably compensated.

The topic is becoming ever-more explosive because, in the course of globalisation, companies are—either themselves or via suppliers—increasingly operating in countries in which human rights are not enforced or implemented. Against this background, problems frequently arise in the area of land-usage conflicts: land—and particularly land which can be used for agriculture—is a limited resource that is becoming continually scarcer, e.g. due to population growth and the concomitant loss of fertile land through land degradation and climate change. Instances of conflicts related to the usage of water reserves are also rising. At the same time, different land-usage types are in competition, such as natural-resource extraction versus use for foodstuff production. Consequently, in some countries, especially in Africa, Asia and Latin America, cases repeatedly arise in which mining/oil companies and investors buy up arable land on a large scale ("landgrabbing"), evicting the indigenous population which traditionally works such land areas, and depriving them of their livelihoods—often without proper compensation. As an example, for some decades now, protestors have been venting their opposition to the Camisea gas project in Peru[19]. This project, which is of prime economic importance for the country, is currently being expanded into a region that was created as a sanctuary for hitherto un-contacted indigenous peoples in 1990. Economic activity in this region is prohibited under high-court rulings. But even the protest of the United Nations has been unable to stop the expansion thus far. Among others, Spanish oil conglomerate Repsol is one of the members of the operator consortium. Another example is Indian coal company Coal India: the investigation report on the violation of indigenous peoples' human rights, which was published by Amnesty International India[20] in July 2016, comes to the conclusion that, in the course of expanding coal-mining projects, Indian authorities forced thousands of people to relocate without proper compensation. Coal India, which benefited economically from the forced relocations, was aware of, and even partially assisted, the measures.

As in past years, violations can primarily be observed in the extractive industries due to the large land areas required. The high controversy rating of the Trading Companies & Distributors industry results from the fact that, in particular, several of the large Japanese companies in this sector were involved in controversial forced relocations in the course of mining activities or the creation of special economic zones in developing countries (especially in Myanmar) over the past years.

Even if "only" around every tenth company in the most controversial industries is encumbered by a severe controversy, a glance at the moderate controversies highlights that human rights violations are unequivocally a structural problem in certain industries: with this extended view, for example, the value for the Metals & Mining industry rises from approximately 7 per cent to almost 25 per cent.

Sources:

19 e.g. https://www.theguardian.com/environment/andes-to-the-amazon/2016/jun/02/pioneer-gas-latin-america-indigenous-peoples

20 http://www.amnestyusa.org/sites/default/files/report_final.pdf?O_NewsItemLinks1Dir=Asc&O_NewsItems1Dir=Asc&s_PublishOnPortal=1&s_O_AlertStatuses_Id=7&s_O_Inboxes_Id=2?O_NewsItemLinks1Dir=Asc&s_O_NewsItems_Id=5934334

2.5. Environmental controversies

Economic activities are generally associated either directly or indirectly with harm to natural resources. Problems are not only caused by often hugely excessive overuse, but also by the continual and partially irreversible pollution of the environmental media air, water and soil – be it via air pollutants caused by fossil fuel-based power generation, the contamination of ground water by heavy metals from mining industry tailing ponds, or the degradation of soil quality through the agricultural use of fertilisers and pesticides. The continued pollution of environmental media and extensive re-designation of land areas, e.g. for opencast mining, human settlement and traffic areas, and agricultural areas is permanently diminishing the natural habitats of animals and plants, the correct functioning of ecosystems and, thereby, the provision of ecosystem services such as self-purification, microbial degradation, pollination and groundwater formation.

Damage is being caused on a massive scale: were companies charged for the damage they inflict on the environment and biodiversity on a polluter-pays basis, the world's largest 3,000 companies would – according the UN Environment Programme's calculations – have to set aside over 50 per cent of their revenues[21]. At the same time, however, companies rely on properly functioning ecosystems and access to uncontaminated environmental media, e.g. in the form of clean/usable water as an operating resource or as a raw material for their products.

Many environmental aspects are already regulated by appropriate legislation which is often based on the principles of "precaution" and "polluter pays": under the principle of precaution, appropriate contingency measures must be taken beforehand to prevent possible damage. The polluter-pays principle states that the cost of eliminating and compensating for environmental damage be borne by the party that caused it. Consequently, companies can also be held liable for damage caused. These principles do not yet, however, apply in all countries and to all economic activities.

According to oekom research's definition, controversial environmental behaviour is given in this context in particular when: a company significantly and demonstrably or purportedly flouts generally-recognised environmental protection norms, principles and standards in its sphere of influence; or if, as a result of the company's behaviour, significant environmental damage has been directly or indirectly caused or exacerbated. Examples of controversial environmental behaviour are projects, practices and incidents which are operated or promoted by the company and result in disproportionate damage to the environment. This includes, inter alia, significant negative consequences for the natural resources and ecosystem of the area concerned, e.g. due to serious or irreversible contamination of environmental media by chemicals or the like, or harming of the basic needs of protected and/or endangered species.

In some cases, relevant circumstances are based on massive, one-time incidents such as the late-2015 Rio Doce damburst mentioned earlier, for which, inter alia, BHP Billiton and Vale were responsible. In many cases, however, it is not accidents which are the cause but, rather, regular business activities and projects with corresponding, severe environmental consequences that are tolerated as collateral side-effects. These include just as much the large-scale clearance of primary rainforests for re-designating the land for palm oil plantations by palm oil concerns such as Wilmar International and Golden Agri-Resources and its suppliers, as they do controversial mega-dam projects such as Belo Monte in Brazil involving participation of companies such as Spain's Iberdrola and Brazil's Petrobras, or the extensive use of high-volume fracking for extracting, e.g. shale gas by many oil and gas companies.

Similar to human rights problems, most environmental controversies emanate as a result of the activities and locations of the raw-materials industries. Particularly the extraction and treatment of the raw materials, the associated construction and expansion of the relevant infrastructure (e.g. roads and pipelines) and the storage and disposal of contaminated spoils and tailings have a negative impact on flora and fauna, as well as on the air, water and soil.

Over 40 per cent of the companies in the Oil, Gas & Consumable Fuels sector are embroiled in such controversies, as well as approximately 34 per cent in the Metals & Mining sector. If moderate controversies are also included, the shares rise to 67 per cent and almost 50 per cent respectively. Thus, structural problems are also rife in these areas. But with many of the world's untapped raw materials located in sensitive ecosystems, and future demand for raw materials expected to remain high, environmental controversies will also likely continue to afflict these industries for years to come.

Elevated values are also observed in the Automobile and Financials/Multi-Sector Holdings industries, where approximately ten per cent of all companies are affected. In the Automobile industry, this can be ascribed to the emissions-manipulation scandal which impacted several manufacturers. In the Financials / Multi-Sector Holdings industry, under which investment companies are also grouped, some companies have stakes in organisations responsible for controversial deforestation in south-east Asia.

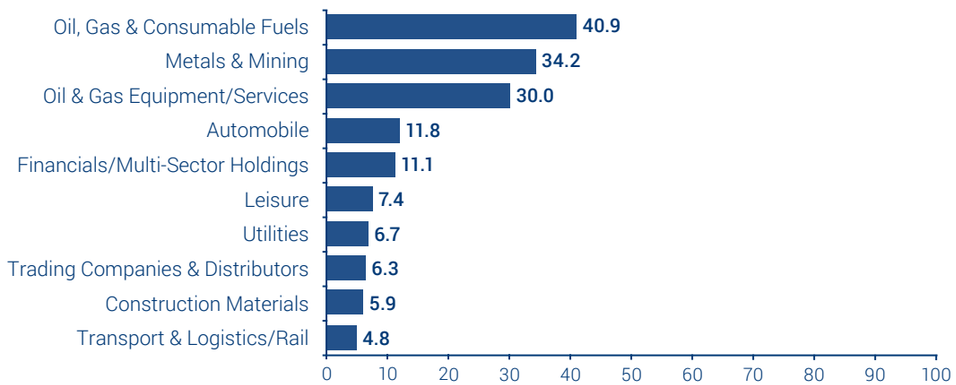

Fig. 12: Share of companies in the Top 10 industries with severe or very severe controversies in the area of the environment; in %; as at: 31 December 2016; source: oekom research (2017)

Sources:

21 http://www.unepfi.org/fileadmin/documents/universal_ownership_full.pdf

3. Transformation processes: opportunities and risks for companies

Transformation processes, in other words the developments in the fundamental economic, social and political conditions taking place concurrently or independently in many areas, are associated with changes, in some cases incisive in their nature. Automation, to take one example, has made many jobs in the industrial sector redundant over the past decades. In other areas, transformation by automation, digitalisation and artificial intelligence has only just begun: the Institut für Arbeitsmarkt und Berufsforschung (Institute for Employment Research) arrived at the conclusion that today only 40 per cent of the working population in Germany subject to mandatory social insurance have jobs in professions that cannot or can only partly be replaced by computers or robots[22]. Conversely, this means that well over half of the people who make up the working population are indeed at risk of being displaced from their jobs by machines in a process referred to as substitution. In many other areas too, in which human beings have so far been considered irreplaceable – in particular in jobs that require empathy or creativity or that are otherwise characterised by especially complex and demanding situations – automation is making ever greater inroads, for example in the form of driverless cars. Even if not everything that is actually feasible is currently being implemented, structural upheavals due to new technologies are already foreseeable. While so far it is the industrial production sector that has been most affected, this transformation will also make an ever greater impact in the services sector in the future.

Another complex of issues that is also subject to such profound change is that of decarbonisation – in other words the conversion of energy systems, in particular, to carbon-free or carbon-low alternatives as a measure to contain global warming. Far-reaching national and international commitments and the tightening of the regulatory framework are setting a new course, thus redefining the borders of companies' room for manoeuvre.

Such processes of transformation open up opportunities for existing and new models, but also risks when companies are not capable of adapting to new circumstances. The following papers thematise a range of trends that are of importance against this background. Selected business sectors have been taken as examples to illustrate the extent to which companies are geared for these changes. They also show exactly where the environmental and social risks lie that may have an increasing impact on economic success in the future. The focus of the perspective is on transformation processes that are triggered by environmental or social challenges and crises.

Sources:

22 http://doku.iab.de/kurzber/2015/kb2415.pdf

3.1. Contributions of companies' product portfolios to sustainable development

The SDGs in the debate on sustainable investments

Almost one-and-a-half years after the adoption of the SDGs, a first interim conclusion can be drawn: companies and investors alike are moving forward to follow the appeal of the international community for greater engagement in sustainability issues. This is necessary since the additional two to three trillion euros that will be required each year to achieve the 17 goals and 169 targets by the year 2030 cannot be raised without the active support of companies and especially the capital market. Already in 2015, 41 per cent of the approximately 1,000 globally active companies surveyed by PwC stated that they wish to actively integrate the SDGs into their business strategy within five years.[23] It remains to be seen, however, just how these declared intentions, which in many cases are still relatively vague in their details, will be translated into verifiable action in the coming years.

As a potential framework for shaping sustainable financial investments, the SDGs have also been welcomed surprisingly positively by the investment community. Examples for this are the commitments of major institutional investors such as APG, PGGM, Actiam, and Kempen to create so-called "Sustainable Development Investments" (SDIs). In other words, a commitment to the active investment in sustainability solutions with a positive contribution to achieving the SDGs.[24,25]

At the start of 2017, financial services provider UBS pledged to offer a broad spectrum of new, SDG-aligned impact investments. In the White Paper that the company published on this programme, the asset manager criticised a deficit of reliable information on SDG investment requirements and opportunities as being a central obstacle for greater engagement on the part of the private sector.[26]

The extensive, complex, and in some cases mutually contradictory SDGs must be simplified, if they are to serve as a framework concept for sustainably oriented investments. Furthermore, ways must be found by which individual companies' contributions towards the achievement of the SDGs can be rendered measurable and evaluable.

Minimise risks, seize opportunities

The UN Global Compact captures the contribution that companies and investors can make towards achieving the SDGs in a simple formula: *"Business contribution to the SDGs = act responsibly + find opportunity"*.[27] This formula also transparently sets out the priorities of these two aspects:

1. Act responsibly

- Responsible business conduct within the current business model
- Reduction of negative impacts on people and the environment by observing minimum standards in areas such as labour and human rights, environmental protection, and business ethics

2. Find opportunity

- Seizing new market opportunities resulting from the impulses provided by the SDGs
- Development of innovative products and services that directly contribute toward the achievement of the sustainability goals

The ensuing impulses for transformation and regulatory developments should be considered early on in the process of structuring investment portfolios. The challenge for investors here is not only to consider companies' risk-management aspects regarding sector-specific sustainability challenges when making their investment decisions. With "find opportunity," the SDGs have given additional impetus to the trend of "impact investing" that has long been apparent in the area of sustainable investment: an increasingly relevant aspect in the investment-decision process is the question of whether and how a company's products and services directly contribute to sustainable development. Rating and research data that only looks at risk management and good corporate governance would fall short of the mark in this respect, and should be supplemented with a precise and detailed analysis of the entire product portfolio.

In many sectors, the sustainability quality of the products and services that a company offers has long been included in the overall assessment of the oekom Corporate Rating[28]. In 2016, on the basis of the SDGs, the oekom Sustainability Solutions Assessment was developed as a method that enables an industry-overarching, uniform and systematic capture and assessment of the sustainability contribution made by a company's product portfolio. This serves to provide investors with a comprehensive assessment of a company's overall sustainability performance – both in terms of corporate governance and the company's environmental and social performance as well as its product and service portfolio.

Aligned with the SDGs: the product assessment methodology

As the UN SDGs primarily target national states, not all of the goals are equally relevant for companies – especially from a product and service perspective. For this reason, oekom research defined a total of fifteen sustainability objectives which are closely aligned with the SDGs and can be used to assess companies' product portfolios in terms of their contribution towards sustainable development.

7 social objectives and their corresponding UN SDGs	8 environmental objectives and their corresponding
• Alleviating poverty • Combating hunger and malnutrition • Ensuring health • Delivering education • Attaining gender equality • Providing basic services • Safeguarding peace	• Achieving sustainable agriculture & forestry • Conserving water • Contributing to sustainable energy use • Promoting sustainable buildings • Optimising material use • Mitigating climate change • Preserving marine ecosystems • Preserving terrestrial ecosystems

Fig. 13: The 15 objectives of the oekom Sustainability Solutions Assessment.

For each individual objective, a qualitative analysis is conducted to determine whether a product or service category makes a significant or limited net positive impact on attaining the objectives ("contribution"); whether it has neither an explicitly positive nor an explicitly negative impact due to overlaying factors or factors dependent on other parameters ("no net impact"); or whether it even acts as a moderate or significant obstacle to attaining the objective ("obstruction"). Finally, the ratio of each thus-classified product and service category to the company's total revenues is stated.

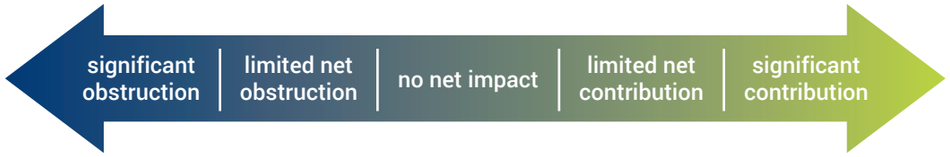

Fig. 14: The five categories of the oekom Sustainability Solutions Assessment.

The ensuing dataset, yielding 75 data points per company, allows for the assessment of a company's entire portfolio based on the revenue shares achieved with relevant products and services relative to the individual objectives; in this way, it is possible to take into account the different effects of individual products on the various conservation assets. It is also possible to illustrate whether and how positive effects of one product group are offset by the negative effects of another group, possibly even in relation to another objective.

Selected results: How do companies contribute to the objective "Ensuring health"?

First results of the SDG-related product assessment are now available for the constituent companies of the Stoxx Europe 600 index (as at January 2017). The following describes and analyses a selection of results for these 600 companies in 17 European countries[29], with a special focus on the objective "Ensuring health". This is one of the seven social objectives defined by oekom research with respect to the product and service portfolios offered by companies (orientated towards SDG 3 – Good Health and Well-Being). Based on the World Health Organization's (WHO) official definition of health[30], this is interpreted as the endeavour to provide all people with the best possible cure for disease and affliction, and to ensure they achieve and maintain a state of full physical, mental, and social wellbeing.

Defined as making a significant contribution in this regard are products and services for the treatment of serious diseases, for ensuring survival, and for the integration of severely disabled people into everyday life (for example, products defined in the WHO list as indispensible drugs, clinics, or medical devices for dialysis machines). Less distinct but, on balance, still positive (limited net contribution) is the contribution made by e.g. non-prescription drugs, protective equipment, healthy food products, condoms, or oral hygiene. Many products and services have no direct, clearly positive or negative impact on health aspects (no net impact) and are thus considered neutral (inter alia entertainment media, clothing, computers, or forestry products). Some products, however, also have demonstrably negative direct effects on human health. In some cases – for instance unhealthy food products, alcohol, or gambling – the impact is less pronounced (limited net obstruction) or depends significantly on the way in which they are used. Other products, e.g. tobacco products or weapons, have a much more direct, and frequently lethal, effect (significant obstruction).

Slightly over half (324) of the analysed Stoxx Europe 600 companies had at least single products or services with a direct relation to health aspects (positive or negative) in their portfolio. 216 companies offer products with a strongly, or at least moderately, net positive impact on health, while a total of 184 companies also market products with a slightly to strongly negative net impact on health. 76 companies have both positive and negative products on offer, thus exhibiting a portfolio that is mixed from a health perspective.

It can be concluded, however, that the share of revenues generated by relevant products and services is frequently very low.[31] 100 of the 324 companies with health-relevant products (approx. 31%) generate an estimated 1 per cent or less of their sales with products of this kind. In many cases, these are companies which tend to have relatively heterogeneous product portfolios.

Examples are:

- Banks and financial services providers offering special financing products for the healthcare sector as niche products or, in the negative spectrum, financial services for the military industry
- Machinery companies whose broadly diversified product ranges also include e.g. fire-alarm systems or catalytic converters
- Telecommunication companies with mHealth (mobile health) services or, in the negative spectrum, gambling services.

It is estimated that only 155 companies (approx. 25 per cent of all the surveyed index constituent companies) generate 5 per cent or more of their revenue with relevant products or services. There are, however, 114 companies (approx. 19 per cent) generating 20 per cent or more of their revenues with relevant products or services.

As is to be expected, the positive spectrum is occupied by industries such as pharmaceuticals, healthcare equipment manufacturers, and healthcare facility operators. Somewhat-more-diverse portfolios from a health perspective are offered particularly by companies in the food and beverages industry (cf. Section 3.6.) and wholesalers and retailers distributing relevant products such as alcohol, tobacco products, food products and pharmaceutical products on a large scale. The tobacco and defense industries

	+ contribution	– obstruction
	social objectives	
significant	• ensuring health: 1% medical device components (est.)	
limited	• ensuring health: 66% emission control technologies, pharmaceutical ingredients (est.)	
	environmental objectives	
significant		• contributing to sustainable energy use: 2% oil service provider (est.) • mitigating climate change: 2% oil service provider (est.)
limited	• contributing to sustainable energy use: 4% specialised parts for electric cars (est.) • mitigating climate change: 4% specialised parts for electric cars (est.)	

Fig. 15: oekom Sustainability Solutions Assessment for Johnson Matthey

stand out prominently for the especially large share of revenue generated by health-damaging products.
Only 13 per cent of the surveyed companies generate more than half of their overall revenues with health-relevant products and services (n = 78). These are almost exclusively found in the above-mentioned industries. However, there are a number of "out of the ordinary" players, such as automotive supplier Johnson Matthey—a company that generates two thirds of its revenue with emission-control technologies, pharmaceutical ingredients and components for medical devices. Another example is construction-materials manufacturer Geberit with an estimated 90 per cent of its business generated with sanitary products with a limited net positive impact. An example of high revenue shares at the negative end of the scale is the William Hill tourism group, almost all of whose product range (approx. 95 per cent) comprises forms of gambling with a particularly high potential for addiction.
Among the 20 companies (3.33 per cent) which generate 100 per cent of their revenues with relevant products are pharmaceutical companies and suppliers of healthcare equipment, as well as the operators of healthcare facilities, at the one end of the scale, and, at the other end of the scale, manufacturers whose portfolios consist entirely of alcoholic beverages or tobacco products.

Summary and outlook

Over the next few years, the SDGs will continue to assert their role as a conceptual framework for sustainable corporate governance and investment decisions, as is indicated by the endeavours currently being undertaken on a broad basis to render measurable economic stakeholders' contributions towards achieving the set goals.[32,33]
From oekom research's perspective, a comprehensive assessment of companies' sustainability performance always includes both risk management and corporate governance aspects, as well as the impact of their products and services on sustainability. As clearly shown in Sections 3.1. to 3.6., even companies that have implemented appropriate risk management structures can come under pressure from transformation processes if their product portfolios fail to keep pace.
The oekom Sustainability Solutions Assessment's comprehensive, SDG-related product analysis will therefore continue to be rolled out in the course of 2017. Its successive integration into the oekom Corporate Rating will also be supplemented by an assessment of the companies' pursued transformation strategies: how do these strategies tackle the impact their products and services have on sustainability? Will the portfolio change over the coming years? Have the companies set themselves e.g. measurable targets for boosting sales with sustainable products? Do any concrete plans exist for reducing or even phasing out products that are not sustainable? The companies' answers to these questions will be examined in the next CR Review.

Responsible analysts at oekom research:
Lisa Breitenbruch, Senior Analyst, and
Anne Meldau, Senior Analyst

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25 https://www.pggm.nl/wie-zijn-we/pers/Documents/Institutional-investment-into-the-Sustainable-Development-Goals-statement.pdf

26 https://www.ubs.com/global/en/wealth_management/chief-investment-office.html

27 https://www.unglobalcompact.org/docs/issues_doc/development/GCforSDbrochure.pdf

28 Examples of this include the energy mix for power generation at energy utilities, and the health and nutrition values of food products in the food industry (cf. Section 3.6.).

29 https://www.stoxx.com/index-details?symbol=SXXGR

30 http://www.who.int/about/definition/en/print.html

31 The revenue shares stated in the oekom Sustainability Solutions Assessment are based either directly on the figures published by the company concerned, or were otherwise estimated on the basis of the company's own financial, business-segment, or other reports.

32 http://www.businessfor2030.org/metrics-indicators/

33 http://businesscommission.org/our-work/new-report-how-the-world-can-finance-the-sdgs

3.2. Carbon risk rating: climate performance put to the test

Underlying conditions in the battle against climate change

According to the Intergovernmental Panel on Climate Change (IPCC), the global emission of greenhouse gases (GHG) will cause a rise in average temperature of more than 4° Celsius if allowed to continue to grow unabated at the current rate. The consequences of such a scenario would be devastating, resulting, for example, in sea levels rising by as much as one meter, or the flooding of entire island states and low-lying coastal regions. Furthermore, the effects of climate change that can already be observed today—for example diminishing biodiversity levels and the rising frequency of extreme weather events with all its associated consequences—will intensify even further. Furthermore, various studies conclude that, if allowed to continue unabated, climate change will result in horrendous economic costs in virtually every industry and country. According to the German Institute for Economic Research (Deutsches Institut für Wirtschaftsforschung, DIW), the cost of climate change in Germany alone could amount to EUR 800 billion by 2050[34], unless effective countermeasures are taken.
At the 2015 UN Climate Change Conference in Paris, the international community—confronted by these enormous risks and challenges—passed for the very first time an international resolution defining a target to contain the global rise in temperature to a maximum of 2° Celsius by the year 2100, also striving for an even tighter limitation to 1.5° Celsius. The unexpectedly swift passage of the Paris Climate Agreement in November 2016 was celebrated as a central milestone towards a fundamental transition to a low-carbon global economy. The Agreement's fundamental premise is: the later the turnaround in worldwide GHG emissions succeeds, the more intensive the reduction in global GHG emissions will have to be. The renowned think-tank, Carbon Tracker, quantifies the problem as follows: the global community has an overall carbon budget of 886 gigatonnes of CO_2 for the period 2000 thru 2050 in order to achieve the 2° Celsius target. Of this total, 321 gigatonnes were already emitted between 2000 and 2011, leaving a net budget of just 565 gigatonnes of CO_2 that may be emitted in the time remaining until 2050[35].
Against this scenario's background, initial indications of a positive development begin to appear in some areas. There is, for example, a growing trend towards pricing GHG emissions, both in the form of emissions-trading systems as well as by levying appropriate taxes. So far, 40 national and 24 sub-national instruments for GHG taxation have been established or are being planned worldwide (as at: October 2016). In 2016, these initiatives covered approximately 13 per cent of global GHG emissions in total, a proportion which has risen three-fold over the past ten years. If China succeeds in implementing its announced emissions-trading system in 2017, it is estimated that this share will rise further to 20 to 25 per cent. In addition, for 2017, an emissions-trading system is also being planned for Ontario, as are CO_2 taxes in Alberta, Chile, and South Africa[36]. It is anticipated that the Paris Climate Agreement will give further impetus to the inception of such initiatives, exerting yet more pressure on companies in all industries to follow suit.

Challenges of decarbonisation: inadequate strategies

For some time now, institutional and private investors have been noticeably withdrawing significant amounts of capital from fossil fuels. Various initiatives—such as the PRI Montreal Pledge, the Portfolio Decarbonisation Coalition, and the Global Investor Statement on Climate Change—have given a strong boost to the divestment and decarbonisation movement (cf. Section 3.5.). In addition, the International Standards Organisation (ISO) is planning to develop an internationally certified standard for climate performance, particularly targeting investors and political decision-makers. In view of these developments, one troubling aspect is the extent to which many economic stakeholders continue to underestimate the urgency of decarbonisation and the risk which climate change poses. Particularly problematic are the many imponderables accompanying the issue of climate change (e.g. regarding the exact timing and the severity of future impacts on the environment, or the exact extent of the financial costs involved) which continue to paralyse many companies. Moreover, entrepreneurial decision-making processes—in many

cases with very short-term horizons—also contribute to a false assumption: that the impact of climate change will only manifest itself in the distant future and that, consequently, it can be neglected for the moment[37]. In doing so, companies should above all consider that, while the battle against climate change indeed comes at a price, inaction today will lead to much higher costs in the future[38].

Are companies setting themselves the right goals?

The decarbonisation of the global economy and, simultaneously, the fundamental transformation of global energy supplies are already in full swing. Many industries, in particular the coal, oil and gas industries (cf. Section 3.5.), are particularly affected by these upheavals, forcing them to implement comprehensive transformation processes to address ever-increasing risks and future developments. One fundamentally positive aspect of this development is that approximately 5,800 companies now regularly report on their climate-protection strategies, GHG emissions and energy consumption to the CDP. These companies already represent 60 per cent of the global market capitalisation (as at: October 2016)[39].
Nevertheless, it must be borne in mind that such endeavours to ensure transparency can only be regarded as a first step on the path to adequately managing carbon-related risks. Meanwhile, growing numbers of companies are also using internal carbon prices to factor in current and future climate-protection regulations, and to align both their decision-making processes and their investment plans with the ensuing risks. These carbon prices must, however, be appropriately and realistically calculated and should not be too low. Another new development since the endorsement of the Paris Climate Agreement are "science-based targets" (see infobox) that are set by companies themselves. As of the end of January 2017, a total of 208 companies—including prominent multinationals such as the Kellogg Company, PepsiCo, Pfizer, Procter & Gamble, and Sony[40]—had publicly pledged to set their emissions-reduction goals based on of scientific evidence.
Among the key risk factors from both a corporate and investor perspective are the regulatory constraints imposed by climate-protection policy, technological progress and advances in the area of renewable energies, and the problem of "stranded assets". The latter can involve either past corporate investments in natural resources that may no longer be exploited due to revised regulatory guidelines, or technologies (e.g. fracking) which have been banned in some countries and may be banned in further jurisdictions in the future. Consequently, portfolio alignment with climate protection is increasingly becoming a fiduciary duty for investors, since changes in market conditions arising from the ever-increasing awareness of climate risks can, both in the short, as well as in the medium and long term, jeopardise yields and significantly erode the value of their portfolios. Examples of this are the interim drop in coal prices and the bankruptcy of formerly prominent coal companies (Peabody, Alpha Natural Resources, Arch Coal) over the past years, as well Exxon's late-2016 announcement to write down 20 per cent of its oil reserves as "stranded assets".

Science-based targets

- Joint initiative of CDP, UN Global Compact, WRI, and WWF
- Corporate emissions-reduction goals orientated towards the 2° Celsius target of the Paris Climate Agreement
- Goals not developed arbitrarily, but based on scientific evidence
- The Sectoral Decarbonisation Approach (SDA) offers companies an industry-specific approach for calculating their goals, taking into account industry-specific differences in reduction potential and costs

Assessing climate performance: only an overarching picture is meaningful

Companies often overlook two central aspects when accounting for, and taking the most effective mitigation measures with regard to climate risks. In many cases, inappropriate or inadequate criteria and system boundaries are chosen. This can manifest itself, e.g. in a limitation to Scope 1 and Scope 2 emissions which reflect a company's direct carbon footprint (including its electric power consumption). Indirect Scope 3 emissions and the associated risks arising along the entire value-creation chain—which also fall within the company's responsibility—are, by contrast, essentially neglected. Emissions in the upstream extraction and processing of raw materials, along the supply chain, in transportation and distribution and, finally, in the usage and disposal of the products can, however, constitute as much as 90 per cent of the actual carbon footprint, depending on the business model and the position in the value-creation chain.
A second shortcoming in many corporate and portfolio analyses is that their perspectives are reduced to the status quo and that they interpret only isolated performance indicators. The current direct carbon footprint and revenue data alone are insufficient for drawing meaningful conclusions about a company's risk exposure and its future viability. Rather, it is critical to understand the company's context and performance development, and to integrate these into the investment strategy. In doing so, one question which can be asked is: is a company developing positively from a particularly negative starting point, or is it stagnating at a certain level? Other key factors might be: whether low or falling emission levels are misleading because they are primarily attributable to divestments of critical company units; or if targets or calculated savings are based on a "business as usual" scenario and do not lead to actual emission reductions. For the rating, it is therefore vital to factor into the equation the course of the corporate strategy and the emissions history. In addition, quantitative, historical indicators must be combined with qualitative indicators (e.g. corporate policies, objectives, measures etc.) to prepare meaningfully predictive analyses for the future.

oekom research's approach to rating climate performance

oekom research takes a holistic approach in its ratings, while simultaneously regarding the aforementioned pitfalls of capturing and minimising corporate climate risks.
The oekom Corporate Rating assesses a company's performance in tackling its industry- and company-relevant carbon risks and impacts along the entire value-creation chain. This assessment is based on an analysis of well over 100 cross-industry and industry-specific, qualitative and quantitative indicators. The Carbon Risk Rating is based on these data and, depending on the companies' respective industry and activities, assigns additional information on their climate risk exposure, thereby providing a precise and reliable rating of their overall climate-related performances. The Carbon Risk Rating, which returns a value on a scale from 0 (very bad) to 100 (very good), expresses how successfully a company tackles industry-specific climate risks, both in its production activities, as well as along its supply chain and in its product portfolio.

Overview of the current climate performance

The GLCU surveyed in this analysis reveals an average Carbon Risk Rating of 28.06. The overall distribution of this value is shown in Fig. 16.
It should be noted, however, that there are considerable differences in climate performance depending on the industry concerned. This is illustrated by a few examples in Fig. 17.
At an industry level, great differentiations between companies in e.g. in the Utilities sector (comprising electricity generation, gas supply, operation of power grids, water and waste services) are evident, with Carbon Risk Ratings ranging from 1 to 83. The industry's overall average is relatively high at 36.5 and can be broken down as shown in Fig. 18.
There are manifold reasons for such a wide spread in the Utilities sector: on the one hand, this sector is more immediately and directly exposed to climate risks than many others. On the other hand, companies in this industry are their own masters when it comes to minimising this risk exposure, especially in the choice of energy sources used for electricity and heat generation. Also, various regulatory constraints on the industry require many companies to achieve a certain "minimum performance"; this explains the

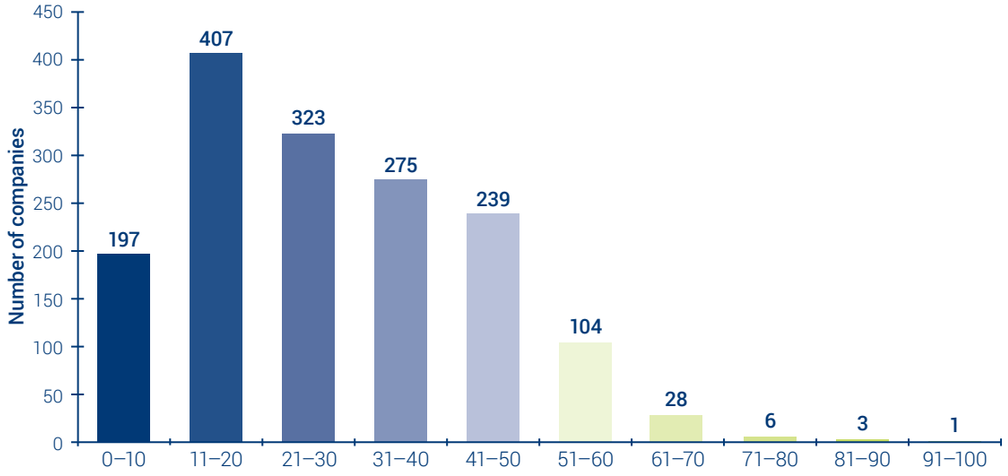

Fig. 16: Distribution of the oekom Carbon Risk Rating (n = 1.583)

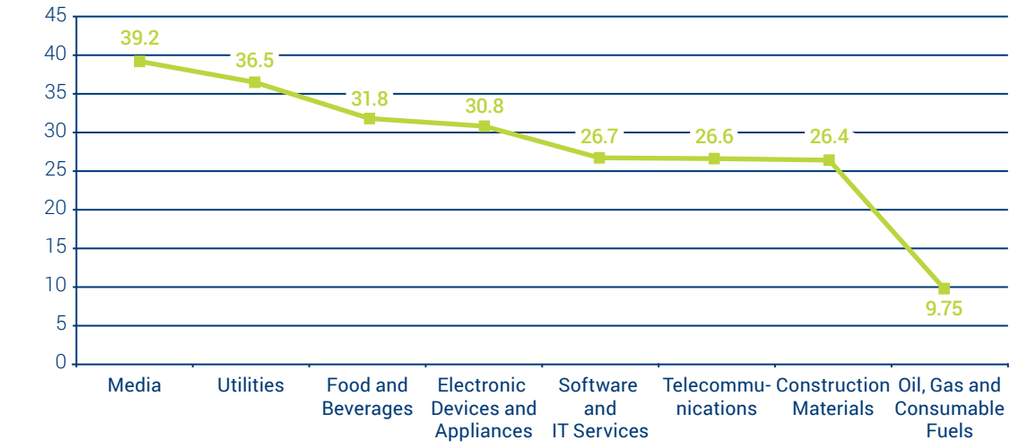

Fig. 17: Industry comparison of the oekom Carbon Risk Rating scores (average, scale 1–100)

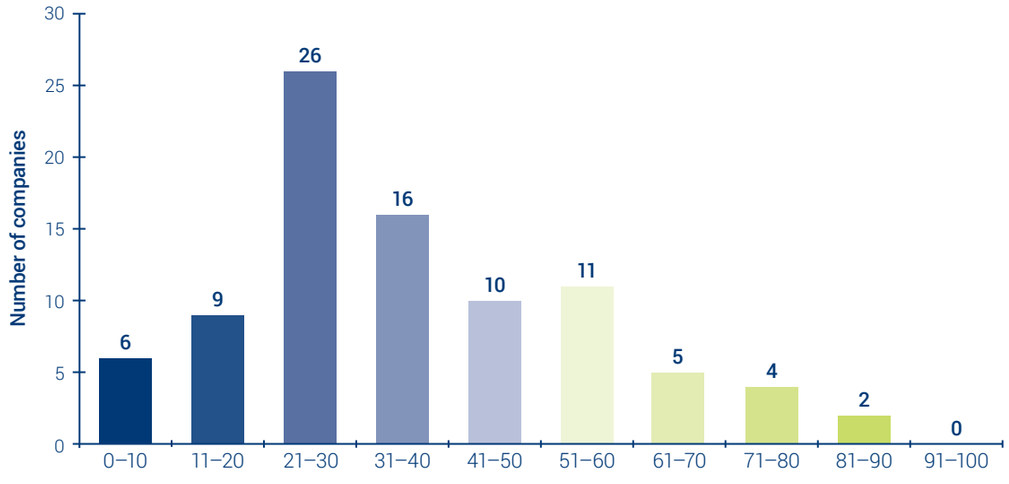

Fig. 18: oekom Carbon Risk Rating scores in the Utilities sector (n = 89)

relatively high share of companies with a rating of 20 or higher. And finally, some companies' very pronounced focus on renewable energies also boosts the average value to a certain degree.

Positive examples include Meridian Energy (score: 79) and Iberdrola (score: 72). Meridian Energy is a New Zealand-based power producer that concentrates exclusively on renewable energy sources (hydropower and wind). Another characteristic of this company is its future-orientated strategy, manifesting itself, e.g. in its plans to further reduce its GHG emissions, despite its already low-carbon business model. Spanish energy supplier Iberdrola also offers comparably low-carbon power generation due to a relatively high share of renewable energies and nuclear power. This company, too, has the self-set goal of further reducing its emissions. In addition to this, Iberdrola continues to significantly invest in renewable energy sources, and is also involved in research into technologies such as the use of marine energy. The companies at the bottom end of the spectrum are frequently exposed to considerable climate risks—to which they to some extent contribute themselves—such as adhering to coal as their main energy source, inadequate investments in renewable energies, a lack of GHG reduction goals, inefficient plant operations and unsound infrastructure (e.g. risk of leakages).

The Carbon Risk Rating also exposes significant differentiations at an international level. While companies in France (42.5) and Germany (39.2) score relatively high on average, companies in the USA, Australia and Canada score less than 25. This is due to various factors such as underlying country-specific conditions including the local energy and industry mix, or environmental legislation.

Summary and outlook

The underlying conditions for the battle against climate change vary—in part, considerably—from industry to industry and country to country. For companies and investors, however, it is essential to consider climate risks along the entire value chain—from the sourcing, processing and use of raw materials, to the use and end-of-life phase of products. Given the Carbon Risk Rating for the partly described utilities sector, but also regarding all other industries, it can be concluded that significant efforts are still needed to achieve global climate goals. Nontheless, the first winners and losers are already beginning to emerge in the current transformation processes. Particularly the utilities sector, for example, can make a significant contribution to climate protection by switching to renewable energy sources, operating highly-efficient plants, and avoiding CO_2, natural gas and methane emissions.

Principally, the following applies: a solely retrospective view of the direct carbon footprint is insufficient for companies and investors. Meaningful risk and performance assessments, serving as the basis of comprehensive corporate and investment strategies require, rigorous risk analyses covering the entire value-creation chain, and future-orientated goals and strategies that further the necessary transition to a low-carbon global economy. At the same time, investor alignment with climate protection and the associated developments will become essential if they are to avoid substantial falls in their portfolio values, in the short, as well as in the medium and long term.

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3.3. Green economy: conflicting goals on the path to a sustainable economy

Fundamental principles of a green economy

The central concept of a green economy is to reshape economic processes in such a way that they are in harmony with underlying environmental conditions and social needs. To this extent, a green economy can also be viewed as one of the catalysts of a general transformation process. According to a UN Environment Programme (UNEP) report published in 2011 that brought this term to the centre of attention, the green economy is the private sector's contribution towards achieving sustainable development[41]. A key element of a green economy is the development of new, environmentally friendly products and solutions (such as renewable energies) which enable economic activities to be better harmonised with the environment. Other solutions address further improving the energy- and resource-efficiency of production processes.

UNEP advocates that all endeavours towards achieving a green economy must attach topmost priority to combating global poverty for it to truly make the decisive contribution towards sustainable development. One of the key aspects which UNEP expressly emphasises is that environmental protection and economic growth are not necessarily mutually exclusive, and that, accordingly, environmental transformation of the economy is not a "luxury" only affordable for rich countries.

This perspective has, however, been somewhat neglected in many areas in which there is a pure focus on achieving technical solutions to urgent environmental problems. In some cases, this has resulted in conflicts of goals between so-called "CleanTech" solutions and other dimensions of sustainable development.

As sustainability goals cannot always be pursued without negative collateral effects on other parties, such goals may oppose the objective of comprehensive sustainable development; consequently, the oekom Corporate Rating takes a differentiated stance when evaluating even apparently positive technologies and projects. Several examples are introduced below.

What is Cleantech?

While the concept of a green economy can be interpreted as a guiding principle as to how to transform the economy in harmony with fundamental environmental conditions and social needs, so-called CleanTech solutions are concrete instruments for realising a green economy. In 2014, the German Federal Ministry of the Environment estimated the global market volumes of six leading markets in the growing CleanTech sector[42] as follows:

- Energy efficiency: EUR 825 billion
- Sustainable water-resource management: EUR 505 billion
- Environmentally-friendly generation, storage and distribution of energies: EUR 422 billion
- Raw-material and material efficiency: EUR 367 billion
- Sustainable mobility: EUR 315 billion
- Recycling: EUR 102 billion

Hydropower and wind energy: even renewable energies harbour sustainability risks

The conflicting goals of renewable energies' positive impact on the climate and their impact on other sustainability dimensions can be illustrated by the example of hydropower and wind-energy projects.

With a net contribution of 891 TWh, the illustration clearly highlights the central role played by hydropower among the renewable energies. According to Bundesverband Deutscher Wasserkraftwerke (Federal Association of German Hydroelectric Power Plants), around 15,000 TWh of hydropower reserves remain untapped worldwide, especially in Asia, Africa and South America—i.e. over fifteen times this amount.[43] These resources would suffice to cover the world's entire demand for electricity, illustrating the massive potential for intensifying the use of this energy source. The use of hydropower for electricity generation is generally recognised as an important contributor to reducing carbon emissions.

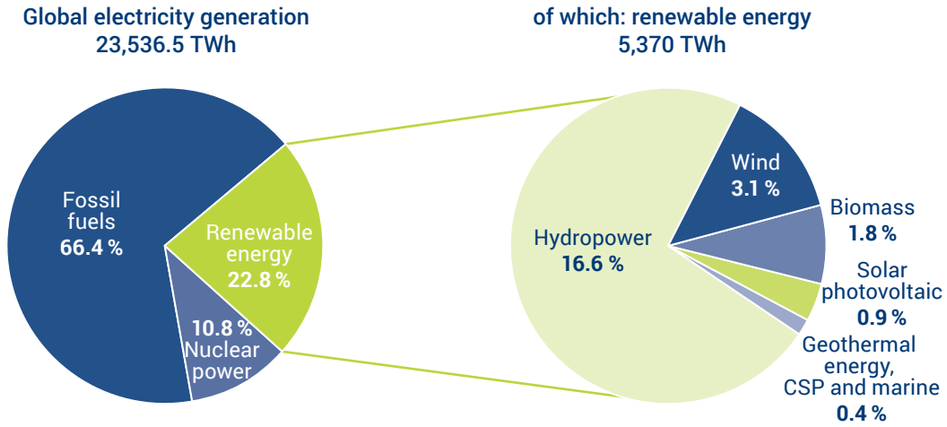

Fig. 19: Share of renewable energies in the global production of electricity in 2014. Source: www.et-energie-online.de and World Energy Council, REN 21, IHA, BP Statistical Review of World Energy June 2015

Moreover, hydropower is already being used to generate virtually all, or a large share, of electricity in some of the world's poorest countries such as the Congo, Ethiopia, Zambia, and Sudan, emphasising the importance of this form of energy for a country's development.[44]

The conflicting goals associated with further developing these green technologies are both of an environmental and a social nature. The negative consequences for the environment to be caused, in particular, by large dams, include changes to entire water-catchment areas (often with unpredictable consequences), the loss of biodiversity, and declining fish populations. These consequences are further exacerbated by cumulative effects when a river is economically exploited by several dams along its course[45].

In addition, studies in recent years have shown that, if the reservoir area of a dam is not properly cleared and freed of organic material prior to flooding, as prescribed by best practices, the decomposition of this matter can release substantial amounts of the climate-hazardous gas methane, later on. The net impact of hydropower on the climate can thus be far more negative than originally assumed.

At a social level, hydroelectric dams create a potential for conflict between neighbouring states if, due to such projects, another country's water supplies can no longer be sufficiently guaranteed[46]. Furthermore, the realisation of hydroelectric projects—especially in developing and emerging economies—frequently involves the controversial resettlement of residents without appropriate compensation or consultation. There have also been reports of intimidation of, violence against, and even the murder of opponents of such projects—for example in Honduras, where in 2016, human-rights and environmental activist Berta Cacéres and a number of her supporters were murdered in connection with protests against a hydropower project. Such controversies play an important role in the oekom rating, and can lead to downgradings in the areas of human rights and environmental practices.

Special industry-specific parameters are used to measure a company's success in managing the social and environmental risks associated with hydropower projects. oekom research expects, for example, that energy companies implement human rights due diligence procedures and suitable measures to ensure environmentally friendly design and operation of their hydroelectric power plants. For financiers, the application of specific ESG guidelines for hydropower financing is expected on top of general environmental and social lending appraisals. ESG topics to be included in environmental and social risk and impact assessments and related mitigation measures include among others the protection of ecosystems and the respect of the rights and livelihoods of local populations.

Compared with the potential negative consequences of hydropower dams described above, the social and environmental risks posed by wind farms are relatively low. Nevertheless, large-scale wind farms inherently involve large-scale land usage. Especially in high-risk regions, this can lead to land conflicts, particularly when the projects are realised on indigenous territory or in so-called "disputed territories" without consultation, or against the will of the local population, and when the local population has no direct ben-

efit from the wind farms (e.g. in the form of a better power infrastructure, employment etc.). The most recent examples of such conflicts to become known are the Western Sahara[47], a region occupied by Morocco 1975 in contravention of international law; and Kenya, where a wind farm has been erected on indigenous rangelands without proper consultation or compensation of the local population.[48] Both cases have resulted in a moderate downgrading of the involved companies in the oekom Corporate Rating in the area of human rights (Siemens, in the case of the Western Sahara, and Vestas Wind Systems in Kenya).

Profit from loss-making: the two faces of palm oil

Another problematic topic in the area of renewable energies is biofuels, with palm oil serving as a prime example. Here, conflicting goals arise primarily from opposing environmental objectives, such as decarbonisation, on the one hand, and reducing land usage and protecting biodiversity, on the other. Palm oil is produced from the oil palm and used mainly in food production and the manufacturing of cosmetic products. In recent years, however, the use of palm oil has increased enormously for the production of biodiesel. In the EU, for example, the quantity of palm oil used as an additive to biofuels increased seven-fold between 2010 and 2014, from 456,000 to 3.2 million tonnes.[49]

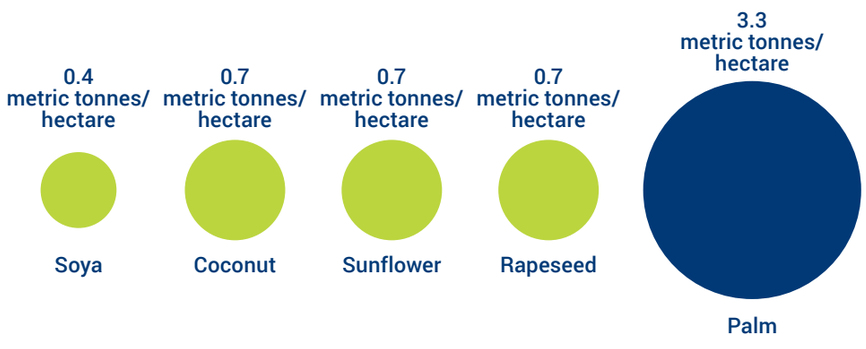

Fig. 20: Comparison of global oil yields of selected plants (WWF, 2016: 6)

From a climate-protection perspective, doubts regarding the use of this additive have grown strongly in recent years, mainly out of concern for the clearance of new plantation areas in Asia. The oil palm originates from the rainforests of western Africa, and since the start of the 20th century has been cultivated on plantations in South America and Asia. Because the per-hectare yield of the oil palm is so much higher than that of other essential crop plants[50] (see Fig. 20), agricultural land usage would be disproportionately higher, were plants other than the oil palm to be cultivated. The central problem is that the oil palm thrives best in those regions which essentially are natural growing areas of tropical rainforests.

Particularly in Indonesia, local rainforests have been subject to slash-and-burn clearance and peat-swamp forests drained to make space for oil palms in recent years. According to the Global Fire Emissions Database, the amount of CO_2 emitted each day by fires in Indonesia in the last quarter of 2015 alone was equivalent to that of the entire US over the same period. Over half of these fires were peat fires.[51]

While the EU Renewable Energy Directive requires palm oil cultivated as a biofuel additive to be certified (see Side Note), the increased use of palm oil as a biofuel has resulted in an increase in absolute demand, thereby indirectly promoting further land clearance. Accordingly, it is doubtful whether the target of reducing carbon emissions—which is, after all, the general goal of the Renewable Energy Directive—can be achieved at all, or if rather the exact opposite is the case.

Besides the negative consequences of the current palm oil production processes for the climate, the clearance of rainforests to make way for palm oil plantations is also resulting in a massive obliteration of biodiversity and the displacement of indigenous peoples. Moreover, Amnesty International also reported on the use of child and forced labour on palm oil plantations[52] in an article published last November. This is just the most recent of many examples highlighting repeated violation of basic human rights in the production of palm oil.

Side note: Certification of palm oil

Only a very small percentage of the palm oil production is certified according to conventional standards of organic agriculture or the Fair Trade label. The most common form of palm oil certification is issued by the "Roundtable on Sustainable Palm Oil" (RSPO). This roundtable was founded as a multi-stakeholder initiative in 2003 under the patronage of the WWF, the requirements including both environmental as well as social criteria. Companies active along the entire palm oil value chain can become RSPO members, applying for certification of their products and production processes for compliance with these criteria. oekom research's rating practice has, however, established that many member companies have been embroiled in controversies, both of an environmental and a social nature. oekom research nevertheless rates companies positively in the industries concerned (Food & Beverages, Household & Consumer Goods, Retail, and Oil, Gas & Consumable Fuels) if they can present policies corroborating the sourcing of certified palm oil only. Besides rating a company's corporate policy, the oekom Corporate Rating also assesses the share of certified palm oil that a company uses, as well as the rigour of the certification standard applied.

Photovoltaic modules and insulation materials: only good when they are in use

The above examples show to some degree the complexity of assessing green technologies. This complexity can also be seen in the life-cycle assessment of other important motors of a green economy, such as photovoltaic modules and insulation materials.

Both technologies play their respective part in a climate-friendly energy revolution: photovoltaic modules produce "clean energy", while insulation materials reduce heating-energy requirements in buildings. Life-cycle analyses have shown that both these technologies have a net positive energy footprint[53]. Over their lifespan, photovoltaic modules produce approximately ten to twenty times as much energy as that required for their manufacture. Numerous studies also show that, in the course of their useful life, insulation materials—regardless of type—save many times the amount of energy needed to manufacture them. Nevertheless, given the constant rise in installed photovoltaic capacity and volume of insulation materials used in buildings, the question remains as to how to deal with the materials—many of which are harmful to human health and the environment—at the end of their useful life. While essentially comprising non-critical materials such as glass and aluminium depending on their design, approximately 2–4% of the materials used in photovoltaic modules can be classified as hazardous waste, posing associated problems when recycling them.[54]

In the case of insulation materials, natural fibres and stone wool can generally be recycled when a building is demolished or dismantled, while expanded polystyrene-based composite insulation systems are far more difficult to separate and recycle. The treatment of many of these plastic-based insulation materials with flame retardants is a further aggravating factor. Consequently, in assessing the performance of companies in this sector, the oekom Corporate Rating not only considers the products' underlying, positive contribution towards achieving the global sustainability goals, but also the need to consider life-cycle analyses and recyclability of the materials in the product development stage.

Rockwool International and SunPower stand out as positive examples here: Rockwool International is a supplier specialising in insulation materials based on stone wool, which is comparatively innocuous from an environmental perspective. Moreover, the company has installed comprehensive measures to take back and recycle used materials. In the photovoltaic sector, SunPower, for example, has taken special measures to mitigate the environmental impact caused in connection with module disposal: the company offers options for collecting, recovering and recycling its products worldwide. Some of its product series also have "cradle-to-cradle" certification, ideally allowing the materials to be reprocessed in a closed technical cycle.

Summary:

The presented examples show that not even a green economy is an absolute guarantor for sustainable development, and that CleanTech solutions can also have a negative impact—both from an environmental and a social perspective. The ways in which these technologies are used and their net environmental and social impact must be precisely analysed. Nevertheless, the green economy plays an indispensable role as a catalyst and accelerator for sustainable development in general, and a support and motor for the transformation process.

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Alexander Weigand, Senior Analyst

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3.4. The Automobile industry: the upheaval of a business model

Future challenges of the Automobile industry

The Automobile industry is one of the industries generating the highest sales and is one of the largest employers in countries such as Germany, Japan, the USA and South Korea: over 90 million vehicles are manufactured each year, with over 12 million people in Europe alone working either directly or indirectly in this industry. The industry is also an innovation leader: in Europe it invests over EUR 40 billion a year in research and development, substantially more than any other industry[55]. In doing so, the core of the product—the internal combustion engine—has principally remained unaltered for decades. Due to the harmful emissions produced from combusting fossil fuels, environmentalists have been criticising the industry vociferously for a long time now. While it is true that all of the market's key manufacturers have been working on alternative, non-fossil-fuel-based drive systems for many years, the niche existence that these technologies continue to enjoy at most of them evinces the industry's decade-long lack of commitment to change.

Practically all of the large carmakers are facing a serious problem: the underlying conditions seem to be changing so massively in such a short period of time that the old product strategies no longer work. The transition from the internal combustion engine to electromobility is a central factor here. The following article thus explores how carmakers are equipped to face the transformational challenge lying ahead

Renunciation of fossil fuels: priority for environmental protection, health and safety

The discussion on climate change, which was intensified by the Paris Climate Agreement, has revealed broad consensus on the need to decarbonise the economy. In doing so, criticism has centred on fossil fuels. At the same time, ever-more cities worldwide are facing a serious smog problem caused by factors such as traffic emissions. The nitrogen oxides and fine dust released by combustion cause damage to respiratory tracts: The European Environment Agency, an EU institution, estimates that around 500,000 people die prematurely in Europe each year due to exposure to fine dust and nitrogen oxides[56]. Also, with the statutory limits for fine dust being regularly exceeded in some European cities, the pressure to take comprehensive countermeasures is huge: more and more cities are therefore imposing driving restrictions in acute smog conditions, as recently seen in e.g. Paris, Madrid and Oslo[57]; and some cities, such as London, Paris, Athens, Madrid and Mexico City, are talking about permanent bans on diesel vehicles altogether. The combustion engine is also coming under increasing scrutiny at a national level: some countries, such as Norway, Austria and the Netherlands, have been openly contemplating a general ban on the first-time registration of cars with combustion engines[58]. The latest scandals involving manipulated emissions measurements at VW and other carmakers have stoked the discussion further.

Side note: demands on mobility

The challenges of the Automobile industry lie not only in developing alternatives to the combustion engine: the fundamental demands which society places on mobility are also changing. The popularity of car-sharing models, for example, is growing rapidly, primarily in the cities of Western industrialised nations, thereby eliminating ever-more individuals' need for a motor car of their own. Contrastingly, first-time registrations of high-powered off-road vehicles continue to enjoy substantial growth rates. Moreover, serious problems would arise for the global environment, were cars with combustion engines to become as popular in emerging economies as they have in the industrialised world—a scenario which many carmakers still see as promising for new sales markets. A further turning point for the Automobile industry is the challenge of digitalisation: increasingly, companies from outside the industry—such as Google, Apple and Uber—are paving the way with pioneer work on their own mobility concepts, and influencing product development where aspects such as data privacy are also playing an increasing role. And finally, research into autonomous driving and deliberations on potential liability for accidents are raising ethical questions to which the industry must find entirely new answers.

Alternatives to the combustion engine

Although the search for alternative drives is nothing new, the global decarbonisation discussion and the industry's emissions scandal have conferred on it a new degree of urgency. However, even the continually declining thresholds for the average volumes of CO_2 which a producers' sold fleets may emit, will be scarcely achievable based on conventional combustion-engine technology. Carmakers are thus facing decisive strategy decisions.

At least at a political level, electromobility appears to be the preferred form of drive system of the future. Several countries, including the USA, the UK, Norway, Sweden, France, the Netherlands, Japan and Germany have recently introduced state subsidies for electric cars[59]. China has also announced its intention to introduce an electric car quota for all foreign carmakers as early as 2018—a step that is likely to pose an immense challenge to most manufacturers.

The advantage of electrically powered vehicles is the absence of locally produced, combustion-related emissions, consequently providing the opportunity to slash inner-city pollution. Moreover, at around 95 per cent, the efficiency (i.e. the share of input energy which actually contributes to the vehicle's motion) is much higher than that of the combustion engine. Additionally, the vehicles' batteries could also play an important function in the energy revolution, serving as energy storage for regenerative energy.

Current obstacles include the still-inadequate charging-point infrastructure, as well as the lengthy recharging times and limited range of the vehicles, the latter primarily caused by the continuingly high cost of battery storage and high battery weight. So-called plugin hybrids combining electrical and internal combustion engines have an electric range of just 50 km. For pure electric cars, the range currently rises to between 145 km (smart electric drive) and around 400–600 km for the Tesla Model S and Opel Ampera. The Volkswagen E-Golf which has headed the registration statistics in e.g. Norway over the past years, has a

Table 2: Key issues which oekom research requires of the Automobile industry

Fleet consumption

- Average emissions of CO_2
- Strategy to cut fleet consumption and training to promote energy-efficient driving

Vehicle life-cycle analyses

- Holistic calculation of the environmental impact of various models and drive systems "from well-to-wheel"
- Detailed life-cycle analyses which not only encompass CO_2 footprint and fuel consumption, but also other aspects such as noise emissions, recycling quota and consumed raw materials, which are based on international standards (e.g. ISO 14040)

Supply-chain sustainability requirements

70 to 80 per cent of value creation in automobile production is to be found at the suppliers. Therefore:

- comprehensive supplier standards which contain both labour rights and environmental guidelines
- systematic verification and monitoring of compliance with these standards

Alternative drive systems and mobility concepts

- Research, development and production in various areas of alternative drive
- Distinction between small series/studies and series production (best score)
- Guidelines on sustainable mobility concepts which also include means of transport other than cars; marketing of package solutions which include other forms of mobility

	Industry average	Bayerische Motoren Werke AG	Daimler AG	Fiat Chrysler Automobiles NV	Ford Motor Co	General Motors Co	Honda Motor Co Ltd	Isuzu Motors Ltd	Nissan Motor Co Ltd	Peugeot SA	Renault SA	Toyota Motor Corp	Volkswagen AG
		DE	DE	NL	US	US	JP	JP	JP	FR	FR	JP	DE
Vehicle fleet fuel consumption	D	D–	D	D+	C	D	D	D–	C	C	C	C	D–
Vehicle life cycle analyses	D+	C+	B–	C+	C+	D	C	D	C+	B	B–	C+	C
Sustainability standards in the supply chain	D+	B+	B	B–	C+	D–	D	D	C–	B	B	D	B–
Alternative drive systems and mobility concepts	C–	B+	B–	B	C+	C–	B+	C–	B–	B–	B	B+	B

Fig. 21: Performance of selected companies in the industry's key issues

range of around 190 km; the Nissan Leaf, one of the best-selling electric cars worldwide, performs marginally better, at 200–250 km[60]. With massive drops in the price of battery storage over the past years, competitive prices for electric cars seem likely in the future. Also, over the mid-term, the range problem could be best overcome in dense urban areas where—despite remaining planning difficulties due to building restrictions[61]—the appropriate infrastructure could be most-readily installed.

A crucial aspect in the e-mobility discussion is that an electric car's net impact on climate depends greatly on the local electricity mix: an e-car in e.g. eastern Europe or China, where a large share of the electricity is generated by coal-fired power stations, can even have a worse net impact on the climate than a car with conventional internal combustion. In a country such as Norway, by contrast, where almost 100 per cent of electricity is generated from hydropower, the balance shifts significantly towards the e-car[62].

In view of the e-mobility debate, other alternative drive systems appear to have currently faded into the background. At the end of January 2017, for example, the German Federal Government announced its intention to discontinue existing tax breaks for liquefied petroleum gas (LPG) cars, a step which will likely stall further development and proliferation of this technology, at least in Germany. By contrast, natural gas as well as hydrogen and fuel cells, remain important alternatives to conventional combustion engines, say experts. In doing so, converting combustion technology to natural gas is relatively straightforward; fuel-cell technology, by contrast, remains technically problematic, especially in terms of the hydrogen storage and, again, the lack of infrastructure. Accordingly, use of fuel-cell technology is only likely to become viable in the distant future.

Ready to race, or stalled: corporate strategies for change

Following the revelations of Volkswagen's manipulated exhaust emissions in September 2015, similar irregularities have been found in the measurements of nitrogen oxide emissions for models of almost all mainstream carmakers[63]. Elevated values for CO_2 emissions were also observed during these inspections. Although Volkswagen is the only company to have been exposed explicitly for using illegal software to specifically manipulate test results to date, the revelations have brought the credibility of the entire industry into disrepute.

These recent developments come as no surprise to oekom research. While the industry has long been in the public eye for its sustainability performance, and has thus aspired to score well in many parts of the rating, its overall performance—particularly with respect to the key issues listed in Table 2—presents a rather mixed picture.

Fig. 21 shows that the large, prominent manufacturers score fairly well in the key issues compared with the average of all rated companies. Nevertheless, not a single manufacturer achieves an 'A' grade in any one of these central action areas.

Given that oekom research will be further tightening its rating criteria for emissions and drive systems due to changes in the underlying conditions, a broad decline in the ratings can probably be expected.

Conspicuous are the relatively poor results achieved, especially in the area of fleet consumption. Traditionally, French manufacturers Renault and Peugeot are best positioned here, notably because their product portfolios are dominated by small cars with low consumptions. The same is true of Nissan. But here, too, it generally applies that the on-road consumption of these manufacturers' fleets is much higher than the specified values which are based on unrealistic test conditions.

Almost all the mainstream manufacturers are conducting research into, and have presented small series and studies in the area of, "alternative drive systems". But a very different picture is painted when it comes to the series production of such vehicles: the companies' product portfolios will need to expand rapidly if they are to meet the imminently tightening regulatory guidelines in the future (e.g. the new standard which limits fleet emissions for all newly licensed passenger cars to an average of 95g CO_2 per kilometre, to take effect in the EU from 2020). oekom research's ratings appraise prototypes and general research activities in this area per se positively, which has led to the reasonably good scores in the illustrations. In future, however, these scores will only be awarded for the series production of models with alternative types of propulsion and appropriate revenue shares.

Peugeot and Renault are currently frontrunners in the area of life-cycle analyses (LCAs). Renault, for example, uses detailed LCAs in compliance with international standards for the majority of its models and also makes these analyses accessible to the pub-

lic. In this way, both customers and other stakeholders can access the information they need to obtain a comprehensive picture of a specific model's environmental footprint.
On this basis, a mixed overall picture arises of the Automobile industry's ability to successfully master its future challenges: the know-how and fundamental capability to migrate from internal combustion engine technology to electrically powered cars exist, but the step from niche market to mainstream has yet to be taken.

Conclusion and outlook

A swift end to the combustion engine can be ruled out, despite the industry's current momentum. Even now, however, the industry must start tackling key questions about its future to address increasingly stringent legislation and the long development cycles needed for its products and technologies. The further development and establishment of alternative scenarios to the internal combustion engine and radically new mobility concepts are central aspects upon which the car's role and function as a means of mobility and transport, and the very future of the industry, depend. Companies failing to make significant progress in this area will see their competitiveness seriously eroded in several years—a prediction corroborated by experts who suggest that, in just 15 years' time, one third of all newly registered vehicles in Europe could be pure e-cars[64].
To reflect these developments, oekom research will also be tightening its requirements for fleet consumption and alternative propulsion systems over the coming years. In doing so, it will only grant Prime Status to manufacturers with a significant share of vehicles with alternative drives or especially low emissions. oekom research will also be raising the standards with respect to digitalisation. Against the background of digital networking (e.g. with other road users and traffic-guidance systems) and autonomous driving, car manufacturers will have to demonstrate more than ever before their ability to reliably control the vehicular IT infrastructure and protect it against illegal manipulation from outside. Responsible handling of the generated data will also come under increased scrutiny in the assessment.

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3.5. The Oil & Gas industry: a sluggish tanker in stormy seas

Political and social consensus for decarbonisation

An ever-increasing share of greenhouse gas emissions is covered by regulatory guidelines and measures for mitigating climate change—not least due to the Paris Climate Agreement and its successor conferences. These include emissions trading systems, carbon taxes, tightened energy- and fuel-efficiency standards and the wide-spread development of renewable energies. In addition, more and more countries have been trying to reduce or completely eliminate fossil-fuel subsidies for a number of years now, with such approaches meanwhile also observable in a range of developing and emerging economies such as China, India or Indonesia[65]. While the coal industry in particular was initially affected by divestment, the focus of attention has meanwhile also turned increasingly to oil and gas companies. In January 2017, Ireland, for example, endorsed draft legislation to dispose of all coal, oil and gas investments of the EUR 8 billion-strong Ireland Strategic Investment Fund[66].
Oil and gas companies are thus under growing pressure to render the stability and viability of their oil and gas reserves—also known as "portfolio resilience"—transparent for investors. Shareholders are increasingly insisting the long-term consequences of climate change and associated regulatory constraints on business operations be taken better into account. In 2015, for example, shareholders of Norwegian oil and gas company Statoil instructed the company to disclose information on the viability of its portfolio in view of manifold climate risks. Similar initiatives have already been taken at other companies, such as Royal Dutch Shell and BP. In doing so, the central questions are: how robust are the reserves in view of the wide range of future scenarios? And how great is the danger of so-called stranded assets? Barclays, for example, has estimated that the coal, oil and gas industries may have to reckon with sales losses of up to USD 33 trillion over the next 25 years[67].

Technological transformation

For some years now, renewable fuels in particular have been developing into one of the main adversaries of fossil fuels. Many developing and emerging countries are also investing—in some cases massively—in proliferating power generation from hydro, solar and wind power, biomass and geothermal sources, and setting themselves corresponding goals for their national energy mixes. The International Energy Agency (IEA) estimates, for example, that the power generated worldwide from renewable fuels will rise cumulatively by around 825 gigawatts (GW) from 2016 to 2021, and that by 2021 it will account for around 28 per cent of global electricity generation. This would be an increase of around 42 per cent on today's available capacity[68]. In 2015 alone, a new record value of 153 GW was reached, accounting for 61 per cent of the new electricity generation capacity installed worldwide that year. A key development in this respect is the sharp fall in the cost of wind and solar power installations over the past years, making them much more competitive compared to their conventional counterparts such as coal, oil and gas. While the cost of wind turbines has fallen around 30 per cent since 2009, the prices of some solar modules have even fallen by as much as 80 per cent[69] over the same period.
But renewable fuels are not only making it harder for the oil and gas industry in power generation; they are also preparing to play an important role in the future of transportation. In particular, the Volkswagen scandal involving manipulated exhaust values has given electromobility a tangible boost and put carmakers on the spot, as the crude oil used for road transport continues to account for a large percentage of the extraction volume worldwide[70]. In the area of battery storage, significant progress has also been made in terms of storage capacity and production costs, which will further fuel competition between electric and internal combustion vehicles[71].

Table 3: Key issues which oekom research requires of the Oil & Gas industry

Climate protection
• Comprehensive climate change strategy, including ambitious reduction targets and a detailed discussion on climate risks, particularly with respect to physical, regulatory and market-specific challenges, as well as on 'portfolio resilience'
• Appropriate reduction measures through e.g. improving process efficiency; reducing carbon dioxide and methane emissions from gas flaring and venting; using natural gas instead of diesel for power generation; and promoting alternative fuels and renewable energies
• Extraction mix with a high percentage of conventional natural gas
Environmental risks and impacts of operations
• Certified environment management systems
• Commitment to abstain from industrial activities in protected areas
• Ensuring facility safety (e.g. pipelines, tankers and refineries) and emergency preparedness
• Use of cutting-edge technologies to minimise harmful emissions
• Systematic avoidance of severe environmental controversies
Work safety and accident prevention
• Certified health and safety management systems
• Exercising due diligence in selecting and auditing contractors
• Systematic avoidance of work-related accidents resulting in serious injuries and/or fatalities

	Industry average	BP PLC	Chevron Corp	ConocoPhillips	Eni SpA	Exxon Mobil Corp	Gazprom P JSC	Oil & Natural Gas Corp	PetroChina Co Ltd	Petroleo Brasileiro SA	Petroleos Mexicanos	Rosneft P JSC	Royal Dutch Shell PLC	Statoil ASA	Suncor Energy Inc	TOTAL SA
		GB	US	US	IT	US	RU	IN	CN	BR	MX	RU	GB	NO	CA	FR
Climate protection	D+	D+	D+	D+	C+	D+	C	D+	D–	D+	C–	D+	C–	C+	D+	B–
Environmental risks and impacts of operations	D	D+	D	D+	C–	D	D	D–	D–	C–	D	D	D	D+	D+	C–
Worker safety and accident prevention	C–	D	C+	C–	B–	C+	D	B–	D	D	C–	D	C+	C–	D+	C+
Business ethics and relations with governments	C–	C–	D+	B–	C+	C+	D+	D+	D–	D	C+	C	C–	A–	B–	C+
Protection of human rights and community outreach	D+	B	C	B+	B–	C–	D	D+	D	C	D–	D	C	A–	C	B+
Key issues, total	D+	C–	D+	C–	C	C–	D+	D+	D–	C–	D+	D+	C–	C+	C–	C+

Fig. 22: Performance of selected companies in the industry's key issues

Immanent challenges for the industry

Besides the aforementioned challenges, oil- and gas-industry companies are faced with—in some cases considerable—price volatility, and the rising complexity of tapping new reserves. With state-owned companies generally owning the largest remaining conventional deposits, the shortage of easily accessible reserves is increasingly forcing independent companies to deploy technologies which are seriously harmful to the environment (e.g. fracking, oil sands mining), or to move operations to sites which are particularly vulnerable environmentally and/or very demanding technologically (e.g. deep-sea drilling, mining in the Arctic). Such projects are associated with much higher costs and risks, and the generally low price levels seen over the past few years have already caused many capital-intensive projects to fail. Examples of this are the Shell and BP projects in the Chukchi Sea off the coast of Alaska, and in the Great Australian Bight.

The fundamental risks for oil- and gas-industry companies are only partially dependent on their business models. Both integrated companies as well as pure upstream (extraction), midstream (transport, pipelines, processing) and downstream companies (refineries, distribution, filling stations) will be affected by upheavals alike. In this highly-integrated industry, companies further down the value chain will simply be unable to escape any shock waves from changes at companies further up. One thing is clear however: enterprises focusing on crude oil are at greater risk than those focusing on the less climate-harmful natural gas—which is frequently considered as a bridge in the energy transition.

Requirements for the Oil & Gas industry

oekom research currently has 146 oil and gas companies in its Universe. While the industry average is D+ (on a scale from A+ to D– (worst)), only four companies achieve Prime status, which starts at B–. These are Total, Neste, Snam and Enagas. In principal, companies have various ways in which to achieve Prime status. But there are a number of different industry-specific key issues in which companies must fulfil certain minimum requirements for any chance of achieving Prime status.

The key issues defined for the Oil & Gas industry are: climate protection, environmental risks and impacts of operations, work safety and accident prevention, ethical business practices and relations with governments, as well as protection of human rights and community outreach. As the industry's current transformation processes are primarily driven by climate change, part of the main focus of attention should be on climate protection and the associated risk areas (Table 3). In particular, a future focus on unconventional extraction methods and regions will harbour numerous environmental and work-safety risks. The same applies also for many of the industrial processes along the fossil value chains.

Looking at how the overall Oil & Gas industry scores in terms of the requirements needed for Prime status, it is clear that massive improvements are needed in the key issues, across the board. Fig. 22 contains some examples of the current performance of some of the industry's key players, at the same time showing the average values for the entire sector. In doing so, it is noticeable that, inter alia, European companies generally score better than their competitors from North America and Asia.

Especially against the background of the aforementioned climate risks, one of the industry's central weaknesses is its extremely slow progress in reducing emissions from gas flaring and venting. In addition, leaks in the infrastructure for extracting, processing and transporting natural gas release massive volumes of methane, a much more potent greenhouse gas than carbon dioxide, thereby partially eroding the climate benefit of natural gas at the combustion stage compared to other fossil sources.

Another important aspect affects investments in renewable energies. These remain at a persistently low level across the industry, with no significant, upward trend presently in sight. Only four of the fifteen companies in the benchmark group (Eni, Shell, Statoil and Total) currently have concrete investment plans. Moreover, the use of second-generation biofuels produced from non-food crops falls far short of its potential.

Corporate strategies for tackling the transformation processes

Overall, three ways of tackling the existing challenges emerge. These range from essentially 'business as usual', to moderate strategy adjustments, and highly proactive and ambitious changes to the core business.

Proponents of the first category, business as usual, include companies such as ExxonMobil and Chevron. These generally concentrate, at most, on improving the efficiency of their extraction processes, but have no aspirations to transform their core business, and argue that the observable regulatory and social changes have no substantial consequences for their business models.

The second category comprises companies which have recognised the risks of today's transformation processes and are responding to them with a strategy of moderate change. This manifests itself in e.g. improved transparency of their climate reporting, or a somewhat tentative development of their climate-protection endeavours. Their main focus nevertheless generally continues to be on improving the efficiency of their extraction processes, and less on a comprehensive diversification of their portfolios. Advanced companies in this category attempt to improve the ratio of natural gas to crude oil in their future extraction mixes, and boost business in the area of liquefied natural gas (LNG) trading and transport. Examples in this category are Eni, Royal Dutch Shell and Statoil. Some companies, such as Eni, are starting to invest more heavily in biorefineries and the processing of second-generation biofuels.

The last category includes companies proactively seeking an ambitious transformation of their core businesses. Notable examples of these are Total and Neste. Generally, however, business strategies centring on fundamental change remain the absolute exception, and the degree of aspired change can vary considerably. Particularly noteworthy are the efforts of Total which greatly surpass those of its peers (see infobox).

Case study "Total" as example of a proactive business strategy

- Development of a 20-year strategy (up to 2035) and orientation towards the IEA's 450 ppm scenario (based on the 2° Celsius goal)
- Goals up to 2035:
  - Increase the share of natural gas in the extraction mix from 47 per cent at present to 60 per cent
  - 20 per cent portfolio share of low-carbon business activities in the areas of renewable energies, energy storage and biomass energy
- Divestment of coal unit in 2015
- Acquisition of leading battery maker "Saft" in 2016
- Purchase of photovoltaic manufacturer "SunPower" in 2011

Conclusion and outlook

Just 2.7 per cent of the oil and gas companies rated by oekom research currently achieve Prime status. In view of the significant imminent upheavals which the industry will face, two central questions arise: Which future expectations will oil and gas companies have to satisfy from a sustainability perspective to tackle these upheavals? And to what extent will they be able to do so? An initial, fundamental condition will be a sharper focus on conventional natural gas (over 50 per cent of total hydrocarbon production) and the associated value chain (e.g. with respect to the LNG market) and, over the longer term, an increasing use of renewable energies. Improved production efficiency will also be indispensable, especially in terms of reducing carbon dioxide and methane emissions such as those arising from gas flaring and venting. Conservation of water resources is also becoming increasingly important, especially for activities in environmentally sensitive regions and against the background of future plans for large extraction projects in water stressed regions. Last but not least, oil and gas industry companies will be expected to set themselves GHG emissions reduction targets that are in line with climate science (these so-called "science-based targets" are explained in greater detail in Section 3.2) in the future.

To summarise, it can be said that the bulk of the industry seems to cling to antiquated assumptions and take the broad view that, due to global population growth and a growing middle class in many developing and emerging economies, demand for oil and gas will initially continue to rise unabated. Nevertheless, many recent developments point to a significant acceleration in the existing technological and social transformation processes, and a continued tightening of regulatory constraints. Consequently, the possibility of crude-oil demand collapsing faster than previously anticipated is becoming all-the-more probable. Were such a scenario to unfold, companies which have failed to switch timely from fossil fuels to renewable energies could fall by the wayside.

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3.6. Seeking equilibrium: the Food and Beverages industry under pressure to transform

Challenges of a key industry

With the production of animal and crop products requiring a high consumption of resources, barely any other industry could have as much interplay with the achievement of global sustainability goals as the Food & Beverages industry. Worldwide, agriculture is today practiced on an area of around 5 billion hectares[72] or on more than one third of the planet's surface.[73] Factors such as excessive use of pesticides and fertilisers, as well as monocultures, are impacting biodiversity and resulting in a continual decline in arable farmland[74]. Agriculture is also responsible for around 70 per cent of global water usage[75] and a third of all greenhouse gas (GHG) emissions[76]—with a rising tendency. But the social impact of agricultural value creation is also huge: according to estimates, almost 2.6 billion people worldwide live either directly or indirectly from farming, 2.5 billion of them in developing countries. In doing so, 70 per cent of global foodstuffs are produced by around 1.5 billion small-scale farmers[77] who not only supply local markets but also large companies, sometimes via multiple intermediaries. According to the World Bank, 800 million of them were still living beneath the global poverty line in 2014[78].

Simultaneously, at the other end of the value chain, one out of every four calories produced is never consumed due to food waste,[79] even though in times of continuing population growth, ever-more people need sufficient and—increasingly in the focus—healthy nutrition. Significant progress has nevertheless been made in combating malnutrition over the past years. The sharp contrast which has meanwhile emerged—between the 460 million undernourished people and approximately 1.9 billion overweight people worldwide—indicates a shift in the nutritional predicament[80].

These figures show that the Food & Beverages industry plays a key role in transforming global economic cycles to the benefit of a more sustainable world. Particularly through its supply chains, it is one of the central contributors to global megatrends such as climate change, resource scarcity, and loss of biodiversity which, in turn, influence the future viability of the industry's business models. More and more, these developments are inducing other stakeholders to increase the social pressure on the industry too. An upsurge in statutory efforts to regulate the industry (such as controls on the use of antibiotics in livestock farming, or so-called sugar taxes in countries such as France), or changing, more sustainability-aligned consumer demands (keyword: "organic") are key drivers of these trends, both of which are primarily to be observed in industrialised countries so far. Sustainability-orientated investors are also emerging as catalysts in this development: the decision of Norway's state pension fund to withdraw its investments from four Asian palm oil companies[81], for example, sent a clear signal to the sector.

To remain thriving and successful companies, food and beverage manufacturers must confront the new realities. Given the wide range of challenges, a "business as usual" strategy will not function in the long-term: on the supply side, without a sufficient amount of fertile soils, water, and supplies of raw materials, nothing can be produced; and on the demand side, changes in society can rapidly endanger the viability of entire production lines. Companies must therefore reduce the negative consequences of their businesses for humans and the environment as much as possible, while simultaneously grasping emerging opportunities for sustainable product innovations. These basic demands on sustainably-managed food companies are also reflected in the oekom Corporate Rating's Prime requirements for the industry.

Requirements for the Food and Beverages industry

oekom research currently assesses 179 food and beverage manufacturers in its universe. While the average rating for the industry is D+ (on a scale from A+ to D– (worst)), 14 companies achieve Prime status, which starts at C+ (as at January 2017). Due to the wide range of topics assessed in the oekom Corporate Rating, there are various ways in which a company can achieve Prime status. As in other industries too, companies must score particularly well in a number of defined key issues for a chance of achieving Prime status (cf. Table 4).

Besides collecting data for the rated companies, another central task in the rating process involves extensive screening of numerous external information sources regarding controversial business practices at the companies and their suppliers. Existing controversies in the stated areas—such as child labour in the supply chain, or the sale of contaminated products—would have a negative impact on a company's rating, thereby hindering or preventing its achievement of Prime status.

Table 4: Key issues which oekom research requires of the Food & Beverages industry

Labour rights along the entire value-creation chain
• Implementation of extensive and, ideally, certified management systems for compliance with central standards regarding work safety and freedom of association, both for the company's own operations and in its supply chain
• Evidence of system robustness through the reporting of pertinent KPIs, e.g. declining accident rates
Consumer health and safety
• Production of nutritious and healthy products
• Extensive, certified food-safety management systems
Impact on soil and biodiversity
• Active management and reduction of negative effects on soil and biodiversity along the entire value chain
Water protection and efficient water usage
• Implementation of robust systems and measures for actively managing water consumption (with respect to water quantity and quality), both for the company's own operations and in its supply chain
• Evidence of system efficacy through the reporting of pertinent KPIs, e.g. lower water use
Reduction of direct and indirect effects on the climate
• Definition of concrete goals for reducing greenhouse gases
• Implementation of complementary measures and transparent reporting of climate impact, both for the company's own operations and in its supply chain
• Evidence of system efficacy through the reporting of pertinent KPIs, e.g. declining emission levels

Corporate strategies for tackling the transformation processes

The 179 foodstuffs companies in the oekom Universe tackle the many sustainability requirements to extremly varying degrees. As described above, the industry's main ramifications radiate from the supply chain. But for the majority of the companies, their penetration in particular is still very much at the beginning. While efforts to achieve greater transparency are discernible, the number of farmers in the supply chains generally varies from between several thousand to over one million, depending on the company's size, making the task a very challenging one for the companies.

Especially soil- and biodiversity-related problems have tended to be neglected in the public debate thus far. This is also reflected in the way companies are tackling these issues, with just 19 per cent able to evince at least adequate management of soil- and species-conservation issues along their entire agricultural supply chains (cf. Fig. 23). Also with respect to managing GHG-emission and water aspects, the focus of most of the companies remains decisively on their own factories only, even though by far the largest part of their footprints arises in the agricultural supply chain. But a number of positive examples are also evident, such as Kellogg, whose GHG-reduction goals also cover the supply chain, aiming to reduce emissions there by 50 per cent by 2050.

Recurrently, labour rights controversies often erupt in the complex, upstream value chains often located in emerging and developing countries. Even companies with intrinsically good management approaches in this area, such as Nestlé, can be affected here. Around eight per cent of the foodstuffs companies in the oekom Universe are presently embroiled in labour rights controversies in the supply chain, resulting in a downgrading in the rating.

At the other end of the value chain, the intensive use of natural resources in the manufacturing process should ideally result in a product portfolio which itself contributes to sustainable development, rather than, indeed, even intensifying problems such as malnutrition and overeating. An analysis of the product portfolios of the companies in the oekom Universe shows, however, that the vast majority predominantly offers products which, from a nutritional perspective, can only be deemed problematic – such as alcoholic beverages, soft drinks, sweets or highly processed foods containing large amounts of sugar, fat or salt (cf. Fig. 24).

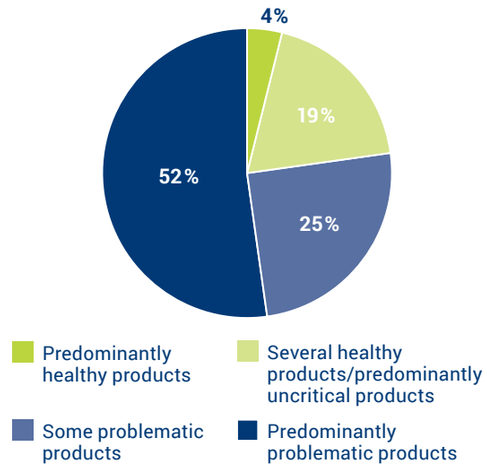

Fig. 24: Analysis of the product portfolios from a nutritional perspective

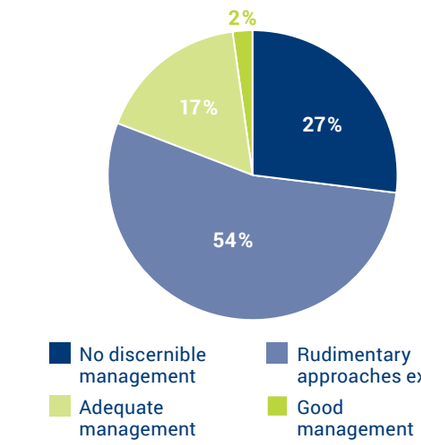

Fig. 23: Soil and biodiversity management in agricultural production along the value chain

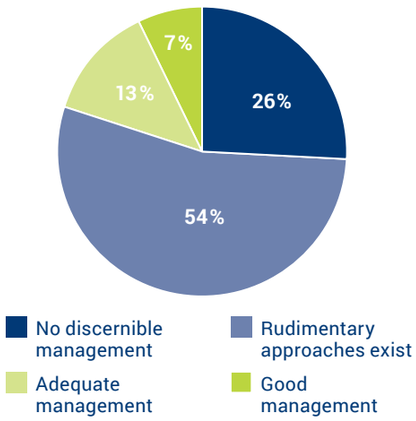

Fig. 25: Management of nutritional aspects

With respect to transformation strategies, the majority of the companies have at least a rudimentary understanding of the health and nutritional aspects of their portfolios. However, only just under 20 per cent have actually taken more comprehensive measures to improve their product portfolios – such as by reformulating recipes to reduce the sugar or salt content of their products (cf. Fig. 25).

Conclusion and outlook

Based on the current rating results, it can be remarked—intentionally overstated—that, for the manufacturing of products, which in the majority of cases are problematic from a nutritional perspective, the foodstuffs industry currently also tolerates massive negative environmental and social impacts in its supply chains. This business model is not sustainable and cannot prevail over the long term given the shifts in the global underlying conditions. If these companies fail to transform their business practices in the near future, they could end up facing shortages in central input resources and losing key sales markets for their products.

Many companies already sense the rising pressure to change and have at least taken the first, rudimentary steps. These are, nevertheless, still frequently limited to rather indistinct declarations of intent, or searches for short-term solutions whose actual net impact on sustainability is often unclear. Examples of this are artificial food enrichment with vitamins, or the cultivation of genetically modified (GM) plants. Still not evident, however, is a fundamental, pervasive paradigm change towards a truly sustainable redesign of the industry's business models. It remains to be seen how the industry will ultimately respond to the ever-increasing global pressure to change.

In this context, the conditions for achieving oekom Prime status will also be tightened for the foodstuffs industry over the coming years, with the ratings placing even more emphasis on corporate responsibility for the entire value-creation process: companies will in future have to be able to retrace their raw materials back to the last link of their supply chains, enabling more decisive responses, also where controversies are involved. Long-term supply relationships with fair pricing models are important elements here; and active supply-chain monitoring and management should be demonstrable, ideally through the definition of measurable goals and the provision of pertinent quantitative data (e.g. on GHG emissions and water consumption), as well as with progress reports. Only companies which take these issues seriously and tackle them with long-term strategies can fulfil their role as active crafters of the transformation processes, and continue to fulfil oekom research's tightening sustainability demands.

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Source:

72 http://www.fao.org/faostat/en/#data/RL/visualize

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4. Looking ahead

The findings gathered in this year's CR Review underline two things: firstly, the acceleration with which sustainability issues are gaining importance—where "importance" not only means the urgency of identifying solutions to problems such as climate change, but also with respect to the rising priority which e.g. legislators, businesses and investors are assigning the topic. Secondly, there are significant disparities in the ways in which companies and their business models are prepared for the changes which the described momentum will bring—a recognition which many investors are meanwhile factoring into their classical solvency considerations.

Increasing importance at many institutions and in many social groups is notable in that, at present, the issue of sustainability is struggling to compete with other topics—such as domestic security, tackling refugee flows, and job creation—which are currently dominating the political agenda in many countries. Also the rise in populist tendencies in Western democracies is less conducive to the political advocacy of sustainability issues.

In this situation, it seems ironic that—also because of its own massive environmental problems—a country such as China appears to have recognised the signs of the time and has prescribed the nation in its 13th Five Year Plan from 2016 to 2020 a further acceleration of its environmental endeavours, e.g. through massive investments in renewable energies and quotas for electric vehicle. With the financial markets also increasingly demanding ESG standards and wishing to invest in sustainable business models, even many global companies are advocating clear and strict climate goals and a low-carbon future. Furthermore, as shown in this year's CR Review, the number of companies without sustainability strategies continues to fall—even at an accelerating rate. These developments give reason for hope: that sustainability has meanwhile become so entrenched that even political setbacks in some countries will not seriously derail the necessary change processes.

The Living Planet Report 2016 published by WWF at the end of last year again emphasised how still more impetus is needed to further solutions to the world's sustainability challenges: biodiversity continues to decline worldwide—a 58 percent drop in animal populations has been observed over the past 40 years; and 239 million hectares of natural forest have been destroyed over the past 25. Moreover, many scientists doubt whether the enduring indecisiveness of politics and industry will suffice to limit global warming to the 2° or even 1.5° Celsius target.

Whatever the sustainability plan, one factor is also decisive for its success: the faster environmental hazards are systematically reduced, the better the starting point for the next steps. This will only work in alliance with market mechanisms, not in opposition to them. That renewable energy can already often be produced at lower cost than conventional energy is a very important step on this path. Equally realising this as soon as possible for the recycling of raw materials, for energy-efficient buildings and electrical appliances, for low-emission transportation designs, and for the protection of our soil and drinking-water resources should be our common goal. Next year's CR Review will explore whether we have come closer to reaching this goal.

oekom inside

oekom research is one of the world's leading rating agencies for sustainable investments. The agency analyses businesses and countries with respect to their environmental and social performance. As an experienced partner of institutional investors and financial service providers, oekom research identifies those equity and bond issuers whose businesses exercise a high level of responsibility towards society and the environment. Over 160 asset managers and asset owners in 13 countries regularly incorporate the rating agency's research into their investment decisions. As such, oekom research's analyses currently influence around EUR 1.5 trillion assets under management.

Our interdisciplinary team currently consists of over 100 people, 70 of whom are analysts and almost all of whom work at our head office in Munich. oekom research also has offices in Paris, London and New York, as well as further representations such as in the Netherlands.

The credibility of our analysts is decisive for oekom research's success. We regard two aspects in particular as being decisive for ensuring this: independence and competence. In particular, the business case and shareholder structure ensure independence at the agency level; at the analyst level, it is ensured by a strict code of conduct. The competence behind our ratings is based on the high scientific standards of our rating methodology and extensive qualification of our analysts through comprehensive and ongoing training.

As regards the quality of our rating processes, the market has for many years clearly recognised us as a leader ahead of our competitors. oekom research is the world's only sustainability rating agency with several years certification of compliance with the ARISTA standard, and in 2016 was also awarded the Deep Delivery Data Standard's Gold Standard.

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