
Sustainable Value creation among companies in the manufacturing sector

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Abstract: In this paper, we present empirical results of a study on the creation of Sustainable Value among European manufacturing companies. As sustainable development is a future oriented concept we assess the use of environmental resources in companies in the light of the EU15 performance targets for 2010. By using the Sustainable Value approach and based on publicly available company data we measure in monetary terms how individual companies perform vis-à-vis the 2010 performance targets already today. This shows the specific exposure and vulnerability of companies to more stringent policy regimes, and allows meaningful comparisons between both companies and sectors.

Keywords: sustainable value; corporate environmental performance; sustainable development; Lisbon strategy; European environmental policy targets.

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1 Background

Companies use economic, environmental and social resources to produce goods and services that help society to satisfy its needs. It is this simple relationship that makes companies at the same time a driver and a burden to sustainable development.

As producers of goods and services they help to satisfy needs, which makes them a driver of sustainable development. To the extent to which they use up economic, environmental and social resources they prevent current and future generations from satisfying their own needs which makes them a burden to sustainable development. Companies therefore face a trade-off between the production of goods and services, something that is generally appreciated, and the use of economic, environmental and social resources, which is considered to be a burden. The value that companies create in terms of their contribution to sustainable development depends on how good they are at reconciling these conflicting goals.

Sustainable development is, as the term insinuates, a forward looking concept. It is therefore not enough to merely look at present performance. The future performance of companies will be determined by how good companies will be at producing goods and services that satisfy needs while economising economic, environmental and social resources in the future.

Society defines in political processes the goalposts of sustainable development. These goals are apparent e.g., in the shape of international treaties or political agreements that define future overall resource use or resolutions on expected economic growth. In combination, they define the hurdle that companies will have to meet on average to contribute to the societal goals of sustainable development. Only if all companies meet these targets on average, society will move on this pre-defined path to sustainable development.

In this paper we show how to assess corporate sustainable performance in monetary terms using the SV approach. The more companies create Sustainable Value, the better they reconcile the conflicting targets of the production of goods and services and resource use.

Our starting point is the set of economic and environmental performance goals that the EU has agreed upon. In the economic domain, the Lisbon strategy has set the goal to develop the EU into the most competitive economic region of the world by 2010. Initially, an average yearly growth rate of 3% was envisaged (EC, 2000). At the same time, the EU has passed a series of environmental performance targets such as the EU burden sharing agreement (European Communities, 2002) based on the Kyoto protocol, or the NEC directive to reduce air emissions (European Communities, 2001) based on the Gothenburg protocol. In order to assess whether and to which degree companies contribute to these goals, corporate performance has to be measured accordingly. However, currently corporate performance is only measured based on economic aspects. Environmental and social aspects are often only considered to the degree to which they

further economic performance. Prominent examples are studies that look at the question “Does it pay to be green?” (Bragdon and Marlin, 1972; Alexander and Buchholtz, 1978; Brown and Perry, 1994; Cohen et al., 1995; Epstein, 1997; Schepers and Sethi, 2003). The hidden value of good environmental and social performers that do not meet economic performance goals today is widely ignored. Put provocatively, these studies do not look at the contributions companies are making to sustainable development but at sustainability-related contributions to shareholders.

Next to these approaches there exist numerous efforts to assess the environmental performance of companies, such as e.g., environmental impact assessment. However, most of these approaches fall short of translating environmental concerns into the language of business decision makers. Rather, most of the existing approaches remain in the realm of natural sciences and technical solutions. Overall, we thus face the challenge of expressing company performance vis-à-vis the European environmental and economic performance in an integrated but yet understandable way.

In this paper, we present the methodology and the results of the ADVANCE survey in which we assessed the performance of 65 European manufacturing companies with regard to the European performance targets. ADVANCE utilises the SV approach (Figge, 2001; Figge and Hahn, 2004b, 2004c; 2005a, 2005c). This allows us to express the contribution of European companies to the economic and environmental performance targets of the EU in monetary terms.

In the following, we first provide a brief introduction to the SV methodology that was applied in the ADVANCE survey (Section 2). In Section 3 of the paper, we present the main findings and results of the ADVANCE survey, before Section 4 discusses the major implications of our findings. Section 5 concludes the paper and provides an outlook to future applications.

2 Methodology

This paper builds on some of the key results of the ADVANCE survey (The ADVANCE Project, 2006). In the ADVANCE survey, we assessed the environmental performance of 65 European companies in monetary terms using the SV approach. The ADVANCE survey represents the first broad scale application of the SV approach under real world conditions. The survey is based on data that is publicly available. Before introducing the specific approach used in the ADVANCE survey in order to assess the contribution of companies to the EU performance targets, we first provide a brief explanation of the underlying SV approach.

2.1 The Sustainable Value (SV) approach in brief

SV measures corporate sustainable performance in monetary terms (Figge and Hahn, 2004c, 2005a, 2005c). For this purpose, it falls back on the well established logic of financial analysis. Conventionally, investors and analysts concentrate on the return on capital. When assessing their investment performance, investors face an interesting problem. To assess investment performance they compare the return of their investment to the return of a benchmark. Only an investment that beats the benchmark creates value. This reasoning is built on a very fundamental rule. Value is created whenever the return

of an investment exceeds its costs. The benchmark therefore defines the cost of capital. And only an investment that covers the cost of capital creates value.

However, companies use not only economic capital but also environmental and social resources to create a return. In order to assess corporate sustainable performance we need to assess the use of the entire bundle of resources. SV thus applies the logic of investment performance assessment to environmental and social resources. To create value the return of using environmental and social resources must cover the costs of the resources. SV therefore compares the resource use of a company to a benchmark.

A company that emits 10 t of CO₂ to create 100 € Gross Value Added has a CO₂-efficiency of 10 €/t of CO₂. If other companies create only 6 € Gross Value Added per ton of CO₂ on average, then the company outperforms the benchmark by 4 € Gross Value Added per ton of CO₂. If the company uses 10 tons of CO₂ altogether, it creates a total value of 40 €. Figure 1 illustrates this fundamental line of thinking of the SV approach.

Figure 1 Assessment logic of the Sustainable Value approach

	10 t			
	Company	-	Benchmark	Value contribution
Efficiency	10 € / ton of CO ₂	-	6 € / ton of CO ₂	= 4 € / ton of CO ₂
Effectiveness	100 €	-	60 €	= 40 €

Source: Based on Figge and Hahn (2005d)

SV applies this line of thinking to all kinds of resources that companies use. It expresses the use of resources other than economic capital in monetary terms. As a result, SV shows in monetary terms the value that a company creates or destroys by the use of a set of different resources. SV extends the logic of financial markets to cover more than economic capital.

2.2 The scope of the ADVANCE survey

ADVANCE applies the SV approach to assess the use of seven environmental resources by 65 European companies from 16 countries and 18 different sectors. The seven environmental resources that we take into account are:

- carbon dioxide (CO₂)-emissions
- nitrogen oxide (NO_x)-emissions
- sulphur oxide (SO_x)-emissions
- emissions of Volatile Organic Compounds (VOC)
- methane (CH₄)-emissions
- waste generation
- water use.

As pointed out above, the SV approach compares the efficiency of a company to the efficiency of a benchmark. Therefore, the return of a company as well as of the benchmark has to be measured in addition to the use of resources. On the benchmark level, the ADVANCE survey used the Gross Domestic Product (GDP) as the return figure. This corresponds to Gross Value Added which was used as the return figure on the company level.

The large majority of the underlying company performance information was obtained through the analysis of publicly available company reports. Companies' economic and environmental data was obtained through the study of annual reports, financial statements and environmental or sustainability reports as well as the respective company websites. In cases where there remained gaps in data availability (or where we perceived data availability problems), the respective companies were contacted directly.

2.3 The assessment of corporate contributions to EU targets in the ADVANCE survey

As pointed out above, a company creates value when it generates more return with its resources than the benchmark. The SV approach can be used with different benchmarks depending on the desired explanatory power of the results. ADVANCE uses the EU15 as the benchmark. More specifically, the ADVANCE survey considers two different assessment scenarios. In the past performance scenario, the survey assessed company performance over the time period of 2001–2003 against the benchmark of the EU15 performance in the respective years. However, in the context of this paper, the future performance scenario is of major interest. In the future performance scenario corporate performance is assessed against the 2010 performance targets of the EU15. The results of the future performance scenario thus show which companies contribute to achieving the EU15 performance targets already today. In the following, before explaining the methodology in more detail, the EU15 performance targets that are used as the benchmark are briefly introduced.

2.3.1 EU15 performance targets used as benchmark

As already mentioned above, the ADVANCE survey uses the EU15 economic and environmental performance targets for 2010 as the benchmark to assess the future performance of companies. This reflects the fact that in the EU15 environmental resources are not yet used in a sustainable way presently. Therefore, the EU has implemented policy goals to reduce the use of environmental resources and to alleviate environmental burdens. In addition the EU strives to be the most competitive region of the world by 2010. In the Lisbon declaration, the EU has set itself as a performance target to achieve a GDP growth of 3% each year until 2010 (EC, 2000). Table 1 shows the economic and environmental performance targets as well as the respective policy background and sources for the targets that have been considered in the ADVANCE survey.

Table 1 EU15 policy targets for 2010

	2010 Target			
	Relative	Absolute	Policy background	Sources
<i>Economic goals</i>				
GDP growth	3% p.a.	11,454 billion €	Lisbon declaration	EC (2000)
<i>Environmental goals</i>				
CO ₂ -emissions	8% reduction compared to 1990	3,067,902,427 t	EU burden sharing agreement	European Communities (2002)
NO _x -emissions	–	5,923,000 t	NEC Directive, Annex II	European Communities (2001)
SO _x -emissions	–	3,634,000 t	NEC Directive, Annex II	European Communities (2001)
Waste generation	20% reduction compared to 2000	1,168,475,530 t	No EU targets available for overall waste reduction. In a preliminary version of Decision 1600/2002/EC there is a 20% reduction target for municipal waste that is applied to overall waste here	Based on European Commission (2001)
Water use	Extrapolation of downward trend	218,074,000,000 m ³	No EU targets for water use available. Therefore, the existing downward trend of water use has been extrapolated to the year 2010	Based on European Environment Agency (2003)
VOC-emissions	–	5,581,000 t	NEC Directive, Annex II	European Communities (2001)
CH ₄ -emissions	8% reduction compared to 1990	19,757,629 t	EU burden sharing agreement	de Leeuw (2002) and European Communities (2002)

Source: The ADVANCE Project (2006)

As a result of the quantified targets for 2010, we know how efficiently the EU15 wants to use environmental resources by 2010. With these target efficiencies we calculate how much Gross Value Added companies must create with their environmental resources to create SV in the future. In other words, this shows how efficiently resources have to be used in 2010 for the performance targets to be met. Table 2 shows the EU15 target efficiencies for 2010. These efficiencies are calculated by dividing the target GDP for 2010 by the targeted amount of resources used. At the same time, these efficiencies

determine the opportunity costs in our future performance scenario. Companies thus only create a positive SV if they are using their resources more efficiently than is required by the EU15 performance targets.

Table 2 Target efficiencies of the EU15 for 2010

CO ₂ -emissions	3,733 €/t
NO _x -emissions	1,933,747 €/t
SO _x -emissions	3,151,784 €/t
Waste generated	9,802 €/t
Water used	53 €/m ³
VOC-emissions	2,052,246 €/t
CH ₄ -emissions	579,704 €/t

Source: The ADVANCE Project (2006)

The following section shows how these target efficiencies are used in the ADVANCE survey to calculate the future SV of European companies. This allows to express the contribution of individual companies to the environmental and economic EU performance targets in an integrated monetary indicator.

2.3.2 *The five steps of the assessment*

The SV of companies is assessed in five steps. As already briefly described above, the SV methodology compares the efficiency of the use of resources in a company to the efficiency of a benchmark. In one of the assessment scenarios, the ADVANCE survey considers environmental and economic policy targets of the EU15 for 2010 as the benchmark. As a result, this assessment shows by how much companies contribute to the simultaneous achievement of the set of different performance targets of the EU. The assessment of the contribution of companies to the EU15 policy targets comprises the following five steps:

- 1 How much of a resource does the company use?
- 2 How much return does the company create with these resources?
- 3 How much return would the benchmark create with these resources?
- 4 Which resources are used in a value-creating way by the company and which are not?
- 5 How much SV does the company create?

In the first step the amount of resources the company uses to create a return is determined. In principle, the SV approach can cover economic, environmental and social resources. This has been demonstrated in several case studies (Figge, 2001; Figge and Hahn, 2004a, 2004b, 2005a, 2005b, 2005d). The ADVANCE survey concentrates on the assessment of the use of environmental resources in companies and considers the seven different environmental resources listed above. The amount of resources used is measured in physical units, such as tons or m³.

In the second step, it is determined how much return the company creates with the set of resources described in the first step. Here, the ADVANCE survey looks at Gross Value Added of companies. This is the return that is created for shareholders and creditors, the government/state and the personnel. Gross Value Added represents a company's contribution to the GDP of an economy.

In the third step, the benchmark comes into play. In the context of this paper, the benchmark is constituted by the EU15 target efficiencies for the year 2010. It is thus determined how much return a company must create with its resources in order to act in line with the economic and environmental performance targets of the EU15 (future opportunity costs) (Figge, 2001). To calculate the future opportunity costs we multiply the amount of resources used by the company with the target eco-efficiencies. This means that we compare the efficiency of resource use of each company with the target efficiency of resource use in the EU for the year 2010. The target efficiency of the benchmark thus constitutes a hurdle that companies must pass. From the viewpoint of sustainability it is very interesting to see how much value companies must create *in the future* with the resources they are using. The EU15 has expectations with regard to both economic growth and the amount of resources we want to use in the future. The former is for example subject of the Lisbon declaration (EC, 2000), which aims at a 3% yearly growth rate of GDP in the EU15. Environmental targets are reflected in agreements such as the EU burden sharing agreement which requires an overall reduction of greenhouse gases in the EU15 of 8% by 2008 (compared to 1990) (European Communities, 2002). Combined, both expectations define the eco-efficiency our society and thus also our companies will have to at least meet in the future (see Tables 1 and 2).

In the fourth step, we determine which resources are used by the company in a value-creating way. For this purpose, we compare the return the company creates with the return the efficiency targets prescribe with these resources (future opportunity costs). The return that the company creates corresponds to its Gross Value Added (see step 2). The future opportunity costs have been calculated in step 3. In step 4, we now subtract the future opportunity costs of each resource from the Gross Value Added of the company. The result of this step is called value contribution. It shows how much more or less value a company creates with a resource compared to the benchmark, i.e., compared to the hurdle defined by the EU targets.

In the preceding step we have calculated how much value each individual resource creates. However, companies use more than one resource. In the fifth step it is now determined how much value is created by the entire bundle of resources. Up to this point, we have assumed that each individual resource creates the entire value by itself. Simply summing up all value contributions would thus result in double counting. Therefore, to calculate SV we divide the sum of the value contributions by the number of resources considered. The result shows how much value is created or destroyed through the use of a set of environmental resources in a company in the light of the EU15 environmental and economic performance targets for 2010. In other words, the result shows by how much a company contributes to the achievement of the EU performance goals already today.

Figure 2 gives an example of calculating future Sustainable Value, using the case of Pirelli. All five steps of the assessment are clearly marked in the figure. For example, in the case of Pirelli's CO₂-emissions, the benchmark would have created a return of $(1,370,613 \text{ t} \times 3,733 \text{ €/t}) = 5,116,989,610 \text{ €}$ with the amount of CO₂ emitted by Pirelli. This results in a negative value contribution of $-3,090,989,610 \text{ €}$. Regarding Pirelli's

SO_x-emissions, it can be seen that the company has created a return of 2,026,000,000 € without emitting any SO_x. The benchmark would not have created any return on the basis of zero SO_x-emissions. Therefore, in this case the value contribution equals Pirelli's return of 2,026,000,000 €. Taking into account all seven resources employed in 2003, Pirelli did not use its bundle of environmental resources efficiently enough to measure up to the EU15 performance targets. Rather, in the light of the 2010 performance targets the resource use by Pirelli in 2003 destroyed a value of almost 600 € Mio. This means that with its present performance Pirelli falls short of meeting the economic and environmental performance targets of the EU15 for 2010 and will have to improve to create some additional € 600 Mio. Gross Value Added out of the resources it used in 2003 in order to meet these targets.

Figure 2 Future Sustainable Value of Pirelli

	Step 1	Step 2	Step 3	Step 4
	Amount of resources used in 2003	Return of Pirelli	2010 target return EU15 = Opportunity cost	Value Contribution
CO ₂ -emissions [t]	1,370,613	2,026,000,000 €	- 5,116,989,610 €	= -3,090,989,610 €
NO _x -emissions [t]	772	2,026,000,000 €	- 1,492,038,346 €	= 533,961,654 €
SO _x -emissions [t]	0	2,026,000,000 €	0 €	= 2,026,000,000 €
Waste generated [t]	171,867	2,026,000,000 €	- 1,684,671,208 €	= 341,328,792 €
Water used [m ³]	29,960,663	2,026,000,000 €	- 1,573,580,193 €	= 452,419,807 €
VOC-emissions [t]	4,111	2,026,000,000 €	- 8,436,781,514 €	= -6,410,781,514 €
CH ₄ -emissions [t]	0	2,026,000,000 €	0 €	= 2,026,000,000 €
Sustainable Value 2003 > 2010		2,026,000,000 €	- 2,614,865,839 €	= -588,865,839 €

	1	1.3	Step 5
Return to Cost Ratio			

Source: The ADVANCE Project (2006)

In addition, it can be seen that the negative performance of Pirelli vis-à-vis the European performance goals is mainly due to its CO₂- and VOC-performance. The use of these two environmental resources proves to be value-destroying when benchmarked against the EU targets and thus represent areas of weakness and necessary improvement.

2.3.3 The role of company size

When comparing companies, a size effect gets in the way. Usually, large companies are expected to have larger profit, sales or cash flow figures. The same applies to SV figures. Therefore company size should be taken into account when comparing different companies. For this purpose, in ADVANCE we use the so-called Return to Cost Ratio (RCR). The RCR compares the return of a company to the return the benchmark would have created with the resources of the company (opportunity costs). Thus, it is a typical benefit-to-cost-ratio. In the context of performance targets as benchmark, a RCR larger (smaller) than 1 indicates that the company yields more (less) return per unit of resource as prescribed by the target efficiencies. In other words, it shows that the company uses its bundle of resources more (less) efficiently than the targets that define the benchmark. More specifically, the RCR determines by which factor the overall efficiency of the resource use of a company exceeds or falls short of the target efficiencies as envisaged by the EU15 economic and environmental performance targets for 2010.

The calculation of the RCR is illustrated in the lower lines of Figure 2 using the case of Pirelli. It can be seen that the future opportunity costs, i.e., the level of return that follows from the EU15 performance targets for the resource bundle of Pirelli, exceed the return of Pirelli in 2003 by a factor of 1.3. This means that in 2003, overall Pirelli missed the economic and environmental performance targets of the EU15 for 2010 by a factor of 1.3. Where Pirelli created € 1 of return with its environmental resources in 2003 the benchmark is expected to create € 1.3 return in 2010. The RCR of 1 : 1.3 thus also shows that Pirelli will only contribute to the achievement of the European performance targets if they succeed in improving their overall eco-efficiency by a factor of 1.3.

3 Results

In this section, we present the results of the ADVANCE survey concerning the contribution of 65 European manufacturing companies to the EU15 economic and environmental performance targets. First, we provide an overview on the range of the results and highlight the performance of the best and the worst performing companies. This is followed by the results of an in-depth analysis of the results which shows the trends and influence factors behind companies' performance.

3.1 Overview on the results

Table 3 displays the 20 top performing companies of the ADVANCE survey with regard to the EU15 targets for 2010. The ranking is sorted according to the RCR of the companies. The results show that these companies exceed the overall targeted future eco-efficiency already in 2003. In 2003, the best performing companies use their environmental resources more than three times more efficiently than prescribed by the economic and environmental performance targets of the EU15 for the year 2010.

Table 3 Top 20 performing companies vis-à-vis EU15 performance targets

	<i>Company</i>	<i>RCR 2003 > 2010</i>	<i>Sustainable Value 2003 > 2010 (€)</i>
1	Novonordisk	3.6 : 1	1,675,499,967
2	Gorenje	3.5 : 1	162,107,899
3	Airbus	3.4 : 1	4,523,246,485
4	Schering	3 : 1	1,677,996,126
5	BMW	3 : 1	8,514,813,453
6	Philips	2.7 : 1	6,660,947,431
7	NedCar	2.7 : 1	318,600,391
8	DaimlerChrysler	2.7 : 1	26,133,559,478
9	ABB	2.5 : 1	4,564,400,666
10	Heidelberger Druckmaschinen	2.5 : 1	896,414,327
11	Robert Bosch GmbH	2.4 : 1	9,127,352,912
12	MAN	2.2 : 1	2,630,188,140
13	Agfa-Gevaert	2.2 : 1	1,126,670,350

Table 3 Top 20 performing companies vis-à-vis EU15 performance targets (continued)

	<i>Company</i>	<i>RCR 2003 > 2010</i>	<i>Sustainable Value 2003 > 2010 (€)</i>
14	AstraZeneca	2 : 1	4,570,525,310
15	Volvo	2 : 1	2,882,359,807
16	STMicroelectronics	1.9 : 1	1,612,847,924
17	Henkel	1.8 : 1	1,280,626,186
18	Scania	1.8 : 1	818,437,840
19	PSA	1.6 : 1	3,665,294,761
20	Atlas Copco	1.5 : 1	697,900,393

Source: The ADVANCE Project (2006)

The last column in Table 3 shows the absolute value that is created by the companies through the efficient use of their environmental resources. Obviously, large companies use larger amounts of resources and thus produce larger (positive or negative) absolute SV figures. It is thus not a surprise that DaimlerChrysler produces the highest SV in this study. Benchmarked against the 2010 performance targets, DaimlerChrysler's use of environmental resources produces a positive value of more than € 26 billion. However, if we take company size into account, DaimlerChrysler ranks eighth with a RCR of 2.7 : 1, i.e., the company exceeds the EU15 targets for 2010 by a factor of 2.7. In this respect, the best performing companies such as the Danish pharmaceutical company Novonordisk surpass the hurdle of the European target efficiencies by a factor of up to 3.6.

Table 4 lists the 20 companies that bring up the rear of the ranking in the ADVANCE survey's future performance scenario. Again, the table is sorted according to the RCRs. The worst performing company, the Hungarian utility MVM, uses its environmental resources more than 300 times less efficiently compared to the 2010 performance targets of the EU15. Moreover, there are numerous oil and gas companies and utilities that produce RCRs between 1 : 35 and 1 : 65, which still means that these companies have a long way to go in order to measure up to the 2010 EU target efficiencies. If we look at the absolute SV of the laggards in the ADVANCE survey we find BP and Shell with a SV of –€ 248 billion and –€ 331 billion, respectively.

The comparison of the two tables reveals that there is a rather broad range between the best and the worst performing companies' environmental performance when benchmarked against the EU15 performance targets for 2010. At the extreme, the spread between the top position and the last position in the ranking is a factor of about 1,090. This means that with respect to the EU15 performance targets for 2010, top performing Novonordisk uses its environmental resources 1,090 more efficiently than the overall laggard MVM. Even if we turn away from the absolute extreme, there is a considerable variance of 135 between the top performing companies with a RCR of about 3 : 1 and the laggards with their RCRs of 1 : 45 or less.

Table 4 Twenty worst performing companies vis-à-vis EU15 performance targets

	<i>Company</i>	<i>RCR 2003 > 2010</i>	<i>Sustainable Value 2003 > 2010 (€)</i>
46	OMV	1 : 7.9	-10,660,067,507
47	ENEL	1 : 8	-92,696,195,508
48	BP	1 : 9.1	-248,473,202,187
49	ASM	1 : 9.7	-2,823,001,775
50	Shell	1 : 9.9	-331,423,483,150
51	ENI	1 : 11.3	-130,652,388,317
52	Celanese	1 : 13.1	-13,559,572,503
53	Suez	1 : 13.6	-175,345,711,302
54	Kemira	1 : 13.8	-9,979,144,884
55	Scottish and Southern energy	1 : 14.3	-20,507,824,481
56	Repsol YPF	1 : 15.2	-102,177,853,981
57	AEM	1 : 18.1	-9,297,562,895
58	Fortum	1 : 24.7	-61,912,703,062
59	Edison	1 : 26.2	-31,542,932,659
60	Energias de Portugal	1 : 35.8	-83,343,912,554
61	ERG	1 : 44.5	-22,544,233,829
62	Slovnaft	1 : 45.1	-9,852,893,473
63	Union Fenosa	1 : 51.5	-99,263,349,894
64	Unipetrol	1 : 65.8	-15,800,783,469
65	MVM	1 : 303	-79,145,245,744

Source: The ADVANCE Project (2006)

3.2 In-depth analysis of the results

An in-depth analysis of the results reveals a number of interesting details of companies' performance vis-à-vis the EU15 performance targets. For instance, in the ADVANCE survey we identify those companies that are affected particularly hard by the EU economic and environmental performance targets. For this purpose, we compare the results of the assessment against the EU targets with the results of the past performance scenario of the ADVANCE survey where corporate performance in 2003 was benchmarked against the performance of the EU15 in the same year.

There are four companies that turn from a positive assessment in the year 2003 to a negative assessment in the light of the EU performance targets, namely Heineken, SKF, Richter and Pirelli. This means that in 2003, these companies used their environmental resources more efficiently than the EU15 on average in 2003. However, at the same time they did not use their environmental resources efficiently enough in 2003 to surpass the hurdle that is defined by the EU15 economic and environmental performance targets for the year 2010. Pirelli's RCR, for example, changes from 1.3 : 1 in 2003 to 1 : 1.3 when assessed against the 2010 performance targets. This means that Pirelli have to improve their overall eco-efficiency by about 70% in order to preserve their performance level of 2003 in the future.

As already pointed out above (see Figure 2), Pirelli's most striking weakness is their VOC performance. This does not come as a surprise. The VOC target is the most demanding efficiency target among the seven environmental resources we covered in the ADVANCE survey. The EU15 demands for an improvement of the VOC-efficiency of 111% by 2010 compared to 2003. As a consequence, companies with a poor VOC-performance are affected particularly hard by the target efficiencies. For instance, the French car manufacturer PSA Peugeot-Citroën loses more than 90% in efficiency compared to its 2003 performance when assessed against the 2010 performance targets.

Another interesting insight can be gained from taking a closer look at the performance within sectors. This can be done with two different foci. On the one hand, one can address the overall sector and analyse its vulnerability to the future performance targets. On the other hand, sector leaders can be distinguished from sector laggards with respect to the question which companies are best prepared to meet the future performance level envisaged by the EU15.

The car manufacturing sector's vulnerability to the VOC efficiency target is particularly interesting in this context. In the ADVANCE survey the following nine car European car manufacturing companies have been assessed: BMW, DaimlerChrysler, FIAT, NedCar, PSA Peugeot-Citroën, Renault, Scania, Volkswagen and Volvo. On average in 2003, these nine companies used VOC-emissions in a value-creating way and had a RCR for VOC-emissions of 1.2 : 1. This means that the car manufacturing sector yielded 1.2 times more return per ton of VOC-emissions than the EU15 in 2003 on average. Interestingly, when assessed against the 2010 performance targets of the EU15, the VOC-performance of the car sector turns from positive to negative, which is reflected by a RCR for VOC-emissions of 1 : 1.7. This means that the car manufacturing sector misses the EU15 VOC-efficiency target for 2010 – that combines the Lisbon growth target and the Gothenburg emission reduction target – by a factor of 1.7. In other words, on average the car manufacturing sector has to improve its VOC-efficiency by 70% until 2010 in order to meet the EU target. However, the results allow for a more detailed analysis. They reveal that some of the car manufacturers are already in line with or even above the EU15 target efficiency for VOC-emissions while other car manufacturers fail to meet this target. Namely, BMW and DaimlerChrysler with a future RCR for VOC-emissions of 1.9 : 1 or 1.7 : 1, respectively, already meet this target and use VOC-emissions in a value-creating way – even under the more stringent regime of the future performance targets. On the other side, PSA, Renault and Volkswagen are affected more seriously by the VOC-targets. These companies only achieve a future RCR for VOC-emissions of 1 : 3.2, 1 : 3.1 and 1 : 1.7, respectively, which means that they have to improve their VOC-performance by between 70% and 320% in order to meet the performance targets. FIAT even falls short of meeting the VOC-target by a factor of 8.9. This demonstrates that the emission of VOC is a problem that can be addressed – as demonstrated by some companies – but is not addressed across the entire sector.

Another interesting example of the performance spread within a sector can be seen among the chemicals companies we have assessed in the ADVANCE survey. None of the chemicals companies achieve positive results when assessed against the EU15 performance targets for 2010. Imperial Chemical Industries (ICI), as the leader among the chemicals companies we have analysed, achieves a future RCR of 1 : 2.3 and thus falls short of the 2010 performance targets by a factor of 2.3. However, the sector laggard, the Finnish Kemira Oyj achieves only RCR of 1 : 13.8 when assessed against the EU15 targets. This means that ICI performs six times better than Kemira in the light of the

stringent conditions of the EU targets. This indicates that despite an affiliation in a highly polluting sector there is considerable room for manoeuvre for environmental management to improve environmental performance.

4 Discussion and implications

The results of the performance assessment of 65 companies vis-à-vis the EU15 performance targets for 2010 in the ADVANCE survey offer a range of interesting implications and insights.

First of all, the ADVANCE survey demonstrates that the SV approach allows a meaningful comparison of the contributions of companies to performance and policy targets, such as the Lisbon strategy or the different European environmental protection programmes. The SV approach benchmarks the environmental performance of companies against such targets and translates corporate environmental performance into monetary terms, which are easy to understand and communicate. The results can be used to distinguish those companies that already meet the environmental and economic performance targets of the EU15 for 2010 from other companies whose performance is not (yet) in line with these targets. In addition, the results quantify by how much each company contributes or falls short of the European policy targets. For instance, the RCRs clearly indicate by how much companies have to improve to meet the EU15 performance targets. The results also indicate that company performance not only depends on sector affiliation. Rather, there are also considerable differences between companies of the same sector.

Secondly, the SV approach allows for an in-depth analysis of corporate environmental performance. The results identify areas of strengths and weaknesses in the light of the EU performance targets. This shows which environmental resources are already being used in a target-compliant and hence value-creating way. Likewise, the results indicate in which areas companies fall short of using environmental resources in line with future performance targets. The analysis thus provides clear indication and guidance for corporate environmental management in which areas specific focus for improvements should be put. This also includes an important aspect of risk management, as the results show the specific exposure and vulnerability of companies to more stringent policy regimes.

Thirdly, it is demonstrated in the ADVANCE survey that the SV approach can be used to conduct an integrated assessment of the contribution of companies to economic and environmental performance targets. The analysis thus integrates a normative aspect as it defines a hurdle for the use of environmental resources that is driven by performance targets which describe a desirable future state. In our assessment, environmental resources are only used in a value-creating way by a company if the resource use is more eco-efficient than the target efficiency defined by the European policy goals. The integrative nature of the assessment consists of two particular features of the SV approach. On the one hand, the target efficiencies combine economic performance targets – as defined e.g., by the Lisbon strategy's growth target – with environmental performance targets, such as the EU burden sharing agreement for the reduction of greenhouse gas emissions, or the NEC directive on the emission of air pollutants. The approach thus facilitates the need to integrate different policy areas. On the other hand, the SV approach allows the integration of different environmental performance

targets. It has been shown that different environmental policy areas can be included in SV assessments. Consequently and most importantly, the SV approach measures the simultaneous contribution of companies to different environmental and economic performance targets. It thus translates the integrative core mantra of sustainability into measurable and operative terms.

5 Conclusions

The ADVANCE survey represents the first study that provides an integrated monetary analysis of the contribution of companies to the achievement of EU's environmental and economic performance targets. Based on publicly available data, we have analysed to which degree 65 European companies from the manufacturing sector contribute to the achievement of the most important economic and environmental policy targets for 2010 that have been defined by the EU15 in the course of the Lisbon strategy, the Kyoto protocol, the Gothenburg protocol and the European environmental action programme. The application of the SV methodology has produced robust results indicating the companies' performance vis-à-vis the relevant EU15 policy targets.

The results show that there is a wide variance of the performance of European companies when assessed against the EU15 policy targets. Some companies already meet or even exceed the target level with their use of environmental resources. Other companies fall short of measuring up to the targeted eco-efficiency, in some cases by factors of 30 and more. Moreover, the results show by which targets the different sectors and companies are affected most. The rather large spread in the results, however, not only stems from the sector affiliation of the different companies under analysis. The results also reveal that there is a considerable variety in the performance of companies of the same sector with some companies meeting the targets and others clearly falling short. This indicates the important role and impact of environmental management, innovation and governance.

The analysis of corporate environmental performance with the SV approach provides an integrated monetary assessment that is in line with managerial thinking. At the same time, the analysis incorporates normative targets such as the reduction of emissions and pollution. In addition, it integrates different policy areas and goals from both the economic and environmental realm. The analysis thus goes beyond a one-dimensional perspective that focuses on either specific environmental or economic performance targets. Rather, it shows whether a company succeeds to contribute to the achievement of environmental and economic targets simultaneously – and helps making Europe a more competitive and environmentally sustainable place.

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