

# Sustainably Successful?

Analysing, measuring and managing corporate sustainability  
with the Sustainable Value approach

Short Version

The present survey has been conducted under the umbrella of the research project “Sustainably successful? Analysing, measuring and managing corporate sustainability with the Sustainable Value approach” (In German: “NeW – Nachhaltig erfolgreich Wirtschaften”) by researchers of the following institutions:



IZT – Institute for Futures Studies and  
Technology Assessment,  
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Sustainable Development Research Centre  
(SDRC) and University of St Andrews,  
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A long version of this survey including all results and more information on the project is available in German language at [www.new-projekt.de](http://www.new-projekt.de).

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## In a Nutshell

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This short version of the survey "Sustainably successful? Analysing, measuring and managing corporate sustainability with the Sustainable Value approach" (In German: "NeW – Nachhaltig erfolgreich Wirtschaften") gives an overview of the methodology of the Sustainable Value approach and its application in the NeW-survey. This short version presents the results of an assessment of the sustainability performance of 28 German companies with the Sustainable Value approach.

The recently developed Sustainable Value approach measures sustainability performance of companies in monetary terms. The approach falls back on a basic rule of financial analysis: To create value, a company must use resources more efficiently than other companies. Sustainable Value therefore compares the resource use of a company to the resource use of a benchmark. The approach has been developed by Prof Frank Figge of the Sustainable Development Research Centre (SDRC) in Forres, UK, and Dr Tobias Hahn of IZT – Institute for Futures Studies and Technology Assessment in Berlin, Germany. It allows measuring and managing the use of environmental and social resources analogously to the way financial resources are commonly measured and managed.

The project "NeW – Nachhaltig erfolgreich Wirtschaften" is funded by the German Federal Ministry of Education and Research. In its first part, the sustainability performance of German companies has been assessed using the Sustainable Value approach. During a second phase of the project, the approach will be applied and tested in corporate practice. The NeW-survey assesses the sustainability performance of 28 German companies with regard to the use of ten economic, environmental and social resources. The results allow clear and unambiguous statements about the sustainability performance of companies: For example, in 2004 Merck used the resources considered in this survey 3,9 times more efficiently than the German economy on average and thus generated a Sustainable Value of € 1.5 billion. In other words, with an identical set of resources Merck generated € 1.5 billion more net value added than the German Economy would have achieved.

The NeW-survey has two central goals: First, it aims to demonstrate the applicability of the Sustainable Value approach under real world conditions. Therefore, the assessment of the 28 companies entirely relies on publicly available data. Second, the results intend to provide comparability and transparency. On the basis of this assessment, the reasons for differences in sustainability performances among companies can be analysed.

A full version of the NeW-survey in German language is available as a free download at [www.new-projekt.de](http://www.new-projekt.de).

## Introduction

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There is a growing consensus that the current way of doing business is not compatible with the general principles of sustainable development. Hence, it is not surprising that there is a growing interest in the sustainability performance of companies. An interesting question in this context is which companies do best in managing the conflicting goals of successful economic activity on the one hand and the sustainable use of financial, environmental and social resources on the other hand.

To answer this research question Prof Frank Figge of the Sustainable Development Research Centre (SDRC) in Forres, UK, and Dr Tobias Hahn of IZT – Institute for Futures Studies and Technology Assessment in Berlin, Germany, developed the Sustainable Value approach. The Sustainable Value approach represents a methodically new solution which builds on a long tradition. The Sustainable Value approach assesses the use of environmental and social resources in the same way in which the use of economic capital has been assessed for decades – following opportunity cost thinking. From an opportunity cost perspective the price of an environmental or social resource is identical with the foregone benefit of an alternative use of that resource. For the first time now, capital use on one hand and environmental and social resources on the other hand can be assessed in an analogous way. This assessment has another advantage: Resources are not only assessed in an identical way, but the results are also available in the same unit. Thus sustainability performance can be expressed in a single unit, e.g. Euro. In other words, the Sustainable Value approach allows for an integrated monetary triple-bottom-line assessment of corporate performance.

In the NeW-survey, such an integrated monetary triple-bottom-line assessment has been conducted for 28 German companies. However, it should be kept in mind that the survey only represents one possible application of the Sustainable Value approach. Other applications as well as the implementation of the Sustainable Value approach in corporate practice are currently being undertaken by the project partners and other institutions.

## The Sustainable Value Approach

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As mentioned above, the Sustainable Value approach compares the resource use of a company (or other organisational entities) to the resource use of a benchmark (e.g. a reference group or a performance goal). For every company under analysis the NeW-survey examines where more return would be created with the resources: in the company or in the benchmark. The Sustainable Value thus represents the excess value which is generated by companies using their economic, environmental and/or social resources more efficiently than a benchmark. For example, Bayer emitted 4.1 million tons of CO<sub>2</sub> in 2004. At the same time, Bayer generated a net value added of € 7.91 billion and thus € 1,931 per ton of CO<sub>2</sub>. If we now want to compare Bayer's performance to the performance of the German economy, we have to carry out the same calculation on the benchmark level: Overall, the German national economy emitted about 886 million

tons of CO<sub>2</sub> in 2004. At the same time, it generated a net domestic product of € 1,889 billion and thus € 2,133 per ton of CO<sub>2</sub> (see Figure 1).

In order to determine the opportunity costs of Bayer's CO<sub>2</sub>-emissions, we now have to calculate how much return the benchmark would have generated with Bayer's emissions. Therefore, we multiply Bayer's 4.1 million tons of CO<sub>2</sub> with the CO<sub>2</sub>-efficiency of the benchmark (4.1 million tons of CO<sub>2</sub> x € 2,133 per ton of CO<sub>2</sub> = € 8.7 billion). These € 8.7 billion present the opportunity costs of Bayer's CO<sub>2</sub>-emissions. We now compare the opportunity costs, i.e. the return the benchmark would have generated with the CO<sub>2</sub>-emissions, to the return the company actually generated with these emissions. In this example the benchmark would have generated a higher return with the resources than Bayer. In other words, in 2004 Bayer did not use its CO<sub>2</sub>-emissions in a value creating way. The value contribution of Bayer's CO<sub>2</sub>-emissions is therefore negative and amounts to € -827 million.

Resource	Amount of resources used by the company		Efficiency (€ per unit of resource)	Return created with the resources	Value contribution
CO <sub>2</sub> -emissions	4,100,000 t	Company	1,931 €/t	€ 7,916,000,000	€ -827,693,630
		Benchmark German economy	2,133 €/t	€ 8,743,693,630	

**Figure 1: Calculating Sustainable Value – The example of Bayer's CO<sub>2</sub>-emissions in 2004.**

These calculations follow the assessment logic of financial markets. To determine whether an investment created value, one compares the return of that investment to the return of a benchmark. If an investment, for example, yields a return of 7% and the market only yields a return of 4% the investment has earned its opportunity costs and outperforms the benchmark by 3%. In this case, an investment of € 1,000 would have generated a value of € 30.

To find out whether a company used its resources in a value-creating way, we apply the methodology described above to every resource considered in this survey. For every resource we compare the return that is generated by the company to the return the benchmark would have achieved with the resource (i.e. the opportunity costs). The spread between both figures is called value contribution. The value contribution thus shows how much more or less return the company has generated with the resource in comparison to the benchmark. In the last step of the evaluation the sum of all value contributions is divided by the number of resources considered in the assessment. The result of that division is called the Sustainable Value.

Resource	Amount of resources used by Bayer in 2004	Net Value Added of Bayer in 2004	Return of the German Economy in 2004 (Opportunity costs)	Value Contribution
Assets	€ 13,574,000,000	€ 7,916,000,000	- € 3,755,952,674 =	€ 4,160,047,326
CO <sub>2</sub> -emissions	4,100,000 t	€ 7,916,000,000	- € 8,743,693,630 =	€ -827,693,630
NO <sub>x</sub> -emissions	4,300 t	€ 7,916,000,000	- € 5,183,468,712 =	€ 2,732,531,288
SO <sub>x</sub> -emissions	4,200 t	€ 7,916,000,000	- € 14,108,108,253 =	€ -6,192,108,253
Waste generated	700,000 t	€ 7,916,000,000	- € 3,883,765,393 =	€ 4,032,234,607
Water use	511,000,000 m <sup>3</sup>	€ 7,916,000,000	- € 23,006,627,652 =	€ -15,090,627,652
VOC-emissions	4,500 t	€ 7,916,000,000	- € 6,888,522,764 =	€ 1,027,477,236
Dust-emissions	500 t	€ 7,916,000,000	- € 5,008,759,855 =	€ 2,907,240,145
Number of Work Accidents	279	€ 7,916,000,000	- € 484,150,617 =	€ 7,431,849,383
Number of Employees	93,783	€ 7,916,000,000	- € 5,003,048,822 =	€ 2,912,951,178
Sustainable Value of Bayer in 2004		€ 7,916,000,000	- € 7,606,609,837 =	€ 309,390,163

**Figure 2: Calculating Sustainable Value – The full picture of Bayer's Sustainable Value in 2004.**

Figure 2 shows that with a bundle of ten resources, Bayer generated a Sustainable Value of € 309 million in 2004. In other words, Bayer managed to generate € 309 million more net value added with its set of resources than the average company in the German economy. The Sustainable Value as an absolute figure thus shows, how much more (positive Sustainable Value) or less (negative Sustainable Value) return a company generates with a given set of resources in comparison to a benchmark.

As an absolute monetary figure Sustainable Value depends on company size. Large companies generally have higher (positive or negative) Sustainable Value figures. We tackle this problem by relating the return of a company to another indicator representing the size of the company. The resulting indicator is called the Return to Cost Ratio (RCR). The Return to Cost Ratio puts the return of a company in relation to the return the benchmark would have created with the same set of resources (opportunity costs). In the NeW-survey we consequently divide the net value added of the company by the return the German economy would have generated with the resources.

Resource	Amount of resources used by Bayer in 2004	Net Value Added of Bayer in 2004	Return of the German Economy in 2004 (Opportunity costs)	Value Contribution
Sustainable Value Bayer 2004		€ 7,916,000,000	- € 7,606,609,837 =	€ 309,390,163
Return to Cost Ratio 2004		1,04	1	1:1

**Figure 3: Calculation of the Return to Cost Ratio of Bayer in 2004**

In 2004, the net value added of Bayer was 1.04 times higher than its opportunity costs. In other words, Bayer used its ten resources slightly more efficiently than the German national economy on average.

The RCR shows by which factor a company uses its resources more or less efficiently than a benchmark. A RCR > 1 thus shows that a company is using its resources more efficiently than the benchmark. A RCR < 1 stipulates that a company is using its resources less efficiently than the benchmark. A RCR of 1 : 2 hence shows that a company is using its resources only half as efficiently than the benchmark. Generally speaking the RCR

represents a relative measure of corporate sustainability performance in relation to a benchmark.

In the following, the scope of the application of the Sustainable Value approach in the NeW-survey will be presented.

### **Scope of the NeW-Survey**

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The NeW-survey constitutes the empirical part of the project. The survey assesses the sustainability performance of 28 German companies from 13 sectors with regard to ten indicators using the Sustainable Value approach. The indicators considered in this survey are:

- Non-financial assets
- CO<sub>2</sub>-emissions
- NO<sub>x</sub>-emissions
- SO<sub>x</sub>-emissions
- Dust emissions
- VOC-emissions
- Water use
- Waste generated
- Number of employees
- Number of work accidents

For the first time we apply two different benchmarks to assess corporate sustainability performance with the Sustainable Value approach. In the first scenario, we benchmark corporate performance against the German economy. This encompasses a past performance scenario covering the years 2000 to 2004 as well as a future scenario for the year 2010. The second benchmark used in this survey is an industry-specific benchmark. However, as there is no suitable publicly available data regarding the use of environmental and social resources by industries, the industry-specific benchmarks were constructed from the data of the companies of an industry assessed in the NeW-survey. All data used in this survey derives from public sources. Main sources of corporate data were annual reports and corporate environmental or sustainability reports. Main sources of benchmark data were the German statistical yearbook and the national environmental accounts.

### **Results of the NeW-Survey**

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This chapter gives an overview of the most important results of the NeW-Survey. In the full version of this survey you will find all results, including an in-depth discussion of the future scenario and all industry-specific benchmarks. Furthermore, you will find a profile for each of the 28 companies with detailed results for all indicators.

## Results with the German National Economy as the Benchmark

A Sustainable Value assessment with the German national economy as a benchmark shows the value that companies create with their resources in relation to the national economy on average. Table 1 gives an overview over the results for 2004.

Company	RCR	Sustainable Value (in €mill.)	Company	RCR	Sustainable Value (in €mill.)
BMW	5 : 1	8,224	Axel Springer	1.6 : 1	279
Bosch	3.9 : 1	10,362	VW	1.6 : 1	5,339
Merck	3.9 : 1	1,645	Bayer	1 : 1	309
Krones	3.9 : 1	430	K+S	1 : 1.7	-515
Schering	3.8 : 1	1,666	DB	1 : 1.9	-5,540
Heidelberger Druck	3.8 : 1	958	BASF	1 : 2.2	-12,908
Boehringer Ingelheim	3.6 : 1	2,767	Cognis	1 : 2.7	-1,045
Miele	3.5 : 1	450	Degussa	1 : 3.9	-10,878
Deutsche Telekom	2.8 : 1	9,296	Nordzucker	1 : 5	-923
Sirona	2.6 : 1	68	Celanese	1 : 7.1	-5,398
DaimlerChrysler	2.5 : 1	15,208	Thyssen Krupp Steel	1 : 7.4	-14,708
MAN	2.4 : 1	2,288	EON	1 : 14	-144,337
ZF Friedrichshafen	1.7 : 1	1,298	RWE	1 : 14.3	-148,996
Henkel	1.7 : 1	1,188	DSK	n.a.	-2,021

n.a. = not ascertainable

**Table 1: Sustainable Value creation of 28 German companies in 2004**

In this scenario, DaimlerChrysler generated the highest absolute Sustainable Value. If the resources employed by DaimlerChrysler had instead been used in the German economy on average, approximately € 15 billion less net value added would have been created. Comparing the companies on the basis of the Return to Cost Ratio (RCR), i.e. eliminating the size-effect, BMW is using its resources most efficiently: With a RCR of 5 : 1, BMW is using the ten resources considered in this survey five times more efficiently than the average company in the German economy. In other words, BMW generates five times more net value added with those resources than the German national economy on average. DaimlerChrysler has an RCR of 2.5 : 1 in 2004, which leads to a mid-field position among the 28 companies examined in this survey. DaimlerChrysler thus uses its resources only half as efficiently as BMW. Henkel and Axel Springer use their economic, environmental and social resources 1.7 and 1.6 times more efficiently than the German national economy, respectively. In other words, with the resources it takes the German national economy to generate one Euro of net domestic product, Henkel and Axel Springer generate € 1.70 and € 1.60, respectively. At the end of the list we find DSK (the only German coal mining company). Since the net value added of DSK is negative after deducting subsidies, no meaningful Return to Cost Ratio could be calculated. However, because no positive value added is generated with the resources used by DSK we could integrate it into the list as the least efficient company. With EON and RWE there are two utilities at the far bottom end of this list. This is due to the high resource intensity of utilities in comparison to the German national economy on average.

## Results with Industry-Specific Benchmarks

Some companies examined in this survey have been assessed against an industry-specific benchmark in addition to the analysis with the German national economy as benchmark. The results with an industry-specific benchmark show how efficiently a company uses its resources in relation to other companies within the industry that have been assessed in this survey. The following table illustrates the assessment with an industry-specific benchmark by using the chemicals sector as an example.

Return to Cost Ratios with benchmark chemical industry			
Company	2004	2003	2002
Bayer	1.6 : 1	1.1 : 1	1.4 : 1
BASF	1.1 : 1	1.2 : 1	1.2 : 1
K+S	1 : 1.1	1 : 1	1 : 1.2
Cognis	1 : 1.3	1 : 1.2	1 : 1.1
Degussa	1 : 1.6	1 : 1.4	1 : 1.5
Celanese	1 : 2.8	1 : 2.9	1 : 3.2

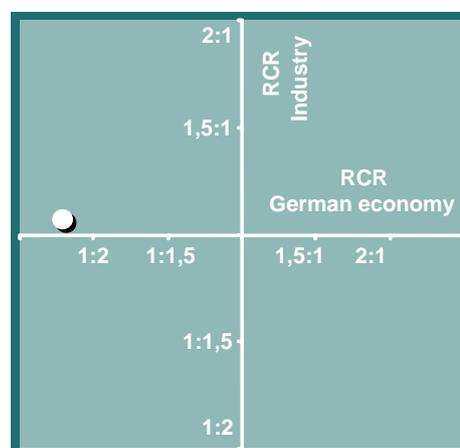
**Table 2: Return to Cost Ratios with benchmark chemical industry**

Assessed against the average performance of the six chemical companies considered in the NeW-survey, in 2004 Bayer used its resources 1.6 times more efficiently than its competitors on average. Celanese, on the other hand, used its resources three times less efficiently than the average of the six chemical companies considered. In direct comparison with Celanese, BASF generated more than three times more net value added with its economic, environmental and social resources than Celanese. This number can be obtained by relating the Return to Cost Ratios of both companies to each other ( $1.1/(1/2.8)=3.1$ ).

## Integrating both Perspectives

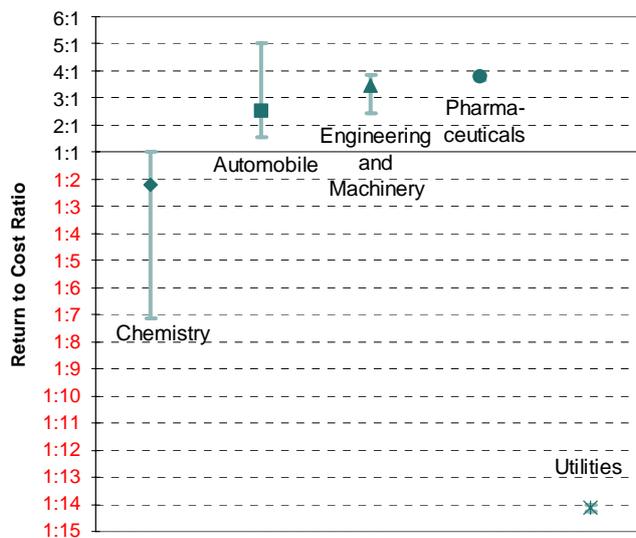
The results of the assessment with an industry-specific benchmark can easily be integrated with the results obtained in the assessment with the German national economy as benchmark. Figure 4 shows BASF's performance in a matrix that covers both benchmarks.

As can be seen, BASF is using its economic, environmental and social resources half as efficiently as the German economy on average (see x-axis) and slightly more efficiently than the six chemical companies analysed in the NeW-survey on average (see y-axis).



**Figure 4: RCR-Matrix of BASF in 2004**

The reasons behind the differences in the assessment results of the companies considered are of course diverse and can only be identified on the basis of a more detailed



analysis of the individual companies. Obviously, one influential factor when comparing companies against a cross-sector benchmark is sector affiliation. When using an economy-wide benchmark, companies from capital- and resource intensive sectors tend to have lower results.

**Figure 5: Distribution of RCRs across and within industries in 2004**

Nevertheless, even within industries there are considerable differences in sustainability performance. Figure 5 shows both effects: On the one hand comparing the average sustainability performance of different industries reveals significant deviations, and on the other hand the range of sustainability performance among companies of one sector amounts up to factor 7 in the case of the chemical industry.

## Conclusions and Implications

The Sustainable Value approach allows a monetary assessment of the resource efficiency of different economic activities. This holds for companies as well as business units, industries or even products. So far, a practical application of the Sustainable Value approach to assess value chains or life cycles has not been possible due to the limited availability of environmental and social data. In the NeW-survey, the assessment of corporate sustainability is restricted to the resource use within companies. Activities along the value chain are not considered, i.e. the sustainability performance of suppliers and customers as well as product-specific sustainability issues are not taken into account. It is, however, methodically feasible to conduct assessments that go beyond company borders.

For some companies assessed in the NeW-survey, we used a sector-specific benchmark in addition to the analysis with the German national economy as benchmark in order to show the effect different benchmarks can have on the results of the assessment. When doing a Sustainable Value analysis, the benchmark should be chosen according to the decision making context of the assessment. Sustainable Value assessments allow a high degree of flexibility. However, to obtain meaningful results, this flexibility has to be treated with consideration. The results in this survey thus only represent one possible application of the Sustainable Value approach. The parameters used in the survey proved to be useful to answer the underlying research questions of this survey. In other contexts different benchmarks, indicators and resources might be necessary to produce meaningful results. When discussing the results of the NeW-survey, one should there-

fore distinguish between the Sustainable Value approach in general and its specific application in the NeW-survey.

The Sustainable Value approach is the first value-based approach to apply opportunity cost thinking to sustainability issues. The approach builds on the well-established assessment logic of financial markets. On financial markets, it is often argued that opportunity cost thinking improves the resource efficiency of a market economy and therefore benefits society as a whole. The Sustainable Value approach provides a tool to extend this positive effect on environmental and social resources. The results of this survey do, however, not suggest that resource intensive businesses, such as the utilities sector, should be shut down completely. The application of the Sustainable Value approach with the German national economy as a benchmark shows the additional net domestic product that could be gained by an improved sustainability performance across industries. This potential might be realised by a structural change for sustainability. A sector-specific analysis cannot grasp that potential.

The Sustainable Value approach measures sustainability performance in monetary terms and thus undertakes a quantitative assessment. Purely qualitative sustainability issues cannot be integrated in the analysis. Furthermore, it is a prerequisite for an assessment with the Sustainable Value approach that a company disposes of provides clearly defined environmental and social data that covers the same scope of business activities as the financial data. One finding of the NeW-survey was that only a minority of companies provides sustainability reports that meet these requirements. All of the 28 companies analysed in this survey, regardless of their sustainability performance, are excellent sustainability reporters and should be regarded as pioneers in this context. Several major German corporations such as Siemens, Deutsche Post, EnBW or Lufthansa, as well as all German logistics companies except Deutsche Bahn, could not be included in this survey, since these companies do not provide sufficient environmental and social performance data.

With the Sustainable Value approach it is now possible to assess sustainability performance in monetary terms and in line with the logic of managers and financial markets. This is the most prominent advantage of the approach. Finally, environmental and social resources can be monitored and managed in the same way capital has been monitored and managed for several decades. As a consequence, the one-dimensional orientation of financial markets and managers towards return on capital can be overcome. Hence, environmental and social resources can be integrated into corporate performance measurement and monitoring. In place of an optimised return on capital, companies can now aim towards high sustainability efficiency and operate in line with the general principles of sustainable development. The results of this survey demonstrate this tremendous potential and show at one glance which German companies use their economic, environmental and social resources most efficiently and thus create Sustainable Value.

## Further information

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A full version of this survey in German language is available as a free download at [www.new-projekt.de](http://www.new-projekt.de), where you will also find further information on the NeW-Project.

At [www.sustainablevalue.com](http://www.sustainablevalue.com) you can also find further background information on the Sustainable Value approach in English.

At [www.advance-project.org](http://www.advance-project.org) you will find an application of the Sustainable Value approach to the assessment of environmental performance of 65 European companies.

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