Corporate Sustainable Value Creation

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A few words about my affiliation

- The University of Leeds is one of UK's largest universities.
- The School of Earth & Environment is a rather young School.
- The Leeds Institute for Environmental Science and Management (LIfE) is one of the fasted growing institutes at the University.
- We have research groups on Sustainable Development, Ecological Economics, Risk and **Environment and Business.**

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What I expect from you!

I want you to:

- **Interrupt me** (if something is unclear)
- **Protest** (if you disagree)
- **Yawn** (if it's getting boring)

Most important:

- **I want you to interact with me.**

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Here's what we will discuss...

- How can companies create „Environmental/Sustainable Value" and how can it be measured?
- Much of this is based on some recent research we have done.
- You will not find any textbook that covers this topic in this way.
- I am researching this topic in cooperation with Tobias Hahn of the Institute for Futures Studies and Technology Assessment (IZT) in Berlin/Germany.

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Let‘s start with a question

- Why are companies created?

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Let‘s continue with another question

- What‘s the problem with companies from an environmental point of view?

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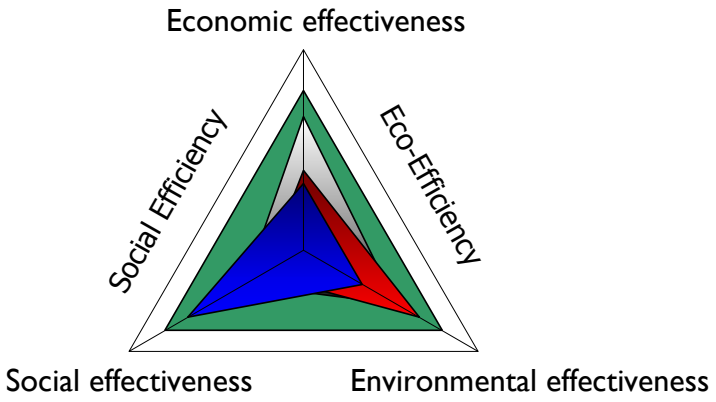
The 3 Pillar Concept



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Let‘s picture the challenge

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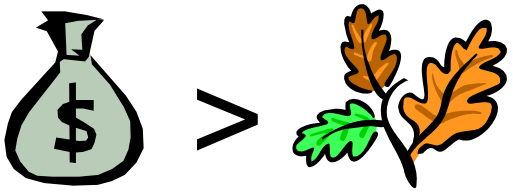
Dealing with the trade-off

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



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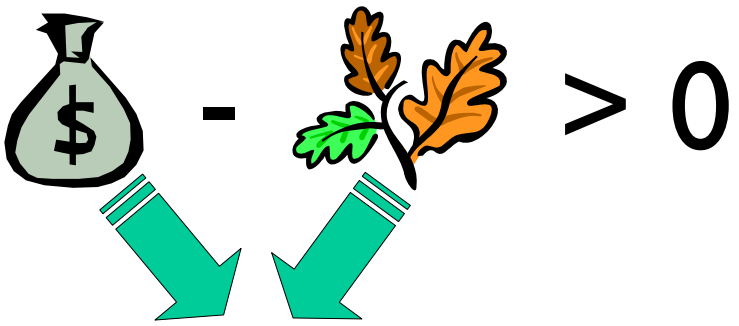
Easy in theory – difficult in practice



Challenge: We need to express this in the same unit!
➔ We will talk about how to do this later.

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Feasible in practice – limited usability

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Efficiency

- Ratio of output to input.
- In an environmental context:
  - Environmental efficiency (Freeman et al. 1973; McIntyre & Thornton 1974, 1978),
  - Ecological efficiency (Schaltegger & Sturm 1990),
  - Eco-efficiency (e.g. Schmidheiny & WBCSD 1992, WBCSD 2000).
- Efficiency considerations are important when we face scarcity.
- Environmental and social resources are limited.

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Eco-Efficiency: The big buzz-word

€

CO_2

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Let‘s talk about value...

- Companies create value for their stakeholders.
- There are different stakeholders…and different forms of value
  - Shareholders – profit/free cash flow
  - Banks – interest payments
  - Government – taxes
  - Society – value added
  - …

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Let‘s talk about resources/burdens...

- There are different kinds of resources.
- Capital
- Environmental resources
  - CO_2
  - CH_4
  - Water
  - SO_2
  - NO_x
  - VOC
  - ...
- Social resources
  - Labour
  - Work accidents
  - ...

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Let‘s talk about efficiencies...

- Return on capital
- Return on environmental resources (eco-efficiency)
- Return on social resources (social efficiency)

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Case study
Looking at BP‘s value

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

Source: BP Annual Report 2003

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Case study
Looking at BP‘s environmental burden

	1999	2000	2001	2002	2003
Environment[2]					
Direct carbon dioxide (CO_2) (million tonnes)[4]	82.8	76.6	73.4	76.7[5]	**78.5**
Indirect carbon dioxide (CO_2) (million tonnes)[4]	10.2	9.7	10.1	11.4[5]	**10.4**
Direct methane (CH_4) (million tonnes)[4]	0.45	0.33	0.34	0.27[5]	**0.24**
Direct greenhouse gas (million tonnes CO_2 equivalent)[4]	92.3	83.7	80.5	82.4[5]	**83.4**
Flaring (exploration and production) (thousand tonnes of hydrocarbons)	1,924	1,981	2,017	1,735	**1,342**
Sulphur dioxide (SO_2) (thousand tonnes)	273.0	234.7	224.5	169.2	**150.9**
Nitrogen oxides (NO_x) (thousand tonnes)	237.5	241.9	266.1	242.1	**220.3**
Non-methane hydrocarbons (NMHC) (thousand tonnes)	365.3	368.0	365.0	322.1	**268.8**
Number of spills (loss of primary containment)	1,098	958	810	761[5]	**635**
Volume of product spilled (thousand litres)	7,299	9,685	3,471	3,524	**3,837**
Volume of product unrecovered (thousand litres)	3,897	5,490	965	1,084	**1,407**
Discharges to water (thousand tonnes)	46.4	58.4	80.9	125.9	**57.1**
Hazardous waste (thousand tonnes)	196.9	161.0	241.9	302.0	**238.6**
Environmental and safety fines and penalties ($ million)	11.1	6.6	12.0	27.5	**7.0**

Source: BP Sustainability Report 2003

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Here's the problem with eco-efficiency ratios

- We can construct many different ratios based on
  - Whom value is created for
  - Which burden we want to take into account.
- There is limited management attention and an almost unlimited amount of possible (eco-)efficiency ratios.
- It is unclear how to deal with trade-offs
  - Can a good CO_2-efficiency compensate a poor SO_2-efficiency?

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The rebound effect - another problem with eco-efficiency (not in your hand-outs)

	Value [€]	CO2 [t]	CO2-Efficiency [€/t]
1998	100.00	100.00	1
1999	110.00	105.00	1.05
2000	121.00	110.25	1.10
2001	133.10	115.76	1.15
2002	146.41	121.55	1.20
2003	161.05	127.63	1.26
2004	177.16	134.01	1.32

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Here‘s my challenge to you

- Nobody in the room can tell me the eco-efficiency of
  - any economic entity (e.g. company, country, process, product),
  - however defined
  - for any year or
  - any region in the world.
- How useful is a concept that nobody seems to be able fully grasp?

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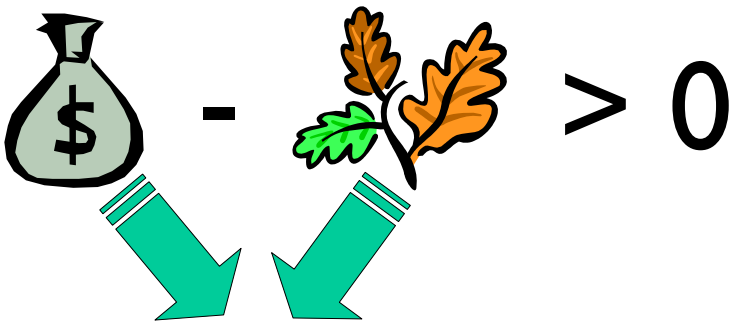
Let‘s try this next:
Easy in theory – difficult in practice



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

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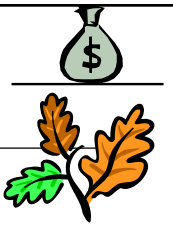
The Burden-Oriented Approach



- What‘s BP’s overall damage to society?
- Weigh up different „environmental bads“
  - How bad is more CO_2 in comparison to all the other impacts?
  - What‘s e.g. the trade-off between work accidents and CO_2?

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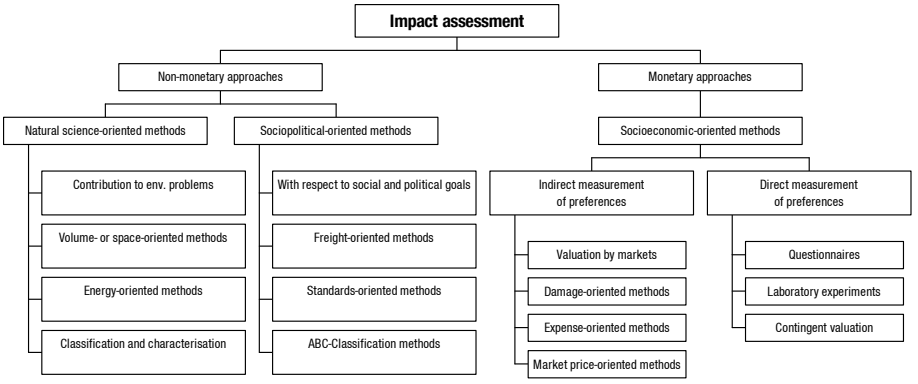
Finding the right weights.



(Source: Similar to Schaltegger/Burritt 2000)

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Let's start with 2 simple burdens
Assessing CO_2 vs CH_4

Carbon dioxide	Methane	CO2-equivalents
100	0	100
75	1	100
50	2	100
25	3	100
0	4	100

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Try this...
Assessing CO_2 vs. work accidents

Carbon dioxide	Work accidents	CO2-equivalents
100	0	100
75	1	???
50	2	???
25	3	???
0	4	???

Relative weight?

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Relative weights are not sufficient

- To be able to subtract the environmental burden from the value created the environmental burden must be monetarised.
- What's the monetary value of e.g. 1 ton of CO_2-emissions?

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The Burden-Oriented Approach

- is
  - Focused on how bad emissions and other burdens are.
  - Ethically doubtful.
  - Impossible in practice for many impacts.

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Here's what David Green had to say... ...in 1894

But, when we once recognize the sacrifice of opportunity as an element in the cost of production, we find that the principle has a very wide application. Not only time and strength, but commodities, capital, and many of the free gifts of nature, such as mineral deposits and the use of fruitful land, must be economized if we are to act reasonably. Before devoting any one of these resources to a particular use, we must consider the other uses from which it will be withheld by our action; and the most advantageous opportunity which we deliberately forego constitutes a sacrifice for which we must expect at least an equivalent return. (Green 1894)

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The Value-Oriented Approach

- How much value is created?
  - How much € value is created per ton of CO_2?
  - 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.

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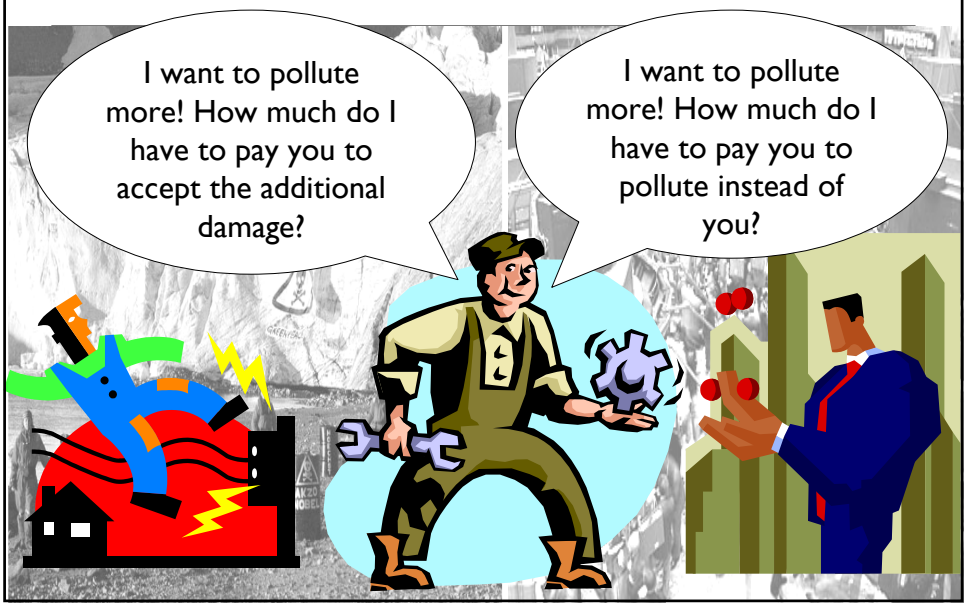
How to deal with environmental damage?



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

	BP	UK economy
Return on capital (Net Value Added/Non-financial assets)	22.27%	20.22%
Value Spread	2.05%	
Investment (non-financial assets)	£69,885,000,000	
Created Value	£1,431,413,460	

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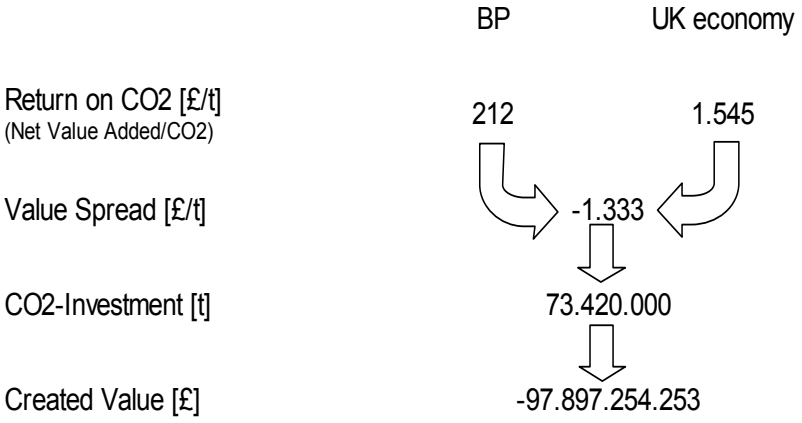
… an analogous environmental perspective: Creating environmental value



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BP's Sustainable Value in 2001 The big picture

	Return on capital [£/unit]		Opportunity cost of capital [£/unit]		Value spread [£/unit]		Amount of capital used	Value created [Mio £]
Economic capital	(0.2227	-	0.2022	) ⇨	0.0205	*	69,885 Mio £=	1,431
CO_2	(0.0002	-	0.0015	) ⇨	-0.0013	*	73,420,000 t=	-97,897
CH_4	(0.0424	-	0.4030	) ⇨	-0.3606	*	367,201 t=	-132,425
SO_2	(0.0693	-	0.7864	) ⇨	-0.7171	*	224,541 t=	-161,020
NO_X	(0.0585	-	0.5266	) ⇨	-0.4681	*	266,133 t=	-124,587
CO	(0.1249	-	0.2230	) ⇨	-0.0981	*	124,584 t=	-12,225
Work accidents	(187.5060	-	6.6673	) ⇨	180.8388	*	83 =	15,010
PM10	(0.9338	-	4.9703	) ⇨	-4.0365	*	16,666 t=	-67,272
					Sustainable Value			-72,373 Mio £

Source: Figge & Hahn 2004

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Some findings we have made

- Assessing the sustainable performance of companies is difficult.
- The main problems are linked to the aggregation of different forms of environmental and social burdens.
- The conventional approach tries to aggregate different environmental and social burdens based on “how bad” they are relative to each other (Burden-oriented approach).
- The value-oriented approach is based on how much value the use of a burden creates relative to another burden.
- Sustainable Value is created whenever resources are used more efficiently than in a benchmark.
- We can use different benchmarks (e.g. other companies, national ecomomies...)
- We can use different forms of value (e.g. value added, profit).

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Let’s wrap up for today

- Sustainable Value
  - allows to assess the sustainable performance of companies similar to financial performance.
  - is based on opportunity costs.
  - expresses corporate sustainable performance in monetary terms.
  - is based on data which is publicly available.
  - does not require external cost figures.
  - based on publicly available information we can calculate that BP creates a negative sustainable value of about 72,000 Mio £ (about 8% of British GDP).

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Suggested Readings

- Figge, F. (2001): "Environmental Value Added - Ein neues Maß zur Messung der Öko-Effizienz", Zeitschrift für Angewandte Umweltforschung, 14(1-4), 184-197.
- Figge, F. & Hahn, T. (2004): "Sustainable Value Added. Measuring Corporate Contributions to Sustainability Beyond Eco-Efficiency", Ecological Economics, 48(2), 173-187.
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- Figge, F. & Hahn, T. (2004): The Cost of Sustainable Capital. An Assessment of Sustainable Value Creation of Companies. Leeds and Berlin: University of Leeds and Institute for Futures Studies and Technology Assessment.
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More information

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