

# Sustainable Value

Putting a monetary figure on corporate sustainability performance. The case of BP.

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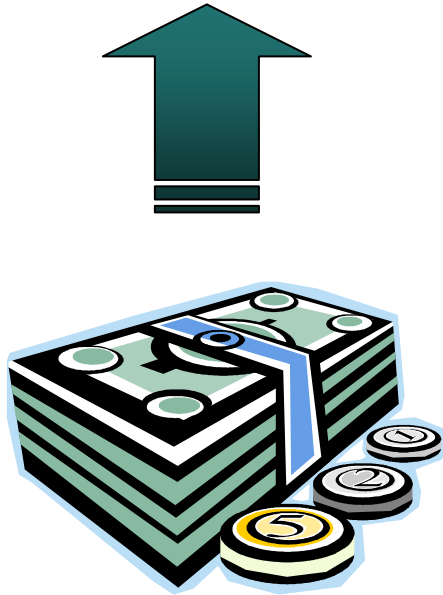
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# Value and impacts/burden/resources.

- Companies create value



More preferred to less.

- Companies need resources

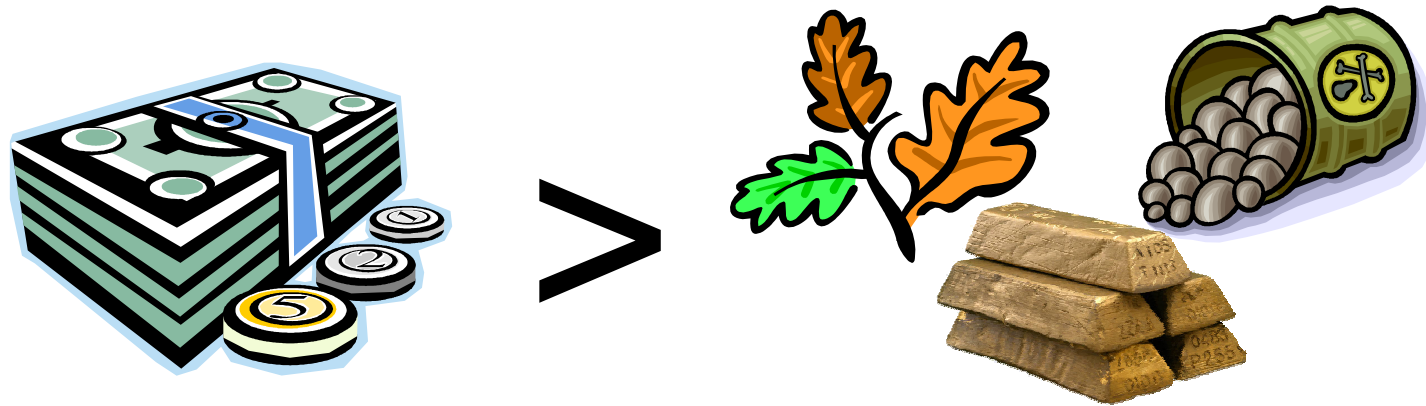


Less preferred to more.



# Dealing with the trade-off

- So, how do we know, if it is worthwhile to use a resource?



# Looking at BP's value

|                                                                  |      | \$ million     |         |
|------------------------------------------------------------------|------|----------------|---------|
|                                                                  | Note | 2001           | 2000    |
| <b>Turnover</b>                                                  |      | <b>175,389</b> | 161,826 |
| Less: Joint ventures                                             |      | <b>1,171</b>   | 13,764  |
| <b>Group turnover</b>                                            | 1    | <b>174,218</b> | 148,062 |
| Replacement cost of sales                                        |      | <b>146,893</b> | 120,720 |
| Production taxes                                                 | 2    | <b>1,689</b>   | 2,061   |
| <b>Gross profit</b>                                              |      | <b>25,636</b>  | 25,281  |
| Distribution and administration expenses                         | 3    | <b>10,918</b>  | 9,331   |
| Exploration expense                                              |      | <b>480</b>     | 599     |
|                                                                  |      | <b>14,238</b>  | 15,351  |
| Other income                                                     | 4    | <b>694</b>     | 805     |
| <b>Group replacement cost operating profit</b>                   | 5    | <b>14,932</b>  | 16,156  |
| Share of profits of joint ventures                               | 5    | <b>443</b>     | 808     |
| Share of profits of associated undertakings                      | 5    | <b>760</b>     | 792     |
| <b>Total replacement cost operating profit</b>                   | 5    | <b>16,135</b>  | 17,756  |
| Profit (loss) on sale of businesses or termination of operations | 6    | <b>(68)</b>    | 132     |
| Profit (loss) on sale of fixed assets                            | 6    | <b>603</b>     | 88      |
| <b>Replacement cost profit before interest and tax</b>           | 5    | <b>16,670</b>  | 17,976  |
| Stock holding gains (losses)                                     | 7    | <b>(1,900)</b> | 728     |
| <b>Historical cost profit before interest and tax</b>            |      | <b>14,770</b>  | 18,704  |
| Interest expense                                                 | 8    | <b>1,670</b>   | 1,770   |
| <b>Profit before taxation</b>                                    |      | <b>13,100</b>  | 16,934  |
| Taxation                                                         | 12   | <b>5,017</b>   | 4,972   |
| <b>Profit after taxation</b>                                     |      | <b>8,083</b>   | 11,962  |
| Minority shareholders' interest                                  |      | <b>73</b>      | 92      |
| <b>Profit for the year</b>                                       |      | <b>8,010</b>   | 11,870  |
| Distribution to shareholders                                     | 13   | <b>4,935</b>   | 4,625   |
| <b>Retained profit for the year</b>                              |      | <b>3,075</b>   | 7,245   |

Source: BP Annual Report 2003



# Let's look at an example

## Looking at BP's environmental burden

|                                                                                | 2002              | 2003           |
|--------------------------------------------------------------------------------|-------------------|----------------|
| <b>Environment<sup>2</sup></b>                                                 |                   |                |
| Direct carbon dioxide (CO <sub>2</sub> ) (million tonnes) <sup>4</sup>         | 76.7 <sup>5</sup> | < <b>78.5</b>  |
| Indirect carbon dioxide (CO <sub>2</sub> ) (million tonnes) <sup>4</sup>       | 11.4 <sup>5</sup> | > <b>10.4</b>  |
| Direct methane (CH <sub>4</sub> ) (million tonnes) <sup>4</sup>                | 0.27 <sup>5</sup> | > <b>0.24</b>  |
| Direct greenhouse gas (million tonnes CO <sub>2</sub> equivalent) <sup>4</sup> | 82.4 <sup>5</sup> | < <b>83.4</b>  |
| Flaring (exploration and production) (thousand tonnes of hydrocarbons)         | 1,735             | > <b>1,342</b> |
| Sulphur dioxide (SO <sub>2</sub> ) (thousand tonnes)                           | 169.2             | > <b>150.9</b> |
| Nitrogen oxides (NO <sub>x</sub> ) (thousand tonnes)                           | 242.1             | > <b>220.3</b> |
| Non-methane hydrocarbons (NMHC) (thousand tonnes)                              | 322.1             | > <b>268.8</b> |
| Number of spills (loss of primary containment)                                 | 761 <sup>5</sup>  | > <b>635</b>   |
| Volume of product spilled (thousand litres)                                    | 3,524             | < <b>3,837</b> |
| Volume of product unrecovered (thousand litres)                                | 1,084             | < <b>1,407</b> |
| Discharges to water (thousand tonnes)                                          | 125.9             | > <b>57.1</b>  |
| Hazardous waste (thousand tonnes)                                              | 302.0             | > <b>238.6</b> |
| Environmental and safety fines and penalties (\$ million)                      | 27.5              | > <b>7.0</b>   |



# Easy in theory – difficult in practice



Challenge: We need to express this in the same unit!



# Let's sum up The Burden-Oriented Approach



- Research and practice use a burden-oriented approach to assess and manage environmental and social bads.
- Weigh up different „environmental bads“
  - How bad is more CO<sub>2</sub> in comparison to all the other impacts?
  - What's e.g. the trade-off between work accidents and CO<sub>2</sub>?
- To be able to subtract «burden» from «value» we need to (in addition to the weighing up) monetarize the burden.



# The Value-Oriented Approach



- How much value is created?
  - How much € value is created per ton of CO<sub>2</sub>?
  - How much € value is created per ton of VOC?
- Compare the value of alternative uses (opportunity costs)
  - When used in another place – how much more value is created?
- It's
  - Focused on how much value is created.
  - Easy to do.
  - Using the logic of the financial markets.
  - Compatible with managerial thinking.





# How to deal with environmental damage?

## **Substituting different forms of capital**

How much do I have  
to pay you to accept  
the damage?

## **Substituting different using of capital**

How much do I have  
to pay you to pollute  
instead of you?

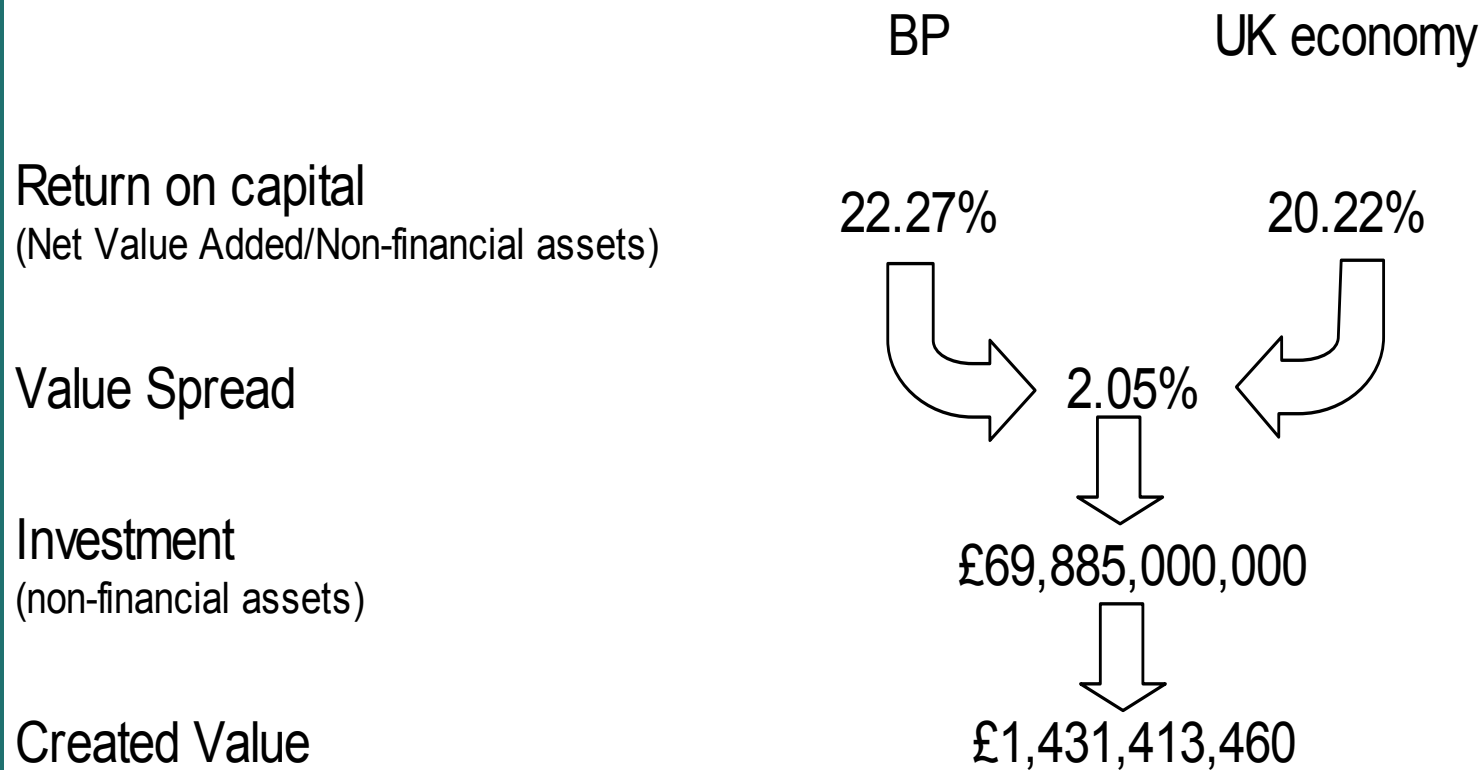


# Fundamental Differences Between Value-based and Burden-based Approaches.

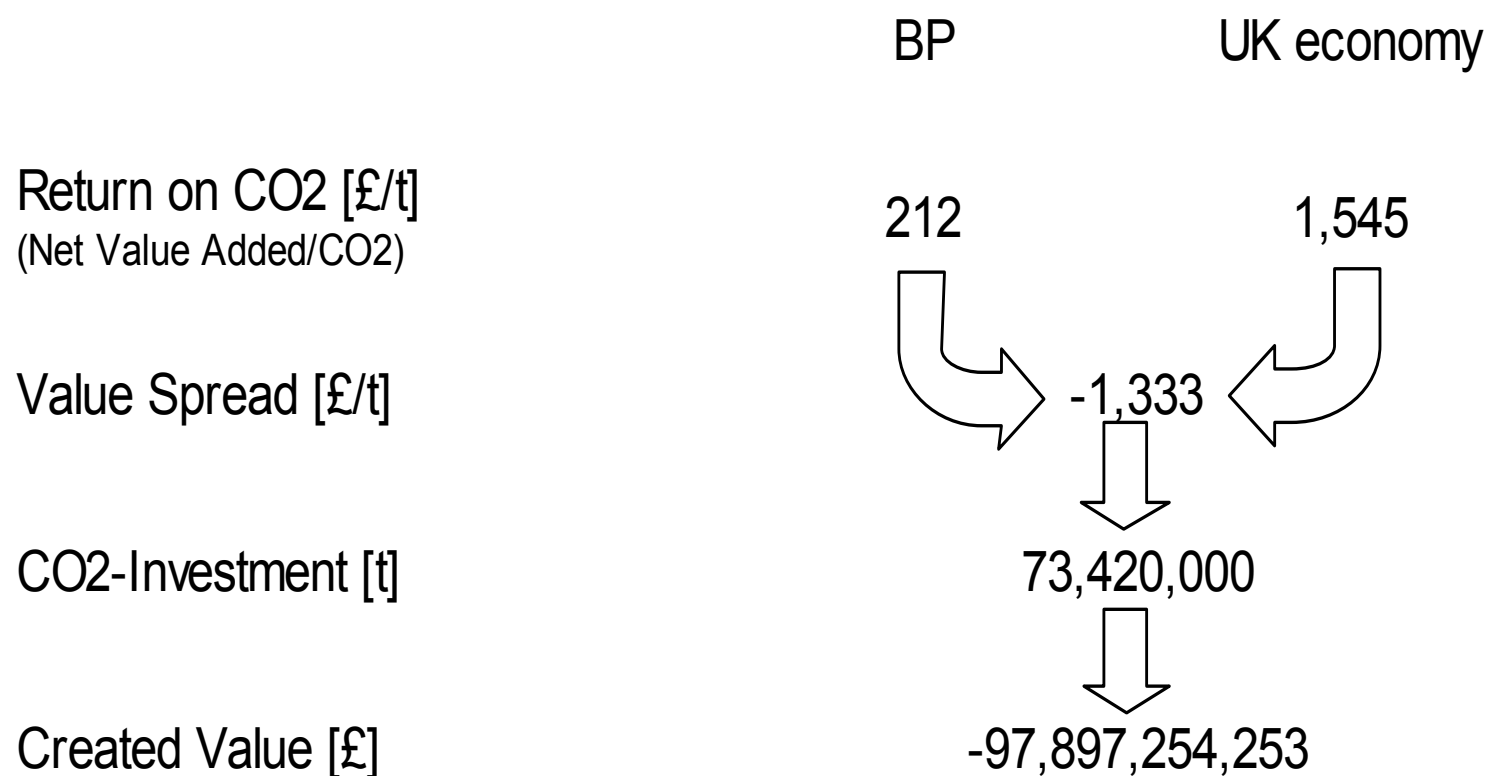
- Burden-based approaches...
  - ... assess resource use according to the burden that is caused.
  - ... focus on the relative harmfulness of environmental impacts.
- Value-based approaches...
  - ... assess the use of resources according to the effect on value creation.
  - ... focus on opportunity cost of resource use.
- Both approaches are necessary for optimal resource use.



# Let's look at it in economic terms: Creating economic value



## ... an analogous environmental perspective: Creating environmental value



# Core questions to be answered by applying the Sustainable Value concept

- A company is using a given bundle of economic, environmental and social resources.
  - Is it contributing to sustainability of the national economy, region or industry it operates in?
  - Which resources are used in a value-creating way, which are not?
  - Possible extension:  
Does the company meet reduction targets for resource use and still create Sustainable Value?



# Practical Steps to Use Sustainable Value

- Choose the economic, environmental and social resources you want to look at.
- Choose your benchmark.
- Collect data.
- Calculate Sustainable Value.
- Interpret Sustainable Value.



# Practical questions to be addressed before using Sustainable Value

- The Sustainable Value methodology requires figures
  - on the value created and
  - the burden (i.e. emissions) causedboth on a
  - corporate and a
  - benchmark level (e.g. national level).
- Figures on the corporate and the benchmark level must be consistent
  - in scope
  - in time
  - in data quality



# The Choice of the Benchmark.

- The choice of the benchmark determines the opportunity cost of the use of environmental resources in companies.
- Benchmark can differ
  - in time (past-oriented vs. future-oriented)
  - in scope (geographical, sector specific).
- The benchmark represents the level to which the use of environmental resources in companies is compared.
  - It determines the explanatory power of Sustainable Value.
  - The benchmark should be chosen with deliberation.





# The case of BP

- We assess BP's Sustainable Value in 2001.
- The UK national economy serves as a benchmark.
- We included not only environmental resources but also economic (i.e. capital) and social impacts (i.e. work accidents).



# The 5 steps of calculating Sustainable Value

1. Calculate corporate efficiency for each resource.
2. Calculate the efficiency of resource use of the benchmark (opportunity cost).
3. Calculate the value spread (1-2).
4. Multiply with the amount of resources used in the company in order to get the value contribution.
5. Calculate the Sustainable Value by summing up the value contributions and dividing by the number of resources considered.



# BP's Sustainable Value creation – the example of CO<sub>2</sub>

This is how much more (+) or less (-) BP gets out of a resource than the benchmark.

This is a resource BP uses.

This is how much value BP creates by using a resource efficiently.

CO<sub>2</sub> [t]    Amount of resources used    Efficiency of BP [£/unit]    Efficiency of UK [£/unit]    Value Contribution

73.420.000    \* (    212    -    1.545    ) =    -£97.897.254.253

This is how efficiently the benchmark uses that resource.

This is how efficiently BP uses that resource.

This is how much of that resource BP uses



# Sustainable Value of BP in 2001.

|                                        | Amount of<br>resources used | Efficiency of BP<br>[£/unit] | Efficiency of UK<br>[£/unit] | Value Contribution                                         |
|----------------------------------------|-----------------------------|------------------------------|------------------------------|------------------------------------------------------------|
| Capital [£]                            | 69.885.000.000 * (          | 0,22 -                       | 0,20 ) =                     | £1.431.413.459,96                                          |
| CO2 [t]                                | 73.420.000 * (              | 211,97 -                     | 1.545,36 ) =                 | -£97.897.254.253,28                                        |
| CH4 [t]                                | 367.201 * (                 | 42.382,78 -                  | 403.016,89 ) =               | -£132.425.206.435,02                                       |
| SO2 [t]                                | 224.541 * (                 | 69.310,28 -                  | 786.416,00 ) =               | -£161.019.635.056,00                                       |
| NOx (as NO2) [t]                       | 266.133 * (                 | 58.478,28 -                  | 526.617,86 ) =               | -£124.587.390.175,00                                       |
| CO [t]                                 | 124.584 * (                 | 124.919,73 -                 | 223.047,52 ) =               | -£12.225.152.606,08                                        |
| Work accidents [nb]                    | 83 * (                      | 187.506.024,10 -             | 6.667.254,48 ) =             | £15.009.617.878,46                                         |
| PM10 [t]                               | 16.666 * (                  | 933.817,35 -                 | 4.970.325,84 ) =             | -£67.272.450.494,38                                        |
| <b>Sustainable Value of BP in 2001</b> |                             |                              |                              | <b>-£72.373.257.210,17</b><br><b>-104.941.222.954,74 €</b> |

Sources: Baggott et al. 2003, DEFRA 2003, National Statistics 2003, Office for National Statistics 2003, own calculations.



# Conclusions

- The value-based approaches
  - express companies' sustainable resource use in € terms.
  - Sustainable Values show whether BP use their resources more sustainably or less sustainably than other UK companies respectively.  
→ Contribution of a company to national sustainable resource use
- Advantages of the approach:
  - It leaves overall environmental and social burden constant.
  - It goes beyond the narrow focus on financial issues and economic resources.
  - It is based on data which is publicly available.
  - It does not require external cost figures.
  - It provides a basis for meaningful but understandable measurement of sustainable resource use.



# Further Possible Applications.

- Use industry benchmarks instead of the national economy.
- Include emission reduction targets as well as growth targets.
- Assess and compare other economic entities instead of companies, e.g. countries or regions.
- ...



# How do we ADVANCE?

- ADVANCE is an EU-funded project to assess the sustainable performance of European industry using the Sustainable Value-approach.
- We will assess more than 50 companies until the end of this year.
- Assessment results will be published in a survey and the methodology will be published in a handbook.
- We will present the findings of our project in conferences all over Europe.
- Visit our project website for more information:  
[www.advance-project.org](http://www.advance-project.org)



# Publications

- Figge, F. & Hahn, T. (forthcoming): "The Cost of Sustainability Capital and the Creation of Sustainable Value of Companies", Journal of Industrial Ecology.
- Figge, F. & Hahn, T. (forthcoming): "Sustainable Value - Ein wertorientierter Ansatz zur Ermittlung der Nachhaltigkeitseffizienz und der nachhaltigen Wertschöpfung von Unternehmen", in: Busch, T. & Liedke, C. (Hrsg.): Materialeffizienz: Potenziale bewerten, Innovationen fördern, Beschäftigung sichern. München: ökom.
- Figge, F. & Hahn, T. (2004): "Sustainable Value Added. Measuring Corporate Contributions to Sustainability Beyond Eco-Efficiency", Ecological Economics, 48(2), 173-187.
- Figge, F. & Hahn, T. (2004): "Value-oriented impact assessment: the economics of a new approach to impact assessment", Journal of Environmental Planning and Management, 47(6), 921-941.
- Figge, F. & Hahn, T. (2004): "Sustainable Value Added - ein neues Maß des Nachhaltigkeitsbeitrags von Unternehmen am Beispiel der Henkel KGaA", Quarterly Journal of Economic Research, 73(1), 126-141.
- Figge, F. (2001): "Environmental Value Added - Ein neues Maß zur Messung der Öko-Effizienz", Zeitschrift für Angewandte Umweltforschung, 14(1-4), 184-197.





# More information

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