



CO2 Emissions - Strategies of large Emitters. Case Study in Austria

A Master Thesis submitted for the Degree of
“Master of Science”

Supervised by

Prof. Dr. Nebojsa Nakicenovic

Mag. Martin Eugen Wolf

7225911

Vienna, August 31st.2009

Affidavit

I, **Martin Eugen Wolf**, hereby declares

1. that I am the sole author of the present Master Thesis, 'CO2 Emissions – Strategies of Large Emitters. Case Study in Austria', <68> pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and
2. that I have not prior to this date submitted this Master Thesis as an examination paper in any form in Austria or abroad.

Vienna, 31st.August 2009

Date

Signature

A door like this has cracked open five or six times since we got up on our hind legs. It's the best possible time to be alive, when almost everything you thought you knew is wrong.

-Tom Stoppard, *Arcadia*

Truth emerges more readily from error than from confusion.

-Francis Bacon, *Novum Organum*

Abstract

How are, under the present uncertainties, Austria's large emitters defining and implementing their CO₂/Climate Change strategies was the question that raised my interest.

Based on the methodology that 'Carbon Disclosure Project' developed over the past 9 years an adapted questionnaire was designed. It served as guideline for the extensive interviews with leading top managers in Austria's large emitters. The responses have been evaluated and anonymised.

The companies have a well defined CO₂ / Climate Change Strategy and are active in its implementation. Scope 1 GHG are well monitored and effective and efficient reduction measures being implemented, for Scope 2 as well as for Scope 3 GHG the corporations will be challenged to effectively start monitoring and reducing them. Little interest is found for VER's (Voluntary Emissions Reductions).

Intensifying the dialogue and the search for a consensus with stakeholders on the further pathway to a low carbon economy is essential if we are going to get an agreement at COP15 / Copenhagen.

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1. Introduction and motivation.

“It’s about the economy, stupid.....”¹ This quote is being widely used also in today’s discussion on climate change mitigation cost and its related issues.

Through the large scale availability of energy –primarily fossil fuels- and its transformation into energy, humanity has been able over the past two centuries to see explosive population growth as well as freeing billions from a Hobbesian existence of toil, disease and hunger. Within this century we could free billions more². A very promising path being the implementation of a low carbon economy associated and paired with sustainable development concepts .It would enable the delivery of initially more sustainable energy mix (fossil and renewable), at a later stage renewable energy to the 1,6 billion of the world population which lack access to it today.

The business world’s decision making process is ruled in general by a few parameters which have not much changed over the past few thousand years, the primary one: profit with the instinctively perceived risk as gauge and since the Renaissance with evermore sophisticated risk analysis tools derived from the simple commercial bookkeeping and elementary forecasting.

Consider the information’s outlined below:

- The UNFCCC report 2007 – based on 6 commissioned studies- concluded that total funding need for adaptation by 2030 could amount to US\$49 – 171 billion per annum globally, of which \$27 – 66 billion would accrue in developing Countries. The global cost for the Chapter infrastructure was estimated at 8 to 130 US\$ billion, a 16 fold delta between the values. Some sectors such as mining and manufacturing, energy, retailing, and tourism, were not included in the UNFCCC report^{3,4}.

¹ Mantra of Bill Clinton USA Presidential Campaign of 1992, attributed to James Carville, Campaign Manager

² Beinbocker (2007), p.452

³ UNFCCC Report as quoted in Parry (2009), p.9

⁴ As equated by Parry (2009), p.11

- The UNFCCC estimate of investment needs is probably an under-estimate by a factor of between 2 and 3 for the included sectors. It could be much more if other sectors are considered⁵.
- It is not clear what proportion of expected damage would be avoided by the proposed UNFCCC investment levels⁶.

Information is scarce about the scale of future potential impacts, and is even more scant for the costs of avoiding them by adaptation; accordingly large is the uncertainty for investment decisions at corporate level.. A good example for this uncertainty is the fate of biofuels and their compulsory blending to transport fuels in the EU.

Having had 30 years of professional experience in top management jobs I was intrigued by the question how corporations are handling the uncertainties of climate change adaptation / mitigation and have they, as a result formulated a CO2 emissions strategy. To address this issue systematically a questionnaire was designed and discussed in detail with top management personalities of Austria's large CO2 emitters.

The results are anonymised and present in graphical form.

Anecdotic evidence was collected with those managers who engaged in answering the last set of questions referring to their personal views and opinions about climate change.

The basic framework within which corporate management is to make its decisions on climate change related issues will be presented. The first chapter will centre on the EU-ETS Trading Scheme and the options developing within the framework of COP15 / Copenhagen; the second chapter will provide a summary of the present economic implications of the EU ETS. Finally the results of 10 in-depth interviews with top management of large emitters will be presented.

⁵As equated by Parry (2009), p.14

⁶As equated by Parry (2009), p.12

1.1 Goal of the thesis and research questions:

- A. Do Austria's large emitters have an established CO₂ / Climate Change strategy?
- B. To which degree is it functional and communicated to the stakeholders?
- C. Are there common denominators across the different sectors / industries?

2. Assumptions and Method

2.1 Overview of Assumptions and Method

- Review of the present status in legislation (EU-ETS) and the further potential development of the climate change abatement regulations at COP15 / Copenhagen.
- Design of a questionnaire to enable systematic and comparable data collection across sectors and industries.
- Interviews with top management of large emitters in Austria.

2.2 Structure of result

- The above collected data collected will be anonymised, transformed into graphs and commented.

3. EU Emission Trading Scheme (EU ETS)

3.1 Overview

The stated purpose of an emission trading scheme is to reduce emissions and to do so at least cost via a common price of CO₂ and ability to trade. This helps affecting GHG capped sectors' competitiveness the least. The economic rationale behind emissions trading, applied to a large number of installations belonging to heterogeneous sectors, is that no source should pay more, at the margin, than another to reduce its emissions. The price of CO₂ allowances, a price to be paid on marginal emissions, ought to guide industry to conduct emission abatement measures that it would not have undertaken otherwise. The importance of the carbon price signal cannot be underestimated. It allows internalising the social cost of the pollutant and requires the emitter to optimise choices on that basis. For the consumers of pollution-intensive products, a price on GHG emissions allows demand to adjust accordingly. As prices for pollutant-intensive goods should increase, demand should decrease in favour of less polluting products or in favour of an absolute decrease in demand⁷.

The EU Emissions Trading Scheme is the world's most ambitious programme for environmental management: it is central to delivering Europe's Kyoto commitments⁸ as well as ensuring a passage to a low carbon economy.

The international political response to climate change began with the adoption of UNFCCC in June 1992, entering in force in March 1995 with now 192 parties. In December 1997 at COP3 in Kyoto the "Kyoto Protocol" was agreed to, committing developed countries and countries in transition to a market economy (Annex 1 Parties) to reduce their emissions of six GHG by an average of 5,2% below 1990 levels in the period 2008-2012 (First Commitment Period). This targets were specifically set out for each individual country.

In order to become legally binding the Kyoto Protocol needed the ratification by at least 55 countries that were also responsible for at least 55% of the Annex I countries carbon emissions in 1990. This target was achieved with the ratification by

⁷ Reinauld, (2008) Issues..., p.17

⁸ Carbon Trust (2004), CT-2004-04, p.2

Russia. The Kyoto Protocol entered into force in February 2005 and has now 182 parties.⁹

The centrepiece of European greenhouse gas mitigation policy is Directive 2003/87/EC. It establishes a Community-wide GHG emissions trading scheme that is intended to enable companies in the EU to reduce compliance costs. The 'European Emissions Trading Scheme' (EU-ETS) officially became operational in January 2005 and applies to manufacturing industry and energy supply (around 11,500 installations in the EU's 27 Member States), which together account for around half of the EU's CO₂ emissions.

Under the EU-ETS, covered facilities are issued with allowances indicating the maximum amount of CO₂ (other gases are eligible, but have to be opted in by each Member State, which has not happened yet) that can be emitted in any one year. If a company emits more CO₂ than it has allowances it can buy additional allowances on the market from companies with excess allowances, i.e. those which emitted less CO₂ than they were allowed. After each calendar year, installations must surrender a number of allowances equivalent to their verified CO₂ emissions in that year, otherwise they will have to pay a fine for each tonne over-emitted, as well as making up the deficit. During the first trading period the penalty is € 40 per tonne, but from 2008 it will rise to € 100. Operators also have to obtain allowances to make up the shortfall in the following year.

There is a maximum of 5% auctioning in the first trading period and 10% in the second, at levels set by each Member State. Otherwise allowances are issued for free, using methodologies that vary by Member State, but include both grandfathering and benchmarking.

The European Commission has set out specific legislation (2216/2004/EC) for a 'standardised and secure system of registries' to track the issuance, holding, transfer and cancellation of allowances. Installations open trading accounts in national registries, which are linked to a Europe-wide transaction log, available on the web¹⁰. The computerised system tracks all of the transactions and any irregularities detected prevent a transaction from being completed.¹¹

⁹ Point Carbon Research (2008), p. 3

¹⁰ European Commission, Community Transaction Log, http://ec.europa.eu/environment/climat/emission/citl_en.htm (last visited 22 August 2009).

¹¹ IEEP & NRDC (2008), p.36

3.2 The 2005-7 and 2008-12 trading periods¹²

The current ETS Directive is divided into two trading periods, First period in 2005-2007 and

Second Period in 2008-2012. The latter is concurrent with the Kyoto Protocol's first commitment period, where the ETS fits integrally into each Member State's and the EU's overall compliance with the burden sharing targets and the Protocol. The 2005-7 period was therefore seen as something of a trial run for the later period, and serious problems were evident.

These problems were more than just birth pains - the process of setting allocations at national level, and the subsequent results of that process, highlight the flipside of emission trading's image as being friendly to both environment and industry. In fact, allocation setting is a process fraught with technical difficulty and tough political choices, where industry holds an information asymmetry over regulators and national governments can produce projections of emissions needs using opaque methodologies, designed to protect their industries¹³. In the USA corn based bioethanol – with its very questionable CO₂e reduction potential - is receiving massive subsidies pushed through congress by the agricultural lobby. For Brazilian sugar cane based bioethanol, the EU's agricultural lobby has effectively barred the access to the EU market, in order to protect their interests.

While warnings had long been issued that allocations were too high in the first period, when verified 2005 emissions were released in 2006, the over-allocation was made plain and shocked the market, Carbon permit prices plummeted from over €15/tonne to less than €5/tonne, and by the end of the period sank to less than €1. Permit prices for the 2008-12 period had already been trading in the previous period above €12, and through the first months of the new period rose quickly to stand at €25 by mid April 2008.

The strong price for the new period reflects the way lessons were taken from the over- allocation in the first period. To start with, having verified data in hand, it was no longer necessary to speculate about historic emissions of covered facilities.

¹² IEEP & NRDC (2008), p.37

¹³ IEEP & NRDC (2008), p.38

Nevertheless, in their 2008-12 National Allocation Plans (NAP), many Member States still gave generous allocations, often claiming the need to allow for strong activity growth.

The Commission, however, approved all but four NAP's under the condition that total allocation levels were cut – the total cuts demanded by the Commission amounted to 10.5 % below what was requested. Perhaps most remarkable is the position of new Member States: for example, Latvia, Lithuania, Malta, and Slovakia collectively proposed caps that were fully 87% above 2005 verified emissions. The Commission cut these proposals back to a rise of 23%.

Table 1: NAP-2 proposals as proposed, and as accepted, compared to NAP-1 caps and 2005 emissions (in Mt CO₂)

<i>Member State</i>	<i>1st period cap</i>	<i>2005 verified emissions</i>	<i>Proposed cap 2008-2012</i>	<i>Cap allowed 2008-2012 (in relation to proposed)</i>	<i>Additional emissions in 2008-2012</i>	<i>JI/CDM limit 2008-2012 in %</i>
Austria	33.0	33.4	32.8	30.7 (93.6%)	0.35	10
Belgium	62.1	55.58	63.3	58.5 (92.4%)	5.0	8.4
Bulgaria	42.3	40.6 ¹	67.6	42.3 (62.6%)	n.a.	12.55
Cyprus	5.7	5.1	7.12	5.48 (77%)	n.a.	10
Czech Rep.	97.6	82.5	101.9	86.8 (85.2%)	n.a.	10
Denmark	33.5	26.5	24.5	24.5 (100%)	0	17.01
Estonia	19	12.62	24.38	12.72 (52.2%)	0.31	0
Finland	45.5	33.1	39.6	37.6 (94.8%)	0.4	10
France	156.5	131.3	132.8	132.8 (100%)	5.1	13.5
<i>Germany</i>	<i>499</i>	<i>474</i>	<i>482</i>	<i>453.1 (94%)</i>	<i>11.0</i>	<i>20</i>
Greece	74.4	71.3	75.5	69.1 (91.5%)	n.a.	9
Hungary	31.3	26.0	30.7	26.9 (87.6%)	1.43	10
Ireland	22.3	22.4	22.6	22.3 (98.6%)	n.a.	10
Italy	223.1	225.5	209	195.8 (93.7%)	n.k.	14.99
Latvia	4.6	2.9	7.7	3.43 (44.5%)	n.a.	10
Lithuania	12.3	6.6	16.6	8.8 (53%)	0.05	20

<i>Member State</i>	<i>1st period cap</i>	<i>2005 verified emissions</i>	<i>Proposed cap 2008-2012</i>	<i>Cap allowed 2008-2012 (in relation to proposed)</i>	<i>Additional emissions in 2008-2012</i>	<i>JI/CDM limit 2008-2012 in %</i>
Luxembourg	3.4	2.6	3.95	2.5 (63%)	n.a.	10
Malta	2.9	1.98	2.96	2.1 (71%)	n.a.	Tbd
Netherlands	95.3	80.35	90.4	85.8 (94.9%)	4.0	10
Poland	239.1	203.1	284.6	208.5 (73.3%)	6.3	10
Portugal	38.9	36.4	35.9	34.8 (96.9%)	0.77	10
Romania	74.8	70.8	95.7	75.9 (79.3%)	n.a.	10
Slovakia	30.5	25.2	41.3	30.9 (74.8%)	1.7	7
Slovenia	8.8	8.7	8.3	8.3 (100%)	n.a.	15.76
Spain	174.4	182.9	152.7	152.3 (99.7%)	6.7 ^L	ca. 20
Sweden	22.9	19.3	25.2	22.8 (90.5%)	2.0	10
UK	245.3	242.4	246.2	246.2 (100%)	9.5	8
SUM	2.298.5	2.122.16	2.325.34	2.080.93 (89.5%)	54.61	-

Source: European Commission, 2007¹⁴

Reaction to these cuts by the Commission has by and large been positive, particularly by carbon traders and environmentalists. Some governments, however, fought with their own industry and with the Commission over the figures.

It remains to be seen whether second period allocations will be low enough to spur innovation and emission reduction effort, which most people agree has not been the case in the first period¹⁵.

In the course of the present massive global economic downturn (e.g. Steel Production EU27 first seven months 2009 minus 42% on 2008 level¹⁶; EU Industrial Output April 2009 minus 19,3% on previous year¹⁷, Power Production in Slovakia¹⁸ and

¹⁴ Emissions trading: EU-wide cap for 2008-2012 set at 2.08 billion allowances after assessment of national plans for Bulgaria – 26.10.2007

<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1614&format=HTML&aged=1&lan>
(Last accessed on 22 August 2009)

¹⁵ IEEP & NRDC, 2008, p.38

¹⁶ Point Carbon News, 20.08.09; <http://www.pointcarbon.com/news/>

¹⁷ Point Carbon News, 12.08.09; <http://www.pointcarbon.com/news/1.1186857>

¹⁸ Point Carbon News, 22.08.09; <http://www.pointcarbon.com/news/>

Czech¹⁹ Republic minus 11% and minus 5,5% for 1.Halfyear 2009) the prices for Carbon (EUA/OTC) have seen wide swings with a high at the End of the 2nd.Quarter 2008 close to €31/Mto CO2e, hitting a low in the Mid 1st.Quarter 2009 at €8/Mto CO2e and recuperating back to €15/Mto CO2e End of August 2009²⁰. The price volatility of Carbon will remain high as over-allocation for the years 2008 and 2009 are a fact as well as due to the uncertainties of the future economic development and the results of the COP 15 / Copenhagen.

¹⁹ Point Carbon News, 12.08.09; <http://www.pointcarbon.com/news/>

²⁰ Point Carbon News, 12.08.09; <http://www.pointcarbon.com/news/historicprices>

3.3 Post Kyoto / >2013

The post-2012 process, with the aim to define an international agreement that will succeed the Kyoto Protocol, started with two tracks of negotiations 2005 in Montreal.

The Kyoto Track, focusing on reduction targets for Annex 1 countries, is regarded as the key issue by developing countries, as they expect the reduction cuts to come primarily from developed countries. The Convention Track originally designed to engage the USA and Australia in a non-binding dialogue under the UNFCCC, was transformed in December 2007 in Bali to open continuous negotiations towards a post-2012 agreement. This is now referred to under the acronym “AWG-LCA” – Ad-Hoc Working Group on Long Term Cooperative Action under the Convention -, the main negotiation track. At COP 13 and COP/MOP 3 the “Bali Road Map” was agreed upon to finalize a post-2012 regime at COP 15 in December 2009 in Copenhagen. Three major alliances with its key players will be shaping the conference, the “European Union & Friends” with Germany, United Kingdom, France and Sweden, the “Umbrella Group” with USA, Canada, Australia, Japan, and Russia, and the “G77 Group” with China, India, and Brazil.²¹

Significant changes to the possible scenarios developed as recently as 2008 have taken place with the change of governments in USA (e.g. Waxman-Markey Bill June 2009 and US Submission to the AWG-LCA in May 2009) and Australia, as well as constructive approaches being presented by Japan, and China (e.g. China submission to AWG-LCA in April 2009) . The process covers many variables and there are numerous possible outcomes.²² One being that there will be a new agreement with quantified emission targets for Annex 1 countries and some new countries (in some way or another possibly the majority of the Umbrella Group). A milestone for this development being the signing into law of the US Waxman-Markey proposal, prior to the Copenhagen Conference.

The added value of such an international deal can be summarized in 5 points.

²¹ Point Carbon Research, (2008), pp.2-4

²² Point Carbon Research, (2009), pp. 2-3

First, several countries have announced that their targets will be tighter in case of an international agreement. EU from -20% to -30% on 1990 levels in 2020, Australia has linked its own targets (-5% up to -25% on 2000 levels) to an international target on atmospheric CO₂ concentration (e.g. 450 ppm = -25%; 550 ppm = -15%), Japan has ventilated a series of proposals that would reduce its GHG emissions in line with the USA (-20% on 2005 level by 2020 or approximately -7% on 1990 levels) and Canada.

Second, it is presumed that a multilateral agreement is more efficient than a bilateral system, as it reduces the emission reduction cost as more parties are involved and leakage is better understood and controlled.

Third, a global GHG credit generation system in developing countries (e.g. CDM, sector approaches, REDD) is easier to coordinate through one global deal than through a number of bilateral deals.

Fourth, the pressure on developing countries and the advanced developing countries in particular will be stronger bringing them closer to taking on reduction targets.

Fifth, a global deal can be expected to set the agenda worldwide and contribute to create the political momentum needed to mitigate climate change.²³

²³Point Carbon Research, (2009), pp.4

3.4 Policy uncertainty

In view of the existing time constraints the outcome of COP15 / Copenhagen could be only a political agreement on targets, possibly a definition of the overall regulatory framework and hopefully a timeline for final negotiations. The legal texts could be concluded by mid 2010. The conclusion of an operative new agreement cannot be expected any earlier than end 2011. The ratification procedures are very diverse for each party and take very long. Consequently there will barely be enough time to ratify the agreement by enough parties before the end of the compliance period (2013) of the Kyoto Protocol.²⁴

For the private players in the market, the post-2012 era represent new opportunities and risks.

Guess is that much of the risk will move from the international level to that of national regulations and bilateral agreements.²⁵ This opens for them the possibility of a more focussed and effective lobbying. The economic crisis adds another element of uncertainty as legislators are being pressured to reduce investments in Climate Change²⁶ or other politicians see in it an opportunity for a big leap forward in sustainability and climate protection²⁷.

²⁴ Point Carbon Research, (2009), pp. 4-5

²⁵ Point Carbon Research, (2009), p.11

²⁶ „Druck auf EU-Umweltausschuss: Finanzkrise gefährdet Klimaschutz“, Financial Times Deutschland 05.10.2008 <http://www.ftd.de/politik/europa/Druck-auf-EU-Umweltausschuss-Finanzkrise-gef%C4hrdet-Klimaschutz/422252.html> (accessed on 23.08.09)

²⁷ „Finanzkrise als Klimaschützer“ Financial Times Deutschland 09.10.2008 <http://www.ftd.de/politik/deutschland/CO2-Debatte-Finanzkrise-als-Klimasch%C3%9Ctzer/423878.html> (accessed on 09.10.08)

3.5 Other Emission Trading Schemes & Initiatives

A large future emission trading scheme, comparable to some degree to the EU-ETS, will emerge from the implementation of the Waxman-Markey Bill creating a carbon market that could be worth US\$ 60 billion in 2012 according to the report published by the Congressional Budget Office in Washington on June 5th.2009²⁸.

The American Clean Energy and Security Act of 2009 would make a number of changes in energy and environmental policies largely aimed at reducing emissions of gases that contribute to global warming. The bill would limit or cap the quantity of certain greenhouse gases (GHGs) emitted from facilities that generate electricity and from other industrial activities over the 2012-2050 period. The Environmental Protection Agency (EPA) would establish two separate regulatory initiatives known as cap-and-trade programs—one covering emissions of most types of GHGs and one covering hydrofluorocarbons (HFCs). EPA would issue allowances to emit those gases under the cap-and-trade programs. Some of those allowances would be auctioned by the federal government, and the remainder would be distributed at no charge.²⁹ The CBO estimated 7.400 facilities would be affected by the scheme and the programme would cover about 72% of US emissions of GHGs in 2012 and about 78% in 2015, reaching 86% in 2020³⁰. Starting in 2011, allowances would rise from US\$15 in value to US\$26 in 2019³¹.

This Trading schemes volume would significantly grow as Mexico and Canada have agreed with the USA to cooperate and participate in the event of its implementation³².

In Australia the Labour Government present a cap and trade scheme “Carbon Pollution Reduction Scheme-CPRS” with a potential volume of 80 Million CER per year, that was defeated in Parliament on August 23rd.2009; however the government intents to reintroduce the bill in November 2009 prior to the Copenhagen

²⁸ Point Carbon News, 08.06.09; <http://www.pointcarbon.com/news/1.1134273> (accessed on 10.08.09)

²⁹ H.R.2454 (2009); p.1

<http://www.cbo.gov/ftpdocs/102xx/doc10262/hr2454.pdf> (accessed on 23.08.09)

³⁰ Point Carbon News, 08.06.09; <http://www.pointcarbon.com/news/1.1134273> (accessed on 10.08.09)

³¹ H.R.2454, (2009); p.13

³² Point Carbon News,10.08.09; <http://www.pointcarbon.com/news/1.1184957> (accessed on 23.08.09)

Conference³³. The Liberal opposition prefers a baseline-and-credit model. Noted on the positive side Australia's parliament passed a bill that will require generating 20% - currently 8%- of electricity from renewable resources by 2020³⁴.

³³Point Carbon (2009), p.3

http://www.pointcarbon.com/polopoly_fs/1.1188221!CMANZ20090814.pdf (accessed on 23.08.09)

³⁴ Point Carbon News, 20.08.09; <http://www.pointcarbon.com/news/1.1195137> (accessed on 23.08.09)

4. EU ETS Economical implications

4.1 Remaining Competitive. Macroeconomic view

The shift to a low carbon economy means a mayor shifting in the business environment.

Global warming mitigation and adaptation processes spawn new regulations, technological remedies, and shifts in consumer behaviour, which will in turn have an effect on the valuations of many sectors and companies likely to be profound. Yet executives have paid so far scant attention, either because they don't understand the effects of climate change on their business or they believe them to be too uncertain or distant to model.³⁵ For companies in the power sector and energy-intensive industries, heightened greenhouse gas regulation means a shift in the global business environment on the same order of magnitude as the one launched by the oil crisis of the 1970s or wireless telephony on the telecommunications sector in the 1990's. It has a fundamental impact on the key issues of business strategy, such as production economics, cost competitiveness, investment decisions, and the value of different types of assets. Companies specifically in these sectors must take up the initiative and strive to participate in regulation of different types of GHG regulations and position themselves accordingly³⁶. An additional factor is the very large increases in the costs and price volatility of raw materials and energy as witnessed until mid 2008 followed by the financial crisis and the resulting lack of (affordable) credit lines. The combination of this two issues (raw material pricing, scarce and expensive credit lines) have shattered the foundations of the industries prepared alternative business plans for moving to new manufacturing locations outside the EU for the sole reason of GHG regulations. Many of this projects do not anymore reach the corporations demanded rate of return.

We can consider three main factors determining a sector's inherent potential exposure to the EU ETS³⁷:

³⁵ McKinsey on Finance (2008), p.1

³⁶ McKinsey Quarterly, (2007), p.45

³⁷ The Carbon Trust, (2004), p.6

Energy intensity: The sectors with high energy intensity will see their input cost rise, some of them with a very limited possibility to reduce CO₂ emissions as these are basically driven by the chemistry in their industrial process (e.g. cement or refractories). Industries and services with a low to medium energy intensity will be able to offset the increased costs of electricity by energy efficiency measures.

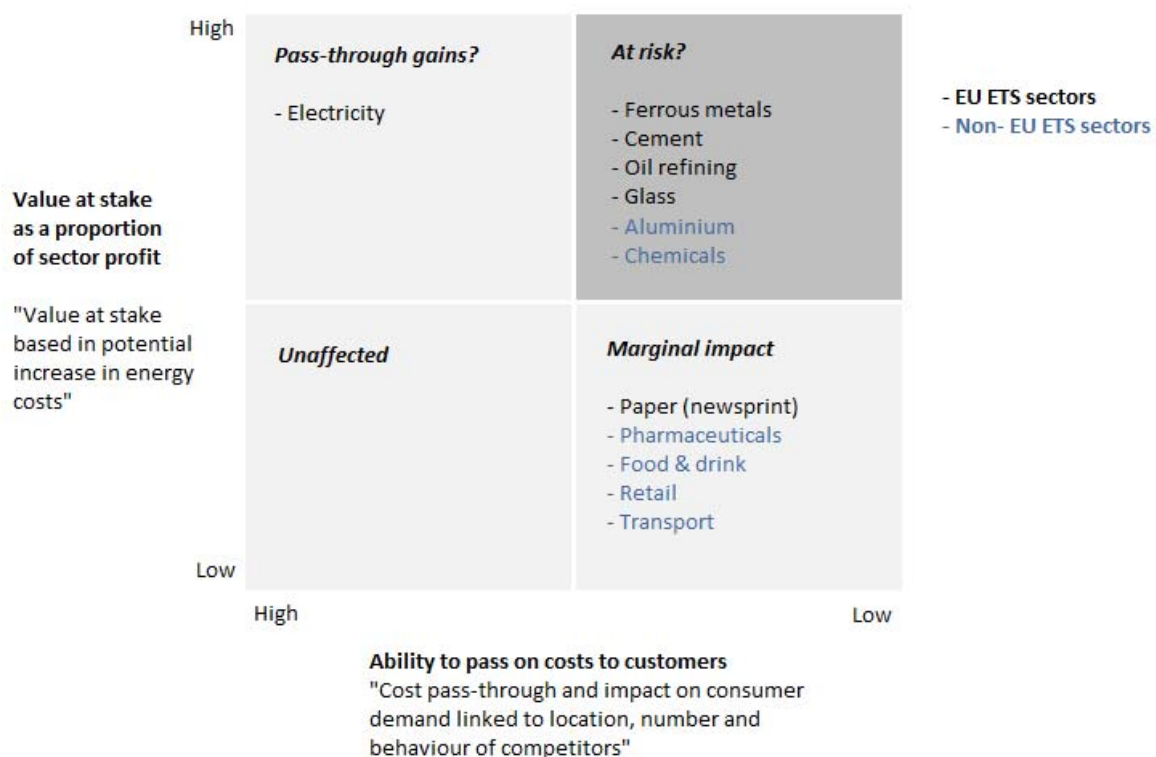
Cost-pass-through: The ability to pass cost increases through to prices depends on three main factors: first the price-responsiveness of demand; the lower this factor the lesser the effect on the sales volume. Second is the nature of competition with market structure influencing the pricing dynamics, driven both by the numbers of players in the market and the state involvement either through regulation or direct ownership. Third is the geography of the sectors market, as companies outside the EU ETS are by in general not bound to cost increases resulting from CO₂ abatement measures. Even within the EU, widely diverging situations and different approaches to the EU ETS provide some players in some countries with competitive advantages, however short lived they might be. International competition from outside the EU is of utmost importance. Players in globally traded commodity markets have far less scope to offset their exposure to the scheme through price rises.

Opportunity to abate carbon: With CO₂ emissions gaining a market price, investment in abatement e.g. energy efficiency, represents a means to both limit exposure to the EU ETS and benefit from cost savings associated with abatement activity.

An overview can be gained by classifying various sectors according to two primary dimensions of competitive exposure: potential value at stake as indicated by energy intensity, and ability to pass cost changes through into prices³⁸

³⁸ The Carbon Trust, (2004), p.7

Classification of industrial sectors according to exposure.



Source: EU ETS Industrial Competitiveness CT 2004

Figure 1: Classification of Industrial Sectors according to exposure

The stress that climate change will place on the cash flows of large public companies can be significant. Assessing the impact of a series of carbon mitigations scenarios for different industries, the change in cash flows compared with business-as-usual scenario indicates how much pressure efforts to reduce carbon emissions will exert on valuations and how much volatility a sectors current business system will face³⁹. Very energy intensive industries –e.g. aluminium - will have to cope with changes due to direct effects, indirect effects and changes in demand. In the long term the advantages enjoyed by non EU-ETS or other carbon pricing mechanism countries/producers will disappear as carbon costs will reach a global standardization⁴⁰. Question remains if within the EU-ETS we will still have energy intensive industries e.g. steel or cement with its corresponding jobs, as the long term

³⁹ McKinsey on Finance, (2008), p.1

⁴⁰ McKinsey on Finance, (2008), p.6

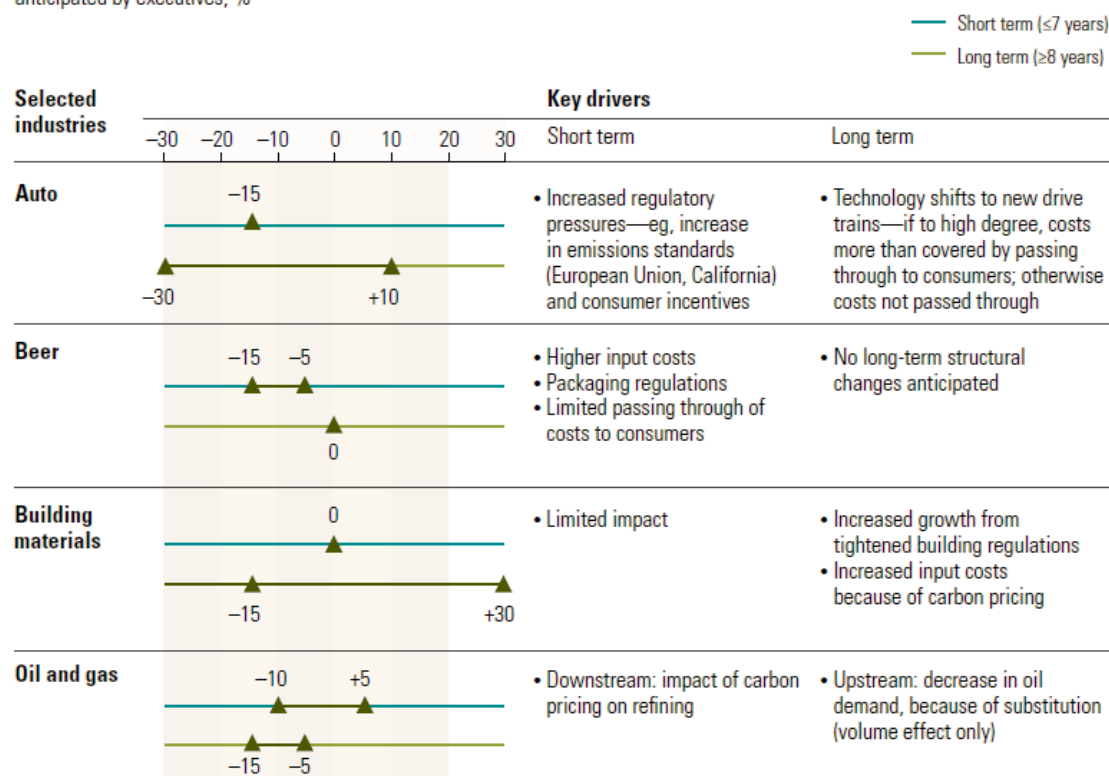
could be substantially to far away. The differences between industries are substantial as the “executive scenario” for some selected industries shows.

Exhibit 1

Opportunity or threat?

Climate change will have a major effect on shareholder value in many, but not all, sectors.

Potential impact on industry valuation of carbon-abatement measures, given level of changes currently anticipated by executives, %



Quelle: McKinsey on Finance, Autumn 2008

Figure 2: Climate Change - Effect on Shareholder Value

By in general company target setting is motivated by market forces, not by scientific requirements. This is also applicable to the reduction of CO2e / GHG and issues related to Climate Change. In order to be able to achieve a CO2e emissions reduction of 80% by 2050 –in line with the IPCC recommendations⁴¹ - GHG emissions should see a minimum annual global reduction rate of 3,9% . Results as reported by

⁴¹ IPCC Fourth Assessment Report, 2007

the Global 100 Companies show a reduction rate of only 1,9% per annum moving the 80% target towards the end of the 21st.Century⁴².

⁴² The Carbon Chasm, (2009), p.11

4.2 Remaining Competitive. Carbon Leakage

The IPCC defines carbon leakage as —the increase in CO₂ emissions outside the countries taking domestic mitigation action divided by the reduction in the emissions of these countries.

At a sector level, carbon leakage is relatively easily defined – under the condition that sector boundaries are similar in all countries, which is not yet the case for the iron and steel sector for example (IEA, 2007). Carbon leakage is the ratio of emissions increase from a specific sector outside the country (as a result of a policy affecting that sector in the country) over the emission reductions in the sector (again, as a result of the environmental policy). For so long as emissions are displaced as a result of the asymmetric climate policy, this is defined as carbon leakage.

Analysis of carbon leakage potentials requires looking at sectors from a country or region (i.e. the European Union) and the implications of the carbon mitigation policy on the competitive position of the domestic sector vis-à-vis its competitors in the rest of the world. At the centre of the analysis, is the question of the counterfactual scenario: how would the sector have evolved globally in the absence of climate policy in the region? In the modelling exercises, the baseline includes the effects of technology developments and improvements in energy efficiency that can be expected on the basis of government policies already enacted within a specific sector but also in others (IEA, 2007). It also includes assumptions on other elements in the economy (e.g. exchange rates, prices of energy, etc.)⁴³.

There are several channels of sector-led carbon leakage initiated by uneven carbon constraints, the three most important include: *A*) the short-term competitiveness channel, where carbon-constrained industrial products lose international market shares to the benefit of unconstrained competitors; *B*) the investment channel, where differences in returns on capital associated with unilateral mitigation action provide incentives for firms to relocate capital to countries with less stringent climate policies; and *C*) the fossil fuel price channel, where reduction in global energy prices

⁴³ Reinaud (2008), Issues...,p.28

due to reduced energy demand in climate-constrained countries triggers higher energy demand and CO₂ emissions elsewhere, all things being equal⁴⁴.

The sectors subject to loss of competitiveness under uneven carbon constraints and potentially to carbon leakage are internationally trade-exposed, GHG-intensive industries.

These industrial activities would support a high mitigation cost and can see their products' market challenged by foreign competitors as a result of stringent emission objectives. The inclusion of intra-sectoral discrepancies shows different leakage rates within these sectors. The general notion that a cap in a country or region will result in even more emissions globally is contradicted by all quantitative studies⁴⁵. Higher leakage rates would be expected in the steel and primary aluminium sectors than in the cement or electricity sectors – mainly because the latter are much less traded⁴⁶. A standard procedure for a given sector is to analyse two indicators: the estimated profit margins and the trade flow.

By differentiating the concept of trade intensity into a “historic” and a “Expected/Future” trade intensity results for the electric sectors remain almost unchanged – as the limiting factor is the transmission capacity, where a substantial increase is tied to a massive investment (e.g. earth-cables) into the grid and very long lead-times – however the cement / clinker industry changes dramatically.

Based on the expected cost of production in the EU assuming the carbon cost of CO₂ versus the cost of producing in non-ETS countries, clinker and cement production in the EU is not competitive without free allowances allocation. As a result, the “wise businessman” will prefer to relocate production to more competitive countries, this leading to production off-shoring. At CO₂ prices above €35/t (EU forecast €34-€39/t for the 2013-2020 period) the current proposal of the Directive will lead to the complete off-shoring of the cement industry. At CO₂ price of €25/t (June-September 2008 average price €25/t), more than 80% of EU clinker production will be at risk of off-shoring by 2020: 100% of the Italian, Greek, Polish and UK production, almost

⁴⁴ Reinaud (2008), Issues..., p.3

⁴⁵ As an example see Reinaud, Julia, Climate Policy and Carbon Leakage. Impacts of the European Trading Scheme on Aluminium, IEA, October 2008

⁴⁶ Reinaud (2008), Issues..., p.3

100% of Spanish, ~75% of German and 65% of the French and ~70% of the production of the smaller EU producers⁴⁷.

Modelling the impacts of an ETS with a carbon tax may be misleading, especially if the ETS regime provides gratis allowances to installations. In addition, under a free allocation scenario based on an absolute cap, free allowances are valued at their opportunity cost, and hence overestimate the negative impacts on companies' profit margins⁴⁸.

The cost pass-through capacity of a sector is its ability to recover the cost of the carbon constraint on product prices, without significantly undermining international competitiveness, i.e. without inducing carbon leakage. As such, it is an indicator of the carbon leakage exposure of a sector and is at the centre of discussions on how to deal with trade-exposed sectors under domestic and international climate policies. A change in international trade flows is a short term indicator, a change in investment patterns can be regarded as a long term indicator for carbon leakage.

The study of the impacts of the EU ETS on competitiveness is, and will remain plagued by the difficulty to establish the counterfactual, *i.e.*, what would have happened in the absence of a CO₂ cost: how does one detect, in the rapid industrial production growth outside the EU, the actual effect of an ambitious climate policy in the EU? While decisions to close and re-open an existing installation (smelter, kiln, furnace, etc) may be relatively quick, investment in new capacity takes years to finalise. Any impact on locating new capacity outside the EU, at the expense of existing EU capacity, may require more time to materialise. A constant monitoring of trade flows is necessary to watch how the situation evolves⁴⁹.

The proposed revision of the current EU-ETS Directive lists several measures aimed to mitigate carbon leakage. The first is continued free allocation. For those sectors or sub-sectors where there is a risk of carbon leakage, and where electricity constitutes a high proportion of production costs, the level of free allocation “may take into account the electricity consumption in the production process”, hence compensating electricity-intensive sectors from CO₂-driven electricity cost increases. Having a

⁴⁷ Boston Consulting Group, (2008), p.2

⁴⁸ Reinaud (2008), Issues..., p.4

⁴⁹ Reinaud, (2008), Climate..., p.4

clear idea of the role CO₂ prices play in electricity contracts will be critical before considering compensating for increases in indirect CO₂ costs.

The second is a “carbon equalisation system” for imports: “imported products would be included into the EU in the Community Scheme” (EC, 2008). To the extent these trade measures are put forward for to restore a sector’s competitiveness to its level without a carbon constraint, the extent to which they are still conducive to GHG emissions reductions world-wide will be critical.

Provided that such measures would be compatible with the WTO, many technical questions remain; what products will be included (semi-finished and/or finished)?

How would import-related emissions be measured and verified? Would the supply of allowances for such carbon adjustment come from the EU allowance market, or from a separate pool of allowances, or other Kyoto mechanisms?

To conclude, if sectoral carbon leakage is deemed politically relevant, robust indicators (not just simulations) are needed⁵⁰.

⁵⁰Reinaud, (2008), *Climate...*, p.5

4.3 Remaining Competitive. The case of Germany

A more detailed understanding of the overall implications for the Austrian economy can be gained by asserting the potential changes resulting from the implementation of EU ETS with its largest trading partner Germany (43% of imports and 32% of exports). Furthermore the Austrian economy has a relative large degree of similarities with the German economy, except in the electric power generation. Here the Austrian mix is different (no nuclear generators, almost no coal plants, larger degree of hydropower – peak and base load).

In September 2008 the German Federal Environment Agency published a comprehensive report⁵¹ prepared by 3 leading research institutions⁵² on the expected impacts of the EU-ETS for Germany.

The analysis was based on the direct and indirect cost effects for those sectors in Germany that may potentially be exposed to distortion in competitiveness. The analysis is based on the concept of ‘value at stake’ which has previously been applied to UK industrial sectors. The maximum value at stake is defined as the sum of potential direct and indirect costs in relation to the gross value added (GVA) of a given industrial sector. Throughout the analysis, an average EU allowance price of 20 Euro per tonne CO₂ was assumed.

The analysis for 2005 shows that for most industrial sectors covered by the EU Emissions

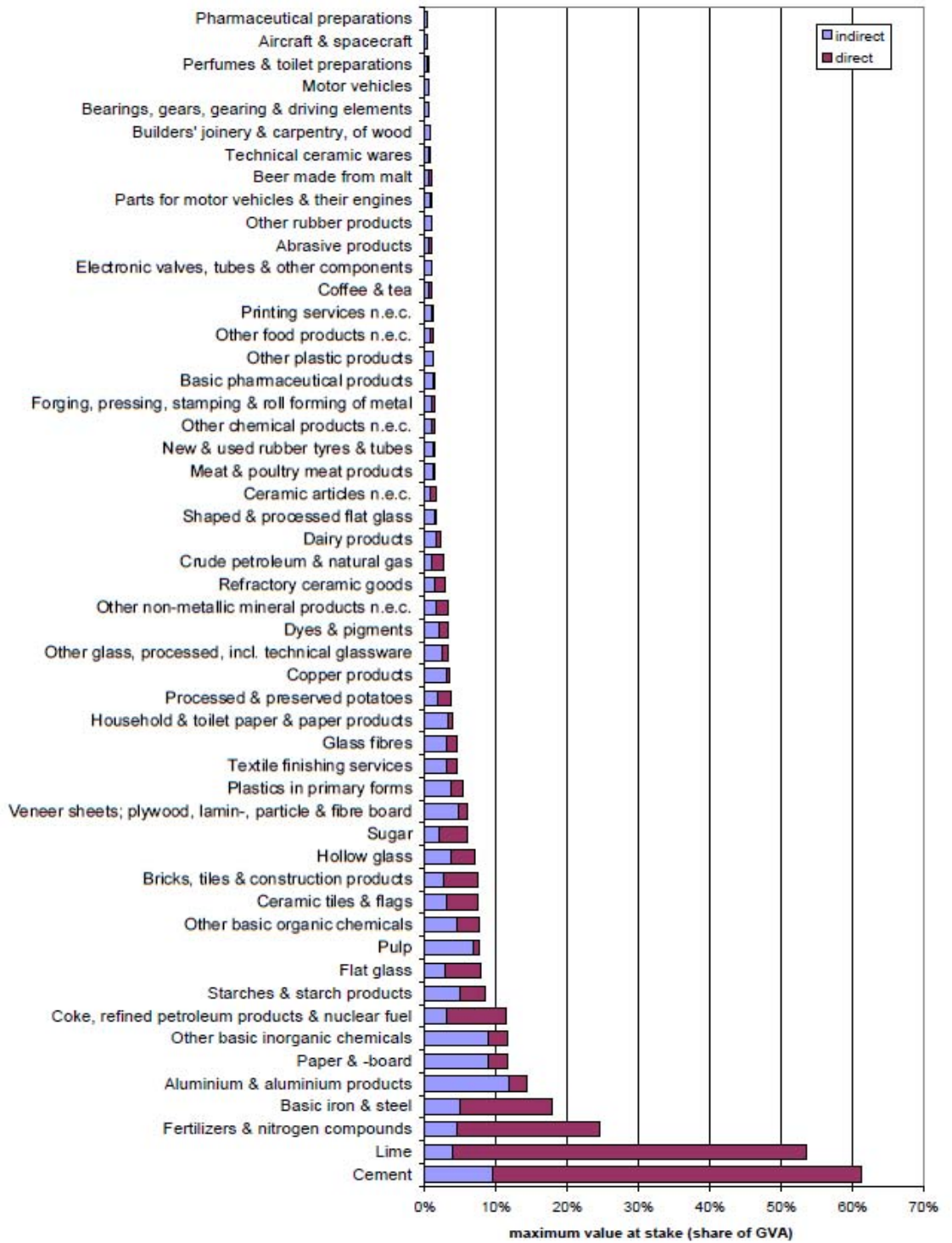
Trading Scheme the maximum gross value added at stake is below 2%⁵³

⁵¹ Impacts of the EU Emissions Trading Scheme on the industrial competitiveness in Germany, Research Report 3707 41 501 UBA-FB 001177; Federal Environment Agency, Germany, September 2008

⁵² Öko Institut , Fraunhofer ISI and DIW

⁵³ Graichen (2008), p.12

Maximum value at stake as share of gross value added for German industrial sectors, 2005



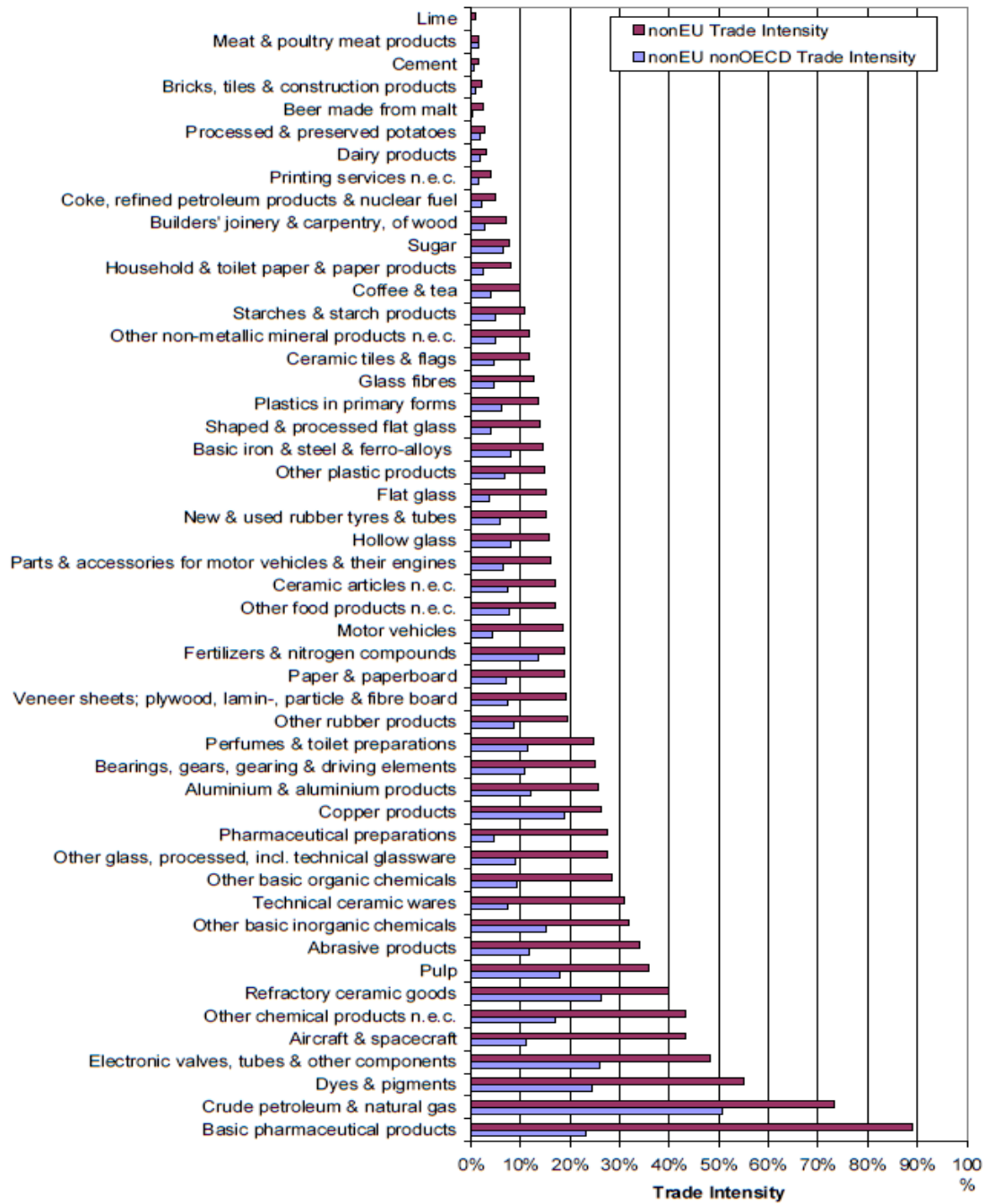
Sources: German Statistical Institute
Impacts of the EU Emissions Trading Scheme

Figure 3: Maximum value at stake as share of gross value added for German industrial sectors, 2005

The second part of the mentioned study covered the aspect of “Trade Intensity”. The intensity of competition with producers from other countries differs significantly between industrial sectors. The indicator ‘trade intensity’ relates the sum of traded goods to total market supply (the sum of domestic production and total imports of the country under consideration)⁵⁴

⁵⁴ Graichen (2008), p.18

**Trade Intensity for Germany with countries not belonging to the EU
and with countries neither belonging to the EU nor to the OECD, 2005**



Sources: German Statistical Institute
Impacts of the EU Emissions Trading Scheme

Figure 4: Trade intensity for Germany with countries not belonging to the EU and with countries neither belonging to the EU nor to the OECD, 2005

The analysis shows that roughly one quarter of the sectors face a trade intensity with non-EU countries of less than 10%. Half of them face intensities between 10% and 25%; and the remaining quarter faces intensities of over 25%. Naturally exposure to non-EU competition will always be higher than exposure to non-EU and non-OECD competition; for some sectors the difference is higher than for others depending on the main trading partners. It has to be kept in mind, that intensity of trade is only a proxy for, but not equal to, the intensity of competition. Beside output prices other factors like market segmentation (commodity versus specialized product); level of support services and cooperation between customer and supplier, cost of the logistic chain in relation to the value added of the product and last not least the issue of exchange rate volatility are also key factors.⁵⁵

The analysis of trade intensities and value at stake showed that a small number of sectors may in fact be exposed to distortions in competitiveness due to both high trade intensity and high value at stake. For Germany, these include “basic iron and steel”; “fertilizers and nitrogen compounds”; “paper and paperboard”; “aluminium and aluminium products” and “other basic inorganic chemicals”. A number of other sectors reveal a high intensity of trade but low value at stake which implies that the increase in product costs due to the EU ETS is relatively small and negative effects on competitiveness may not be likely. Similarly, sectors with high EU ETS related cost effects but low trade intensity are not expected to be significantly threatened by distortions in international competitiveness. It has to be kept in mind that the indicator evaluating the intensity of trade, is only a proxy for, but not equal to, the intensity of competition, which in itself depends on a mix of hard- and soft skills (e.g. market segmentation, logistical cost, Service, exchange rate, etc.) which also vary over time and are subject to technological change (e.g. local presence of highly skilled service personnel vs. Video conferences and remote control through internet).

For the sectors that reveal high values at stake and high trade intensities, market positions are likely to change under the EU ETS due to increased production costs and high exposure to international competition. Firms may need to adjust their

⁵⁵ Graichen, (2008), p.18

activities which may involve shifting production - or even relocating their business activity - to countries without comparable mitigation policies, which would imply carbon leakage.

Approaches to address competitiveness effects and leakage concerns would ideally be considered on a sector by sector basis. They include continued free allocation of emissions rights (grandfathered or output-based), direct payments to affected sectors, sectoral agreements and border adjustment measures. Such policies would allow pursuing unilateral stringent emissions reductions while not putting the economic performance of those sectors at stake. In some cases economic distortion through indirect cost effects can occur even with free allocation of emissions allowances to industrial sectors. In order to keep international trade distortions within the European Union at a minimum, harmonized allocation rules, such as sector specific minimum auction requirements, will be essential⁵⁶.

⁵⁶ Graichen (2008), p.39

5. The Austrian Case.

The Strategy of large Emitters

5.1 Quantitative approach

5.1.1 The questionnaire

The questionnaire itself was prepared focusing on large emitters in Austria and CEE, based on the methodology at present in use by the Carbon Disclosure Project (CDP)⁵⁷ an independent not-for-profit organisation which holds the largest database of corporate climate change information in the world. The data is obtained from responses to CDP's annual Information Requests, issued on behalf of institutional investors, purchasing organisations and government bodies. Since its formation in 2000, CDP has become the gold standard for carbon disclosure methodology and process, providing primary climate change data to the global market place.

The questionnaires design covers 7 chapters and has been used also as basis for the personal interviews with members of the emitter's management team.

The chapters are:

1. Investors Expectations.
Objective: To understand investors demands.
2. Risk and Opportunities.
Objective: To identify strategic risks and opportunities and their implications.
3. GHG Emissions Accounting.
Objective: To determine actual absolute GHG emissions.
4. Performance Objectives.
Objective: To determine performance against target and plans to reduce GHG emissions.

⁵⁷ Carbon Disclosure Project, www.cdproject.net

5. Governance Objectives.

Objective: To determine responsibility and management approach to CO2 / Climate Change

6. Individual Performance.

Objective: Understand the companies Interface with stakeholders.

7. Personal Opinions & Points of View.

Objective: Understand the personal views and believes of the interview partners.

The questionnaire was sent out the persons indicated in the on EU Community Transaction Log⁵⁸, however the return rate proved to be very low (10 units for Austria and 5 units for Slovakia).

5.1.2 Evaluation

The answers of the individual companies have been anonymised and summarized. The valuation of each answer is provided in the enclosed chart. The data is transformed into graphics by the use of Excel Software.

⁵⁸EU Community Transaction Log
<http://ec.europa.eu/environment/ets/allocationCompliance.do?registryCode=AT&periodCode=-1&search=Search¤tSortSettings=>

5.2 Qualitative approach

In the original design of the study the interviews would provide for the qualitative part and further in-depth information on the data to be provided by the questionnaires.

The selection process was guided by the intention to provide a cross section of the sectors involved under the heading “CO2 Large Emitters”.

With 4 interviews in the utility sector (WIEN ENERGIE, EVN, VERBUND and Salzburg Energie AG) a significant share of Austria’s generation capacity is covered as well as the different exposure to international capital markets (EVN and VERBUND on the stock exchange; the other two as Province/City owned companies); covering RHI –Refractories a specific Austrian issue is attended to as magnesite is still being mined and reduced in rather large scale. With PERLMOSER Lafarge Group and Schmidt Industrie Holding (Trade Marks “BauMit” & “Wopfinger”) the cement & lime industry has been covered with a typical family owned innovative mid-size manufacturer and an international key player. RONDO-GANAHL AG, a key quality & innovation player in the Central European market for packaging cardboards covers the paper and pulp industry, with BOREALIS (OMV Group) one of Europe’s leading polyolefin’s and plastic compounds manufacturer providing information for the petrochemical industry. The sector Food & Agriculture including Bio-ethanol is represented by SÜDZUCKER (Agrana). The steel /metal industry, although on a personal level very interested in the subject, declined to officially participate in the study as fears of contradicting information could be made public, at a time of intensive negotiations on EU ETS Phase III and COP 15 / Copenhagen taking place⁵⁹.

Having gained personal access to directly responsible top management each interview worked through the complete questionnaire, with the interviewees providing at least one hour, in average 90 minutes for an intensive discussion on the questions raised. Specific data had by in general been filled in previously by line management.

⁵⁹ Compare a recently published paper commissioned by Corus Steel NL. ‘The Climate for Steel. Actions for, and conditions to, a Copenhagen climate agreement from the perspective of the EU Steel Sector’. CIEP / Clingendael Energy Paper, Netherlands, February 2009

Interviews with associations and interest groups helped round up some basic information⁶⁰, however with exception of “VÖZ - Vereinigung der Österreichischen Zementindustrie” provided little to no additional insight to the questions raised.

⁶⁰ Compare data provided by Industriellen Vereinigung: ‘Energie/Effizienz/Wachsen. Umwelt 2020, Vienna , June 2008

5.3 The responses

5.3.1 Investors Expectations.

Objective: To understand investors demands

In the following 4 charts the responses to the Chapter Investors Expectations has been summarized.

Almost all corporations (90%) have been confronted with questions on the implications of CO₂/Climate Change to their business model; however only 50% have actually seen a demand for a specific CO₂ Strategy, whereby 60% see the need for such a strategic approach. As some of the Austrian utilities are owned directly or indirectly by the provinces/municipalities (Länder / Gemeinden) they do not have a credit rating of their own, but reflect on the one of the province or city, and do de facto not really have direct negotiations with international capital markets. None of the companies had yet received “Non-compliance”.

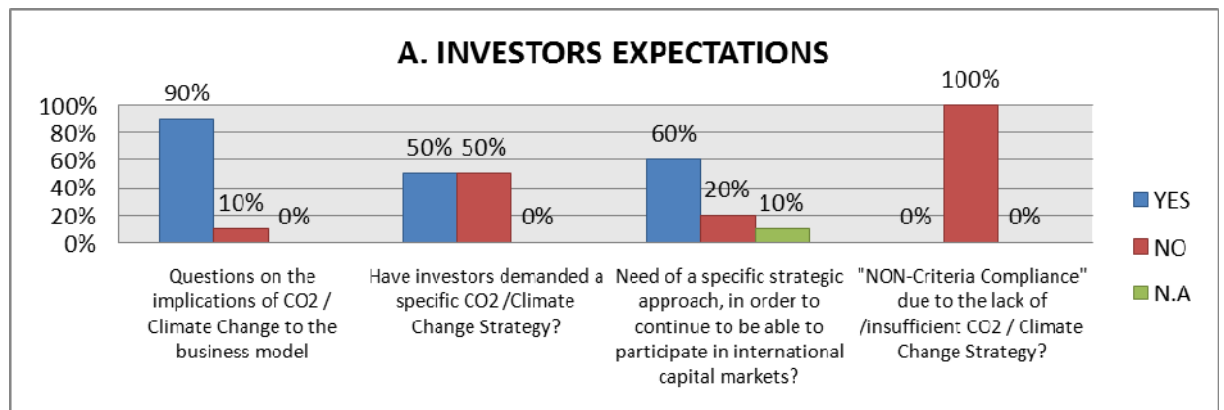


Figure 5: Investors Expectations

The need for CO₂/Climate Change strategy is regarded by 40% as a need now (less than a year), with the same amount perceiving such a need in the mid-term only (3-5 years), surprisingly 90% see their corporations well prepared to meet the demands by international capital markets.

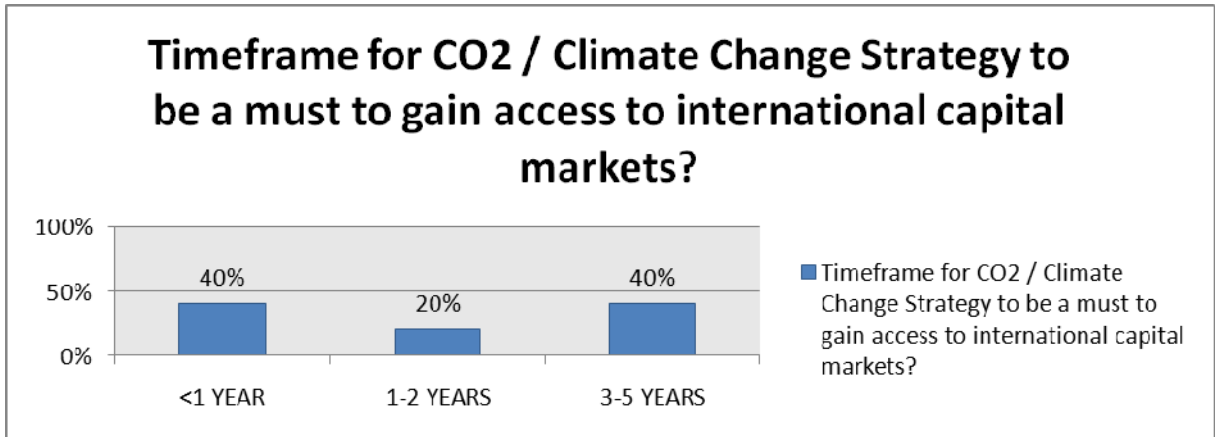


Figure 6: Timeframe for CO2 / Climate Change Strategy

The participation on Supranational Projects like ‘Carbon Disclosure Project’ with 40% YES and 60% NO, reflects by in general the size of the corporation in the international field, with more local companies no seeing the benefit of such participation. The fear of exposure of company data seems to be an important emotional issue (30%). This perception seems to in line with the data from CDP 2008⁶¹ (roughly 50% of the surveyed companies, and between 68% and 85% of responding companies allow responses to be public).

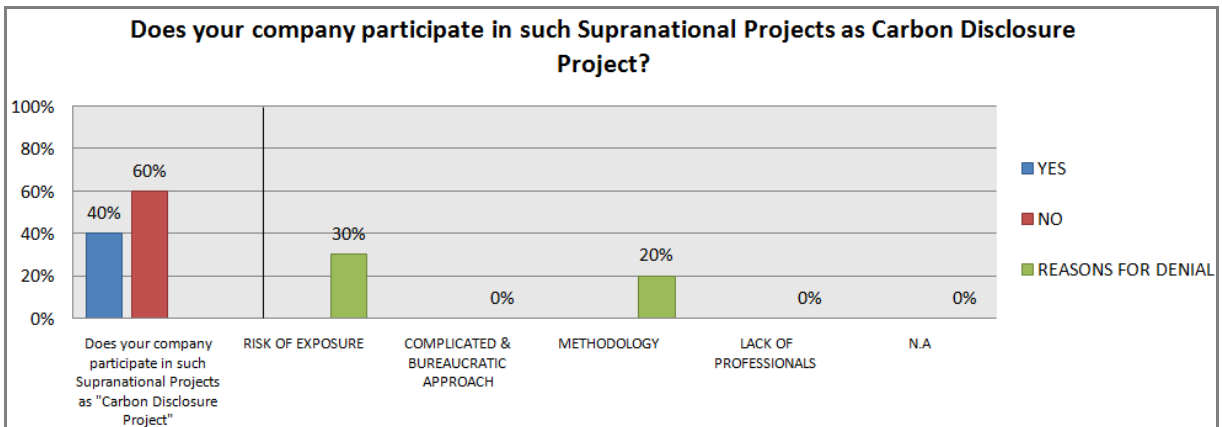


Figure 7: Participation in Supranational Projects

⁶¹ CDP, Quick Facts 2008, p.2

5.3.2 Risk and Opportunities.

Objective: To identify strategic risks and opportunities and their implications.

Exposure to Regulatory risks and Opportunities are almost balanced out (100% to 80%), however show one the main problems of the present handling of the climate change issue as there seems to be little trust in the stability of the planning horizon. The limited exposure to physical risk (20%) can also be explained with the specific Austrian situation (geography and climate).

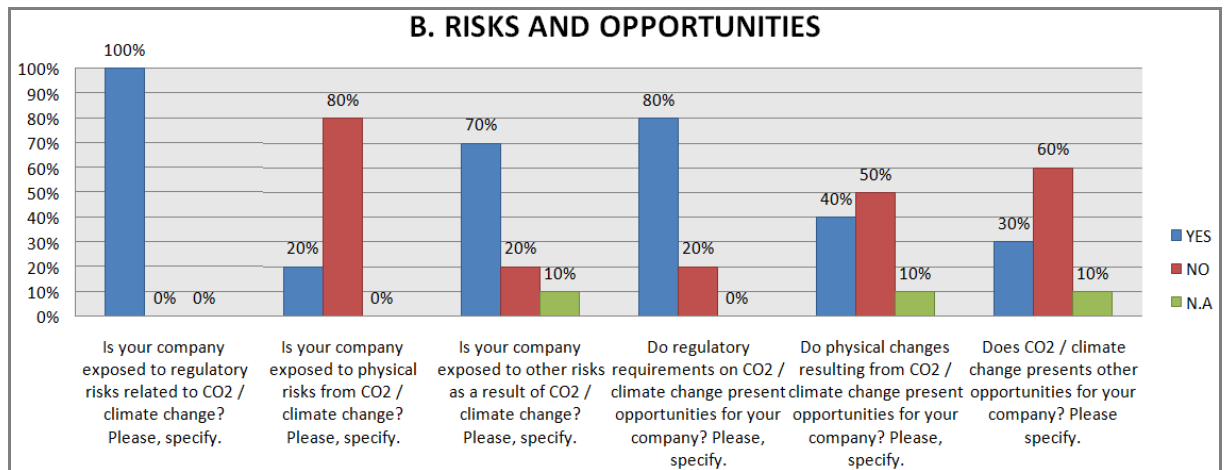


Figure 8: Risks and Opportunities

Carbon Leakage is a hotly contested issue. By splitting the response into “Historic” and “Future” we see a doubling (from 30% to 60%) of the companies in the high impact field “D” with a corresponding drop (from 40% to 20%) in the low impact field “A”. For the utilities carbon leakage is not an issue of any concern, as they know that for a foreseeable future the political establishment will hinder the move of any production capacities out of the EU ETS area. Also the different bottlenecks in transmission capacities help protect them in their present set up. The mining and cement industries see themselves as largely affected. In the cement/lime industry a dual development can be registered: the large multinational companies have already since some years embraced the issue of climate change and dedicated important management resources as well as research and development capabilities. The local

producers have by in large relied on their local political patrons to keep “climate change” off their balance sheets. With the establishment of the sectoral approaches after Copenhagen, the local producers will be marginalized.

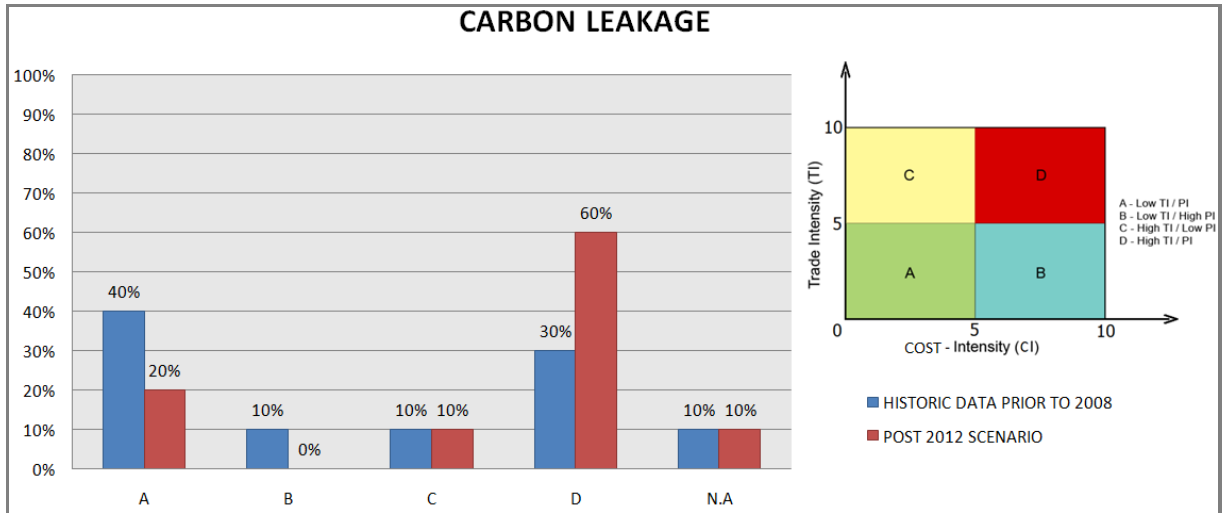


Figure 9: Carbon Leakage

Interesting is the expected timescale for the risks and opportunities to materialize, as only 20% seem them in the short term (less than 2 years) and the expectations for 3 to 5 years and larger than 5 years have an equal share of 40%.

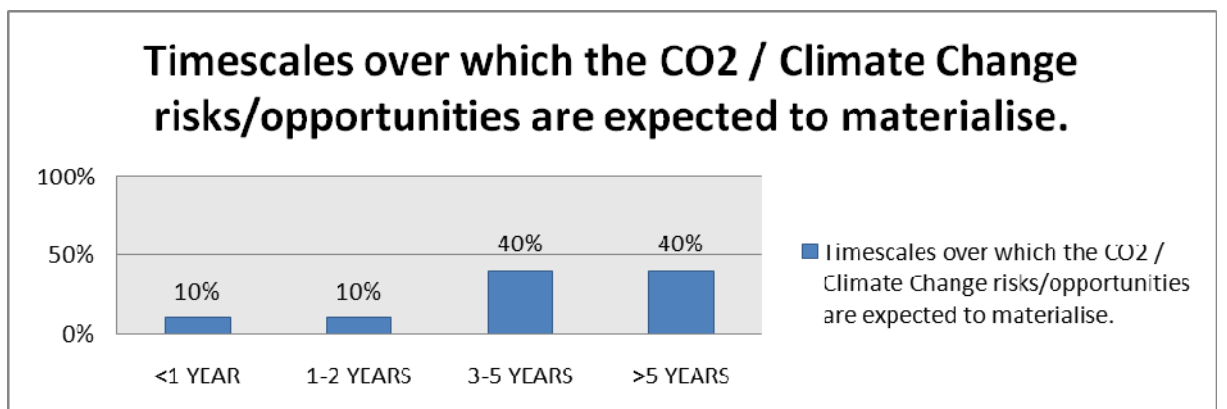


Figure 10: Timescales for Risks/Opportunities to materialize

Institutionalized processes for the identification of CO₂ /Climate Change related risks and opportunities, including the financial implications are in place with 70% of the corporations. The same share of respondents (70%) would comment on this

subject. At the same time 30% of the companies do not have such a process in place and rely on the continuation of business-as-usual for a foreseeable future.

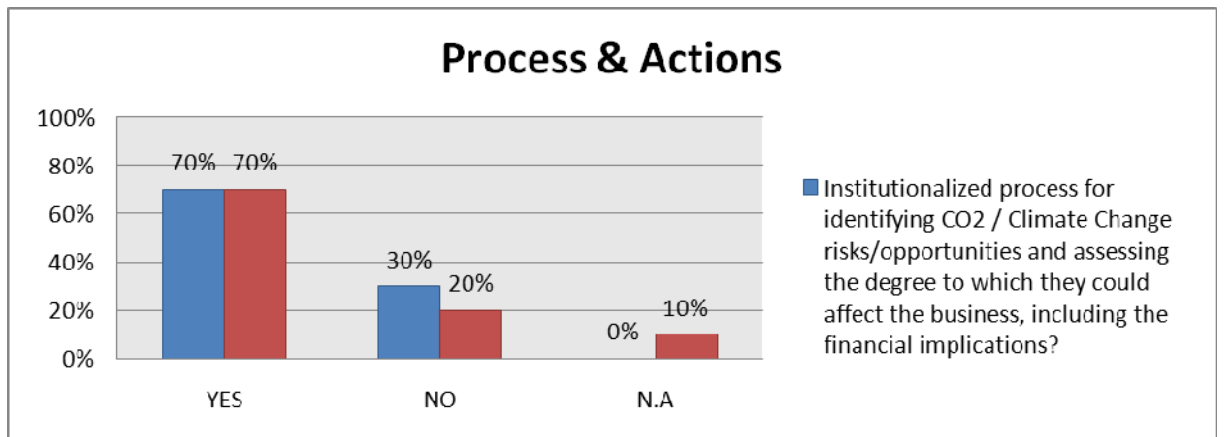


Figure 11: Process and Actions

The perception of CO2 / Climate change within the past year has changed with 40% of the companies and realizing that it will have a higher impact that previously expected. That with 60% no change has been registered can be attributed to the fact that many of the respondents had already an elaborate system in place with the corresponding awareness.

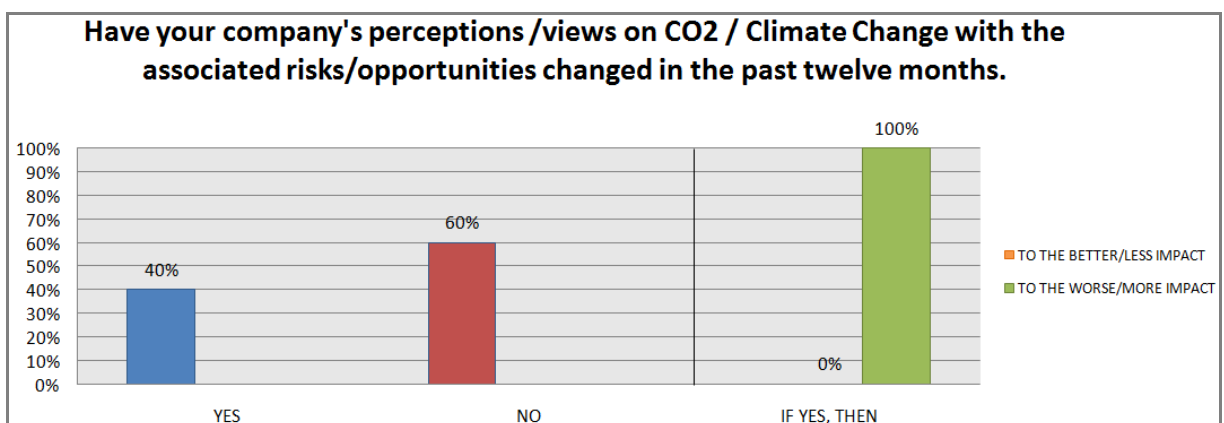


Figure 12: Perception change in the past 12 months

5.3.3 GHG Emissions Accounting.

Objective: To determine actual absolute GHG emissions

All respondent have an Emissions Accounting Procedure in place, cover Scope 1 emissions by means of a defined Standard, have these externally verified, with only 10% covering this within the ISO Quality Assurance System. Scope 2 Emissions are only accounted for by 40% of the corporations. Scope 3 emissions are only accounted for by 10%.

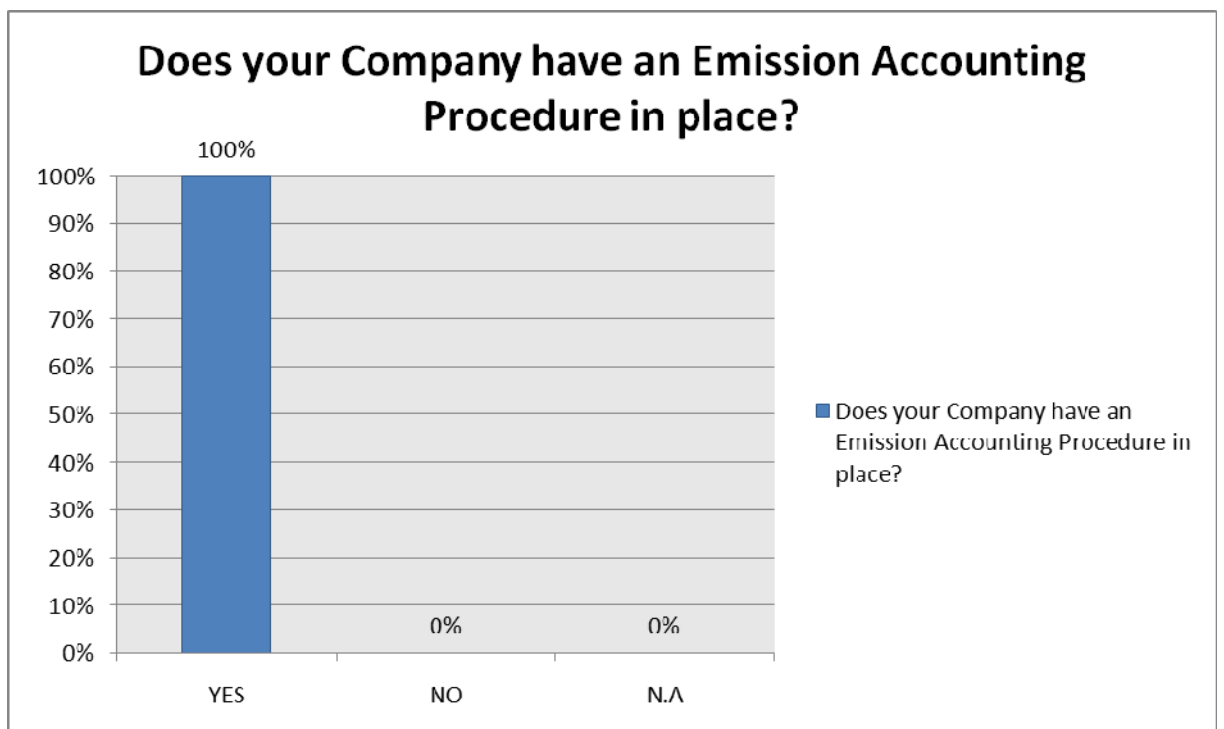


Figure 13: Emission accounting procedure

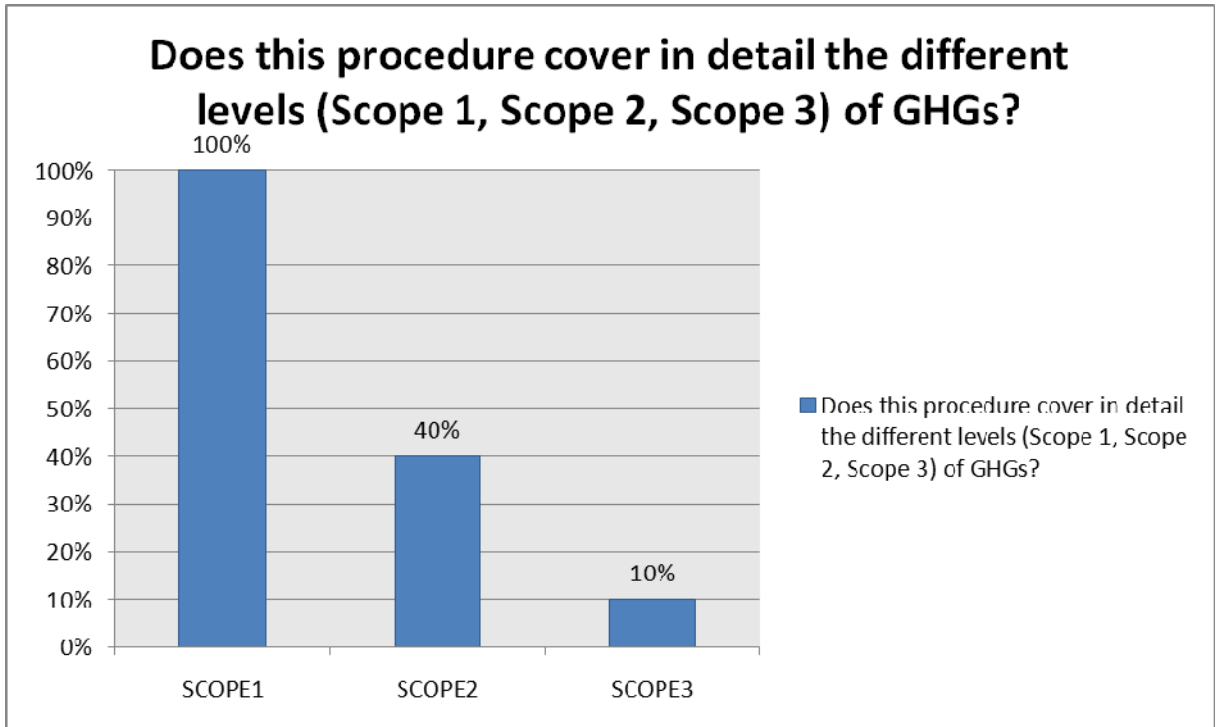


Figure 14: Coverage of scope 1,2,3 GHG`s

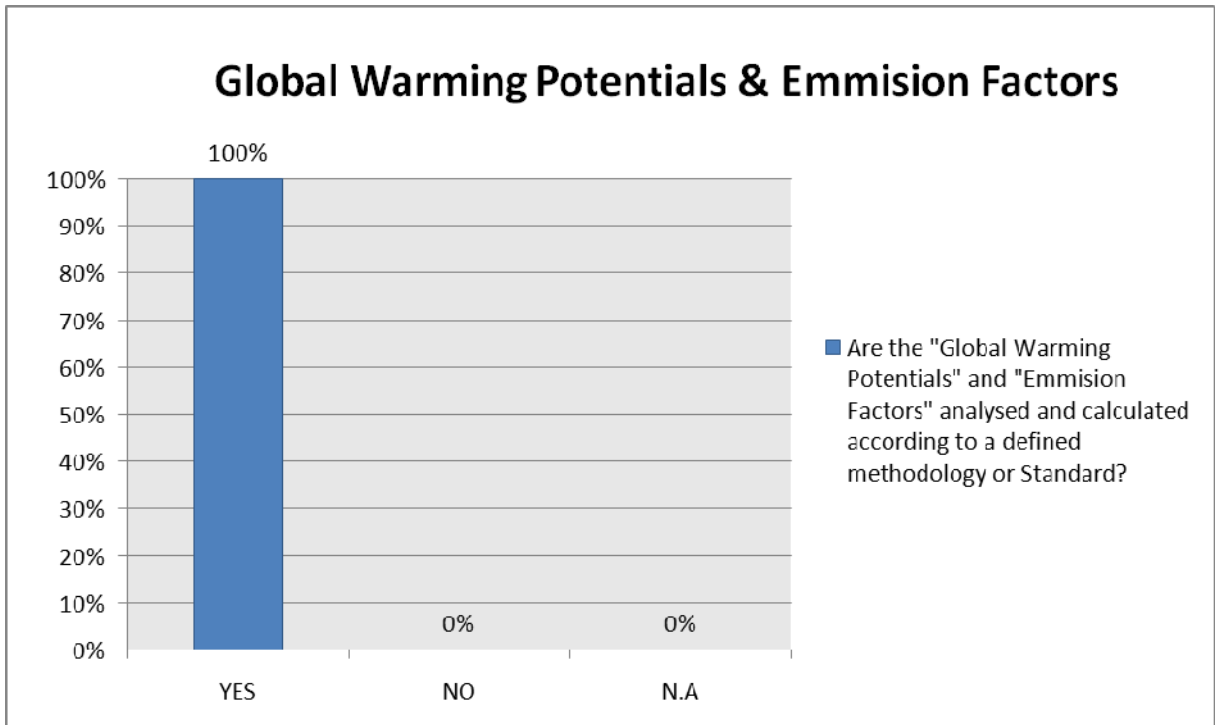


Figure 15: Global warming and emission factors

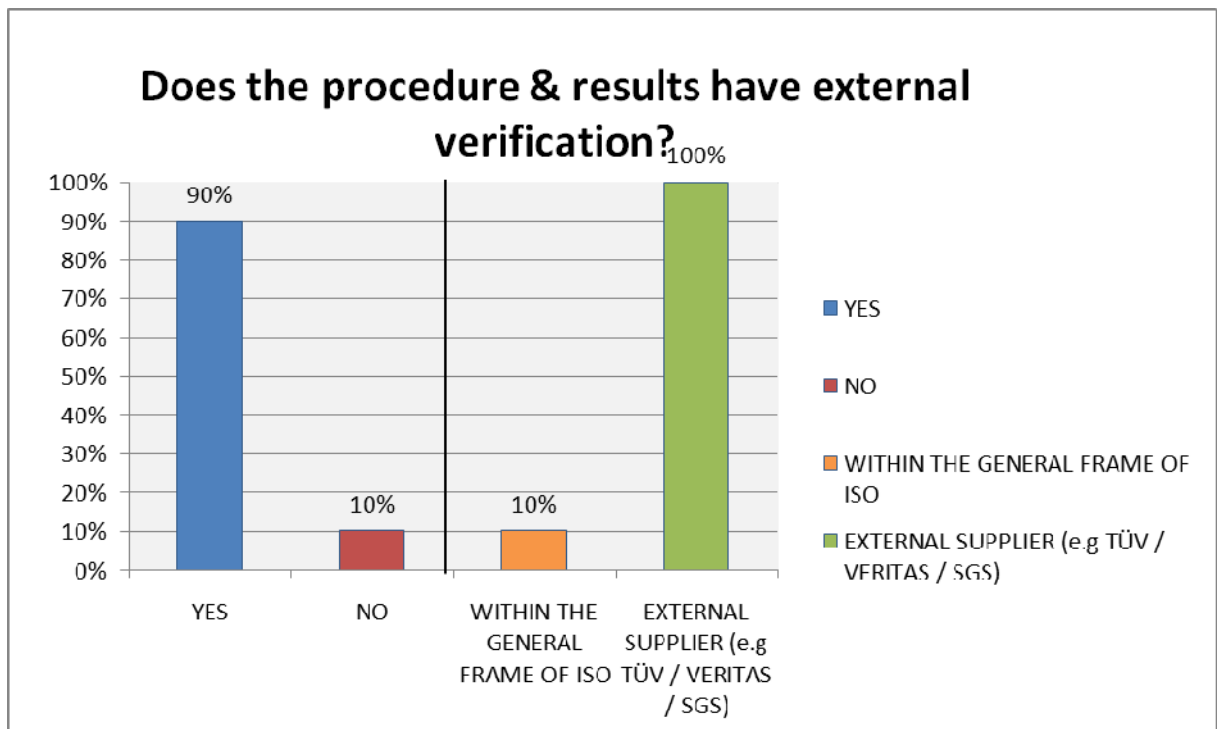


Figure 16: External verification

A comparison with Carbon Disclosure 2008 shows some differences. Between 68% and 77% of the CDP respondent account for Scope 1 –notably less than our sample– however between 63% and 72% cover also Scope 2 emissions. At the level of Scope 3 emissions the accounting is also modest with CDP respondents (between 3% and 15%)⁶².

The quantification of the profit/loss effect on the certificates awarded under Phase 1&2 has been made practically by all respondent (100% for Phase 1 and 80% for Phase 2), the willingness to disclose their cash effect on the bottom line (profit) reduces from 80% in Phase 1 to 50% in Phase 2 .

⁶²CDP, Quick Facts 2008, p.2

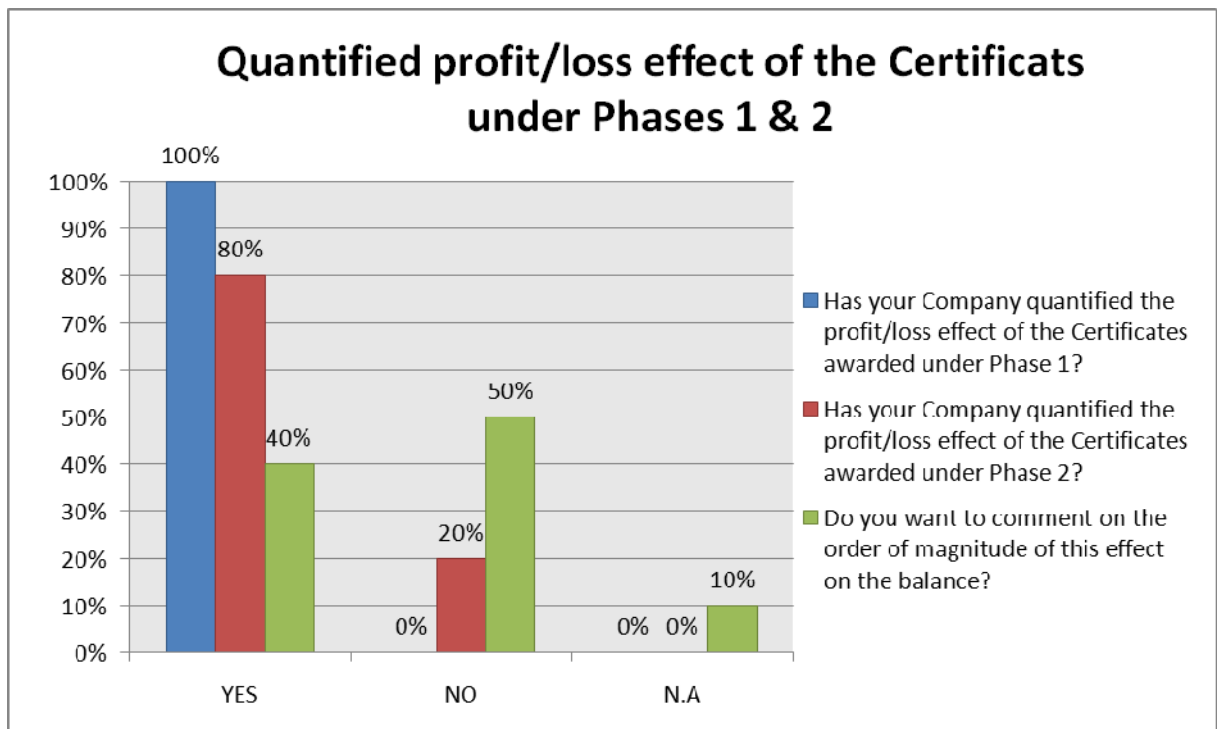


Figure 17: Profit and Loss effect of certificates in Phase 1 and 2

The allowances in Phase 1 proved to be over-allocated /long for 40% whereby in Phase 2 50% claimed to be short and the other 50% had the expectation that they balanced out well. When considering the answer “short” the economical boom phase lasting well into 2008 also has to be considered (commodities and energy prices reaching their peaks in mid 2008).

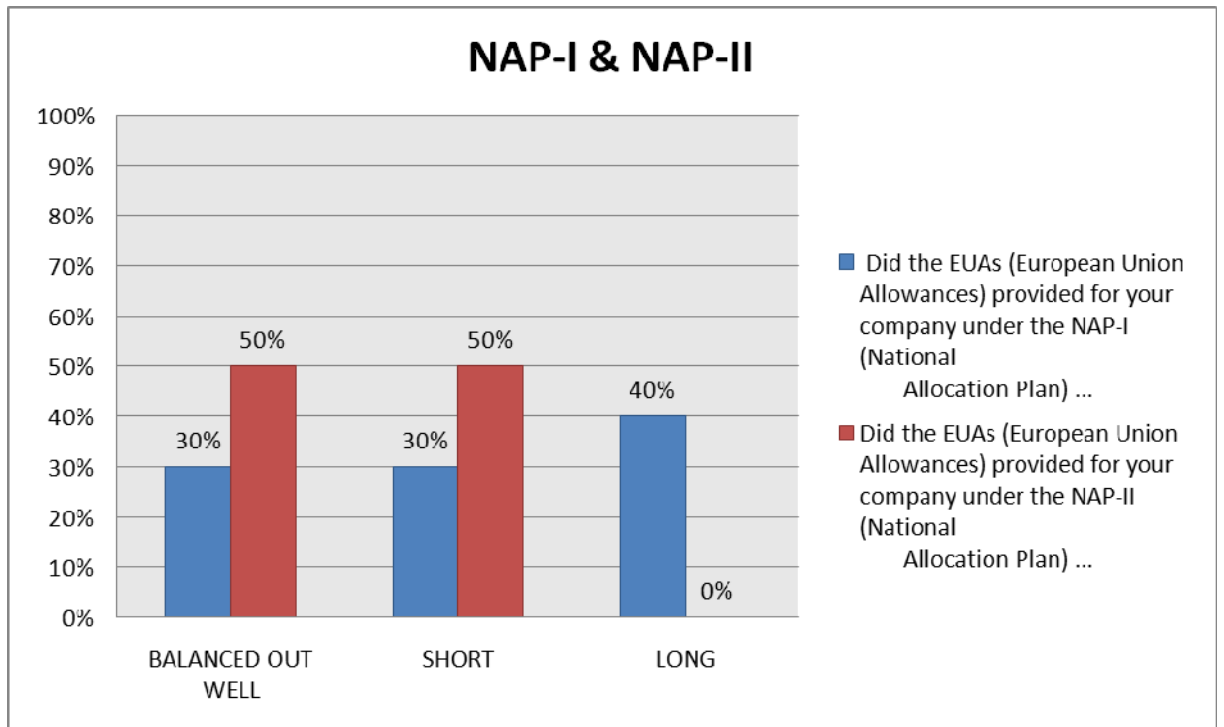


Figure 18: Allocations NAP-I and NAP-II

The expected impact of EU ETS on the company profitability sees a large variation depending on the sector the company is performing business. In average 50% see the impact as substantial and 30% as very low, which is contrast to the 10% which regard it as threatening.

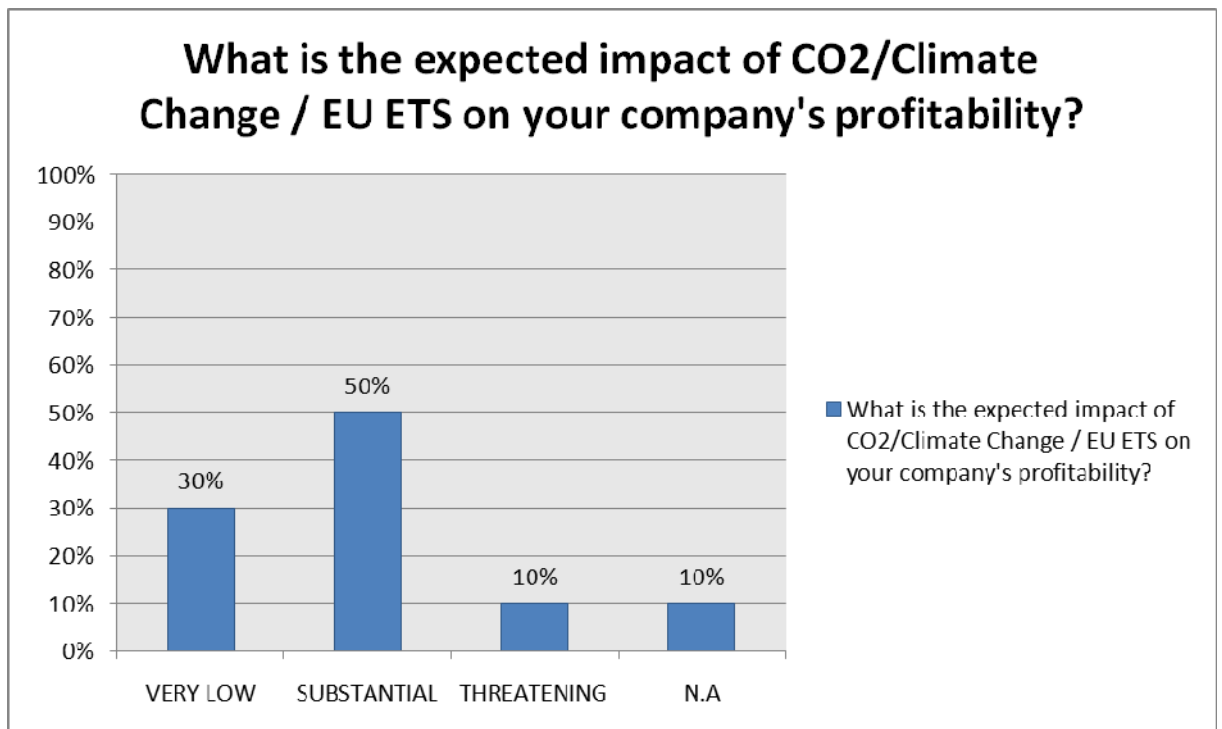


Figure 19: Expected impact on profitability

All of the interviewed companies have developed an emissions trading strategy, whereby 70% will make full use of the EU's SWAP Allowance and 30 % intend to make partial use of it. The Emission Strategy focus is to 80% on using and trading allowances (CDM & JI) and 50% want to use project based credits (multiple answers where possible).

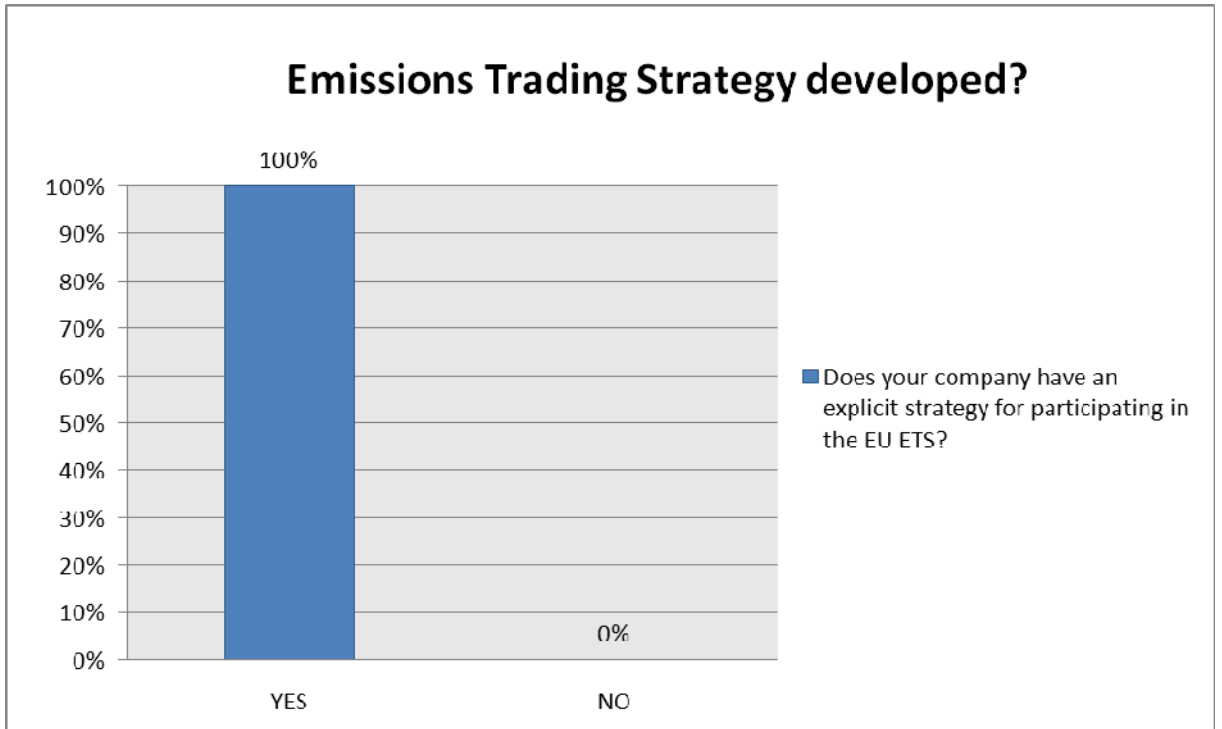


Figure 20: Emissions Trading Strategy

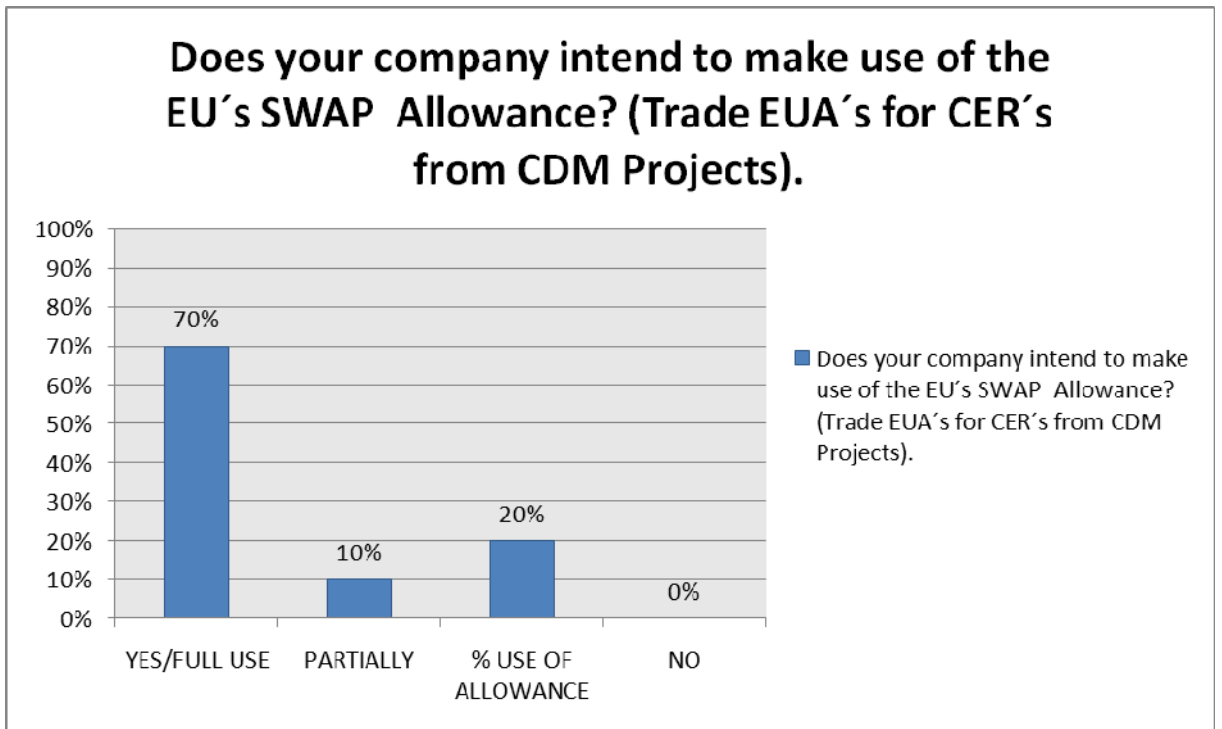


Figure 21: Use of EU's SWAP-Allowance

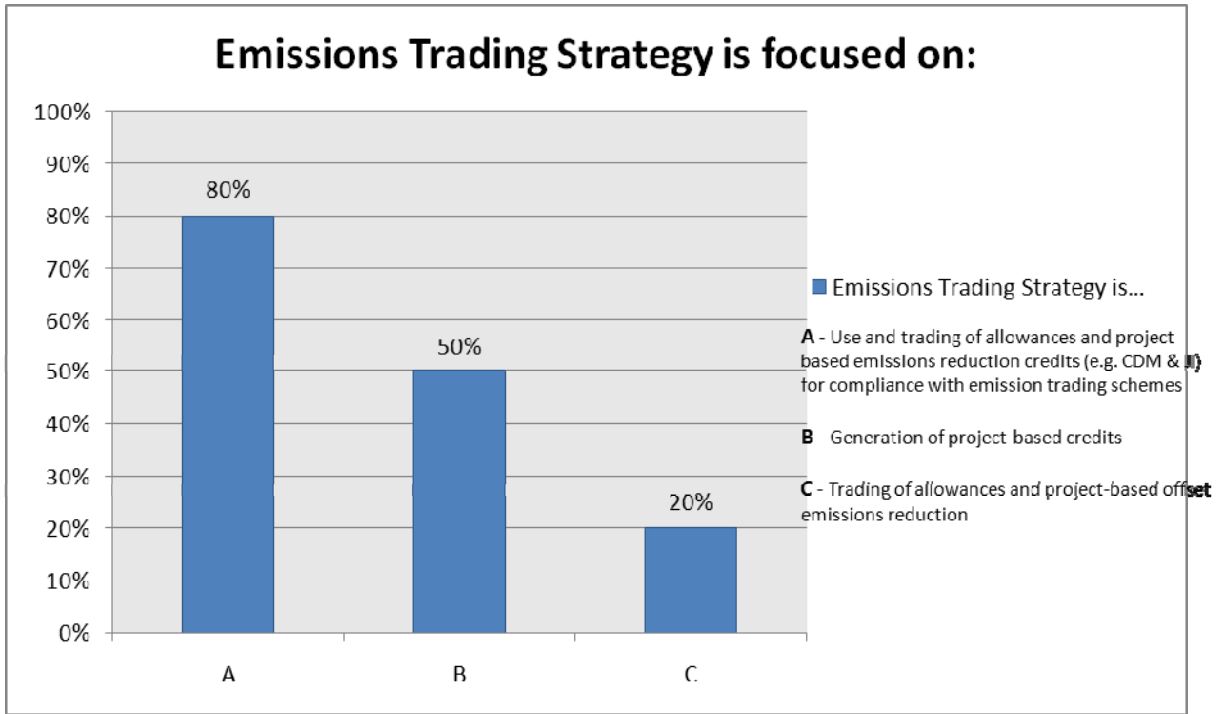


Figure 22: Focus of Emissions Trading Strategy

5.3.4 Performance Objectives.

Objective: To determine performance against target and plans to reduce GHG emissions

Almost all respondent companies (90%) have a GHG emissions reduction plan established and do account for future emissions in their regular planning procedures, whereby roughly half the companies monitor emission intensity financially (60%) and the other half (50%) as activity related measurement.

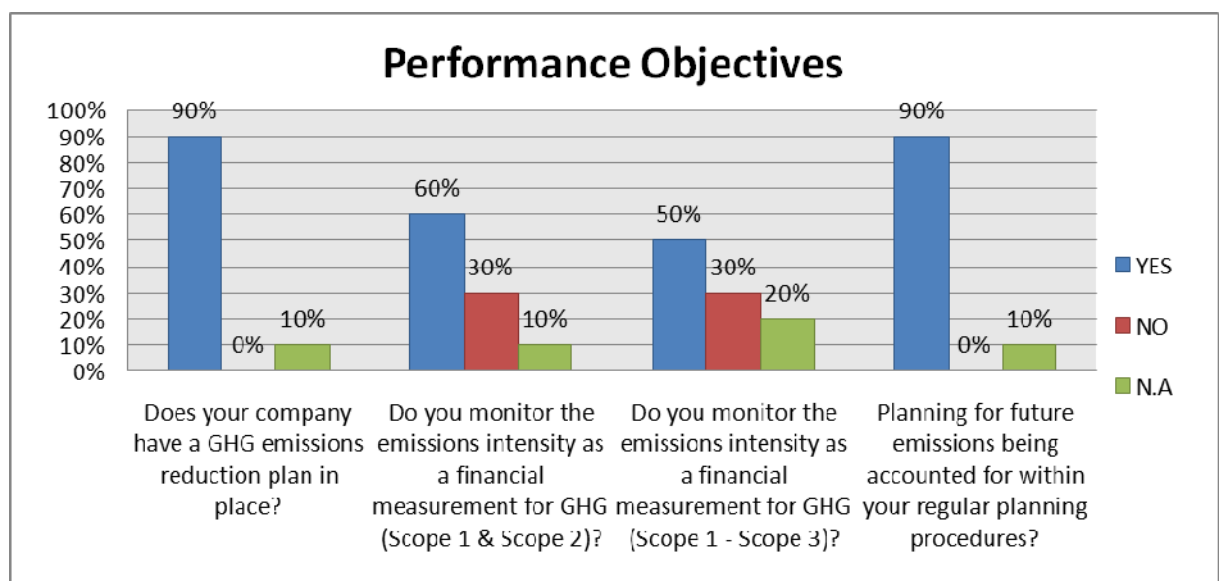


Figure 23: Performance Objectives

Goal setting and goal achievement is a regular optimization process for 50% and for 40% an important management tool. In some companies the CO2 reductions are clearly established as target in the individual managers MBO's (Management by Objectives). Half the respondents see their present tool/methodology as adequate to fulfill the reduction targets.

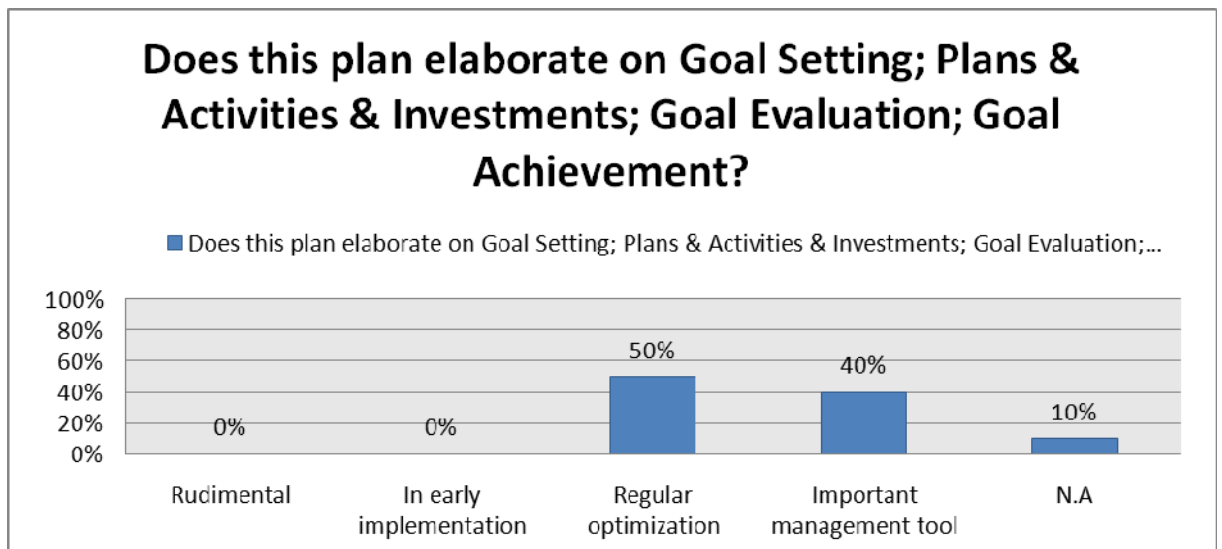


Figure 24: Goal Setting – Goal Evaluation

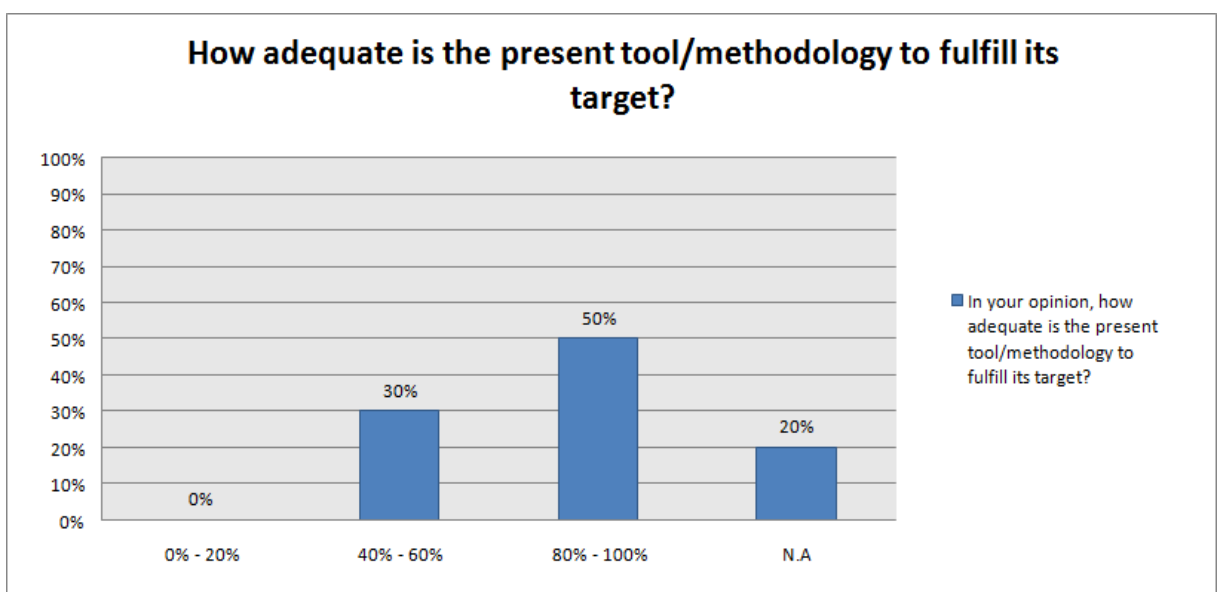


Figure 25: How adequate is the present tool to fulfill its target?

Carbon Capture and Storage is not yet regarded as an option in Austria (80%). This is most probably related to the fact that the technology is regarded as suitable primarily for very large emitters, and the interviewees – with two exceptions- do not regard themselves as such. In fact only one of the utilities has an active information exchange with a German utility on the performance of their CCS pilot plant. Informal consultations seem to indicate that Austria’s Ministry of Environment has allocated a

very modest priority to preparing the legal framework for CCS implementation in Austria. OMV with its twin interest –reduction of CO₂ in the refinery & petrochemical plant and new business for their depleted oil wells as CO₂ dumps – has up to now refrained from actively pursuing a CCS plant and storage capacity in Austria.

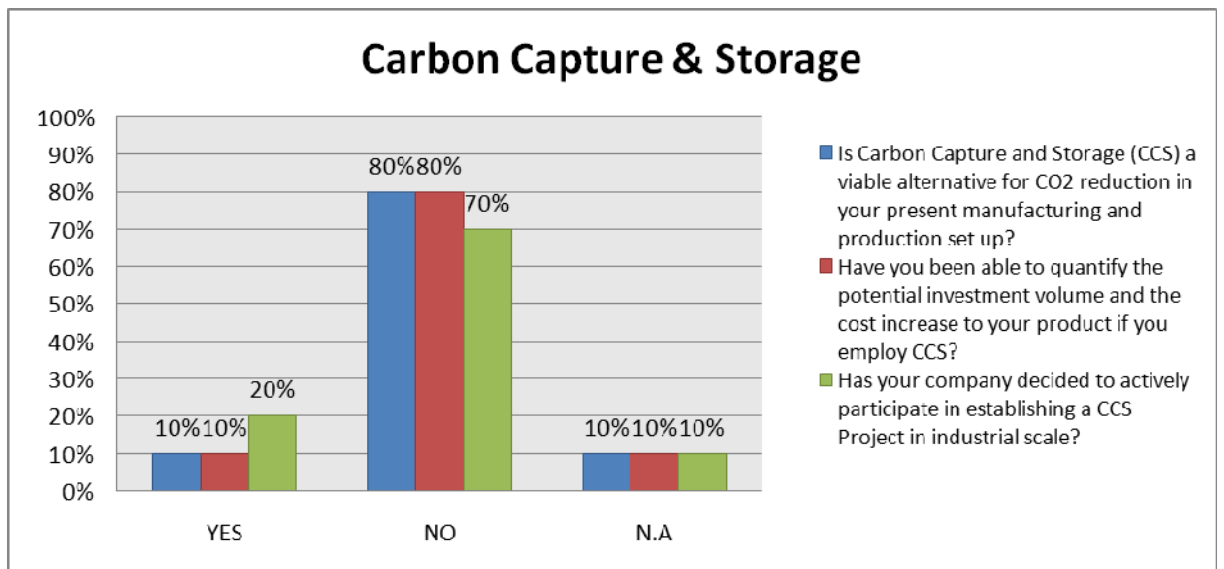


Figure 26: Carbon Capture and Storage - CCS

5.3.5 Governance Objectives.

Objective: To determine responsibility and management approach to CO2 / Climate Change.

A board Committee has with 70% the overall responsibility for the CO2 strategy and this topic is reported on a monthly basis (60%). For 80% of the companies the importance of the CO2 /Climate Change issue as raised within the past 12-18 months and for 88% is a key policy issue. The use of individual management targets (e.g. Management by Objectives) is practiced by 40%, and 10% are considering its implementation.

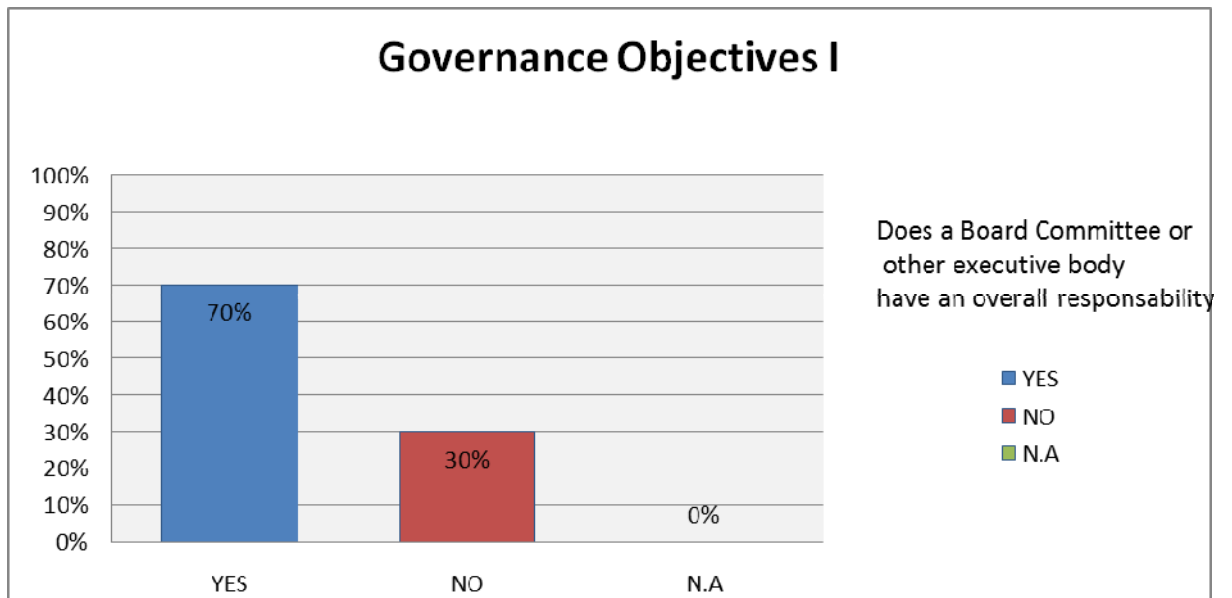


Figure 27: Governance Objectives I, responsibilities

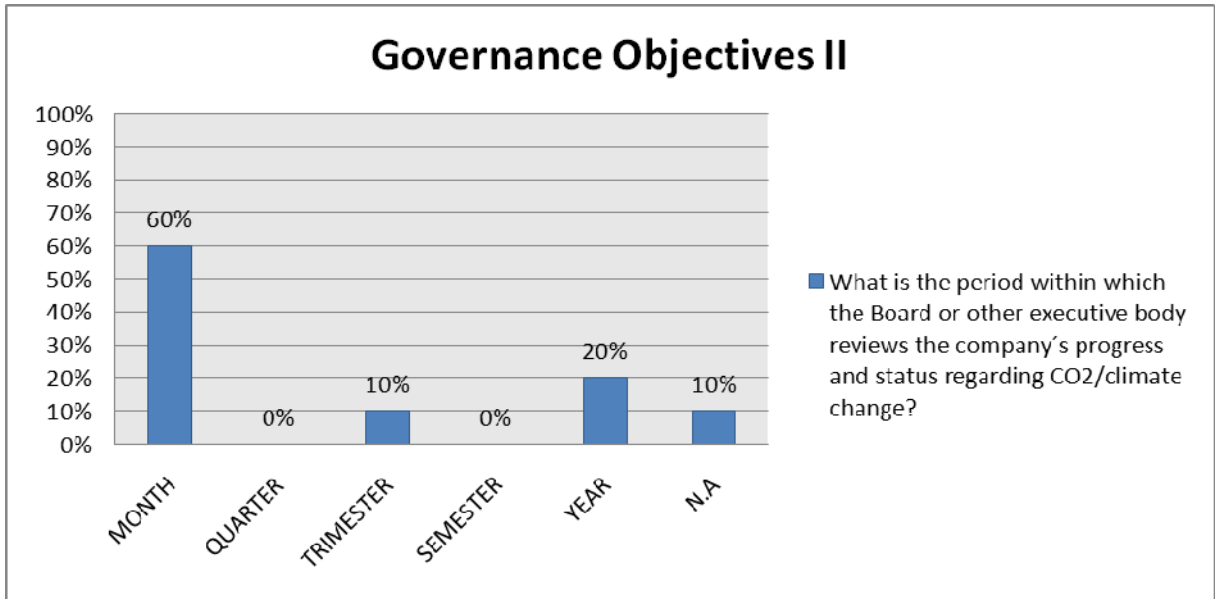


Figure 28: Governance Objectives II, progress review

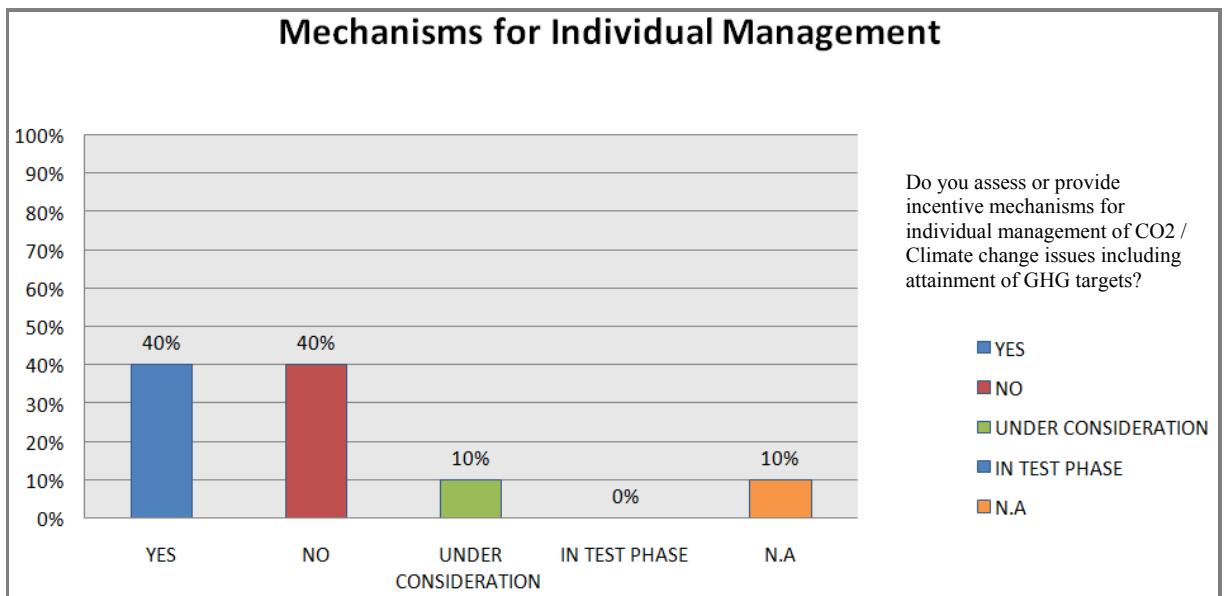


Figure 29: Mechanism for individual management

5.3.6 Individual Performance.

Objective: Understand the companies Interface with stakeholders

At the level of the individual performance of the companies the topic of participation in Voluntary Emission reductions (VER's) is regarded as primarily a marketing gag with very limited effect on climate change. 80% do not support these types of programmes.

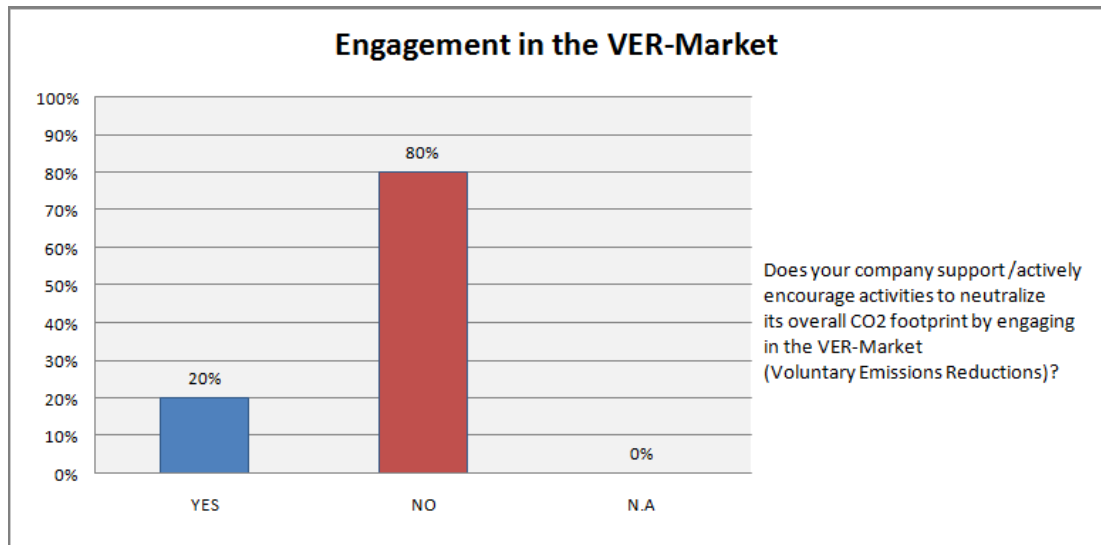


Figure 30: Engagement in the VER-Market

80% publish information on the risks and opportunities present by climate change to the public, most do so through their Annual Report (88%).

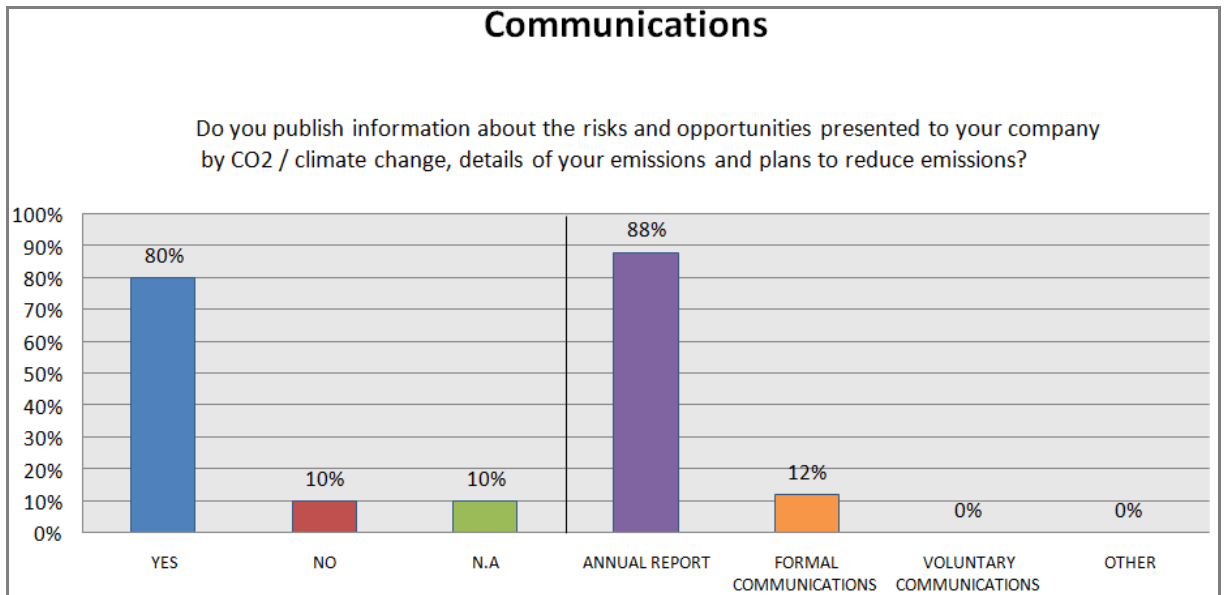


Figure 31: Publication of CO2/Climate Change related issues

Interesting is the fact that 50% of the executives see the theme Climate Change and what it means for the corporation “underrepresented “ on their Webpage and 10% intend to review it.

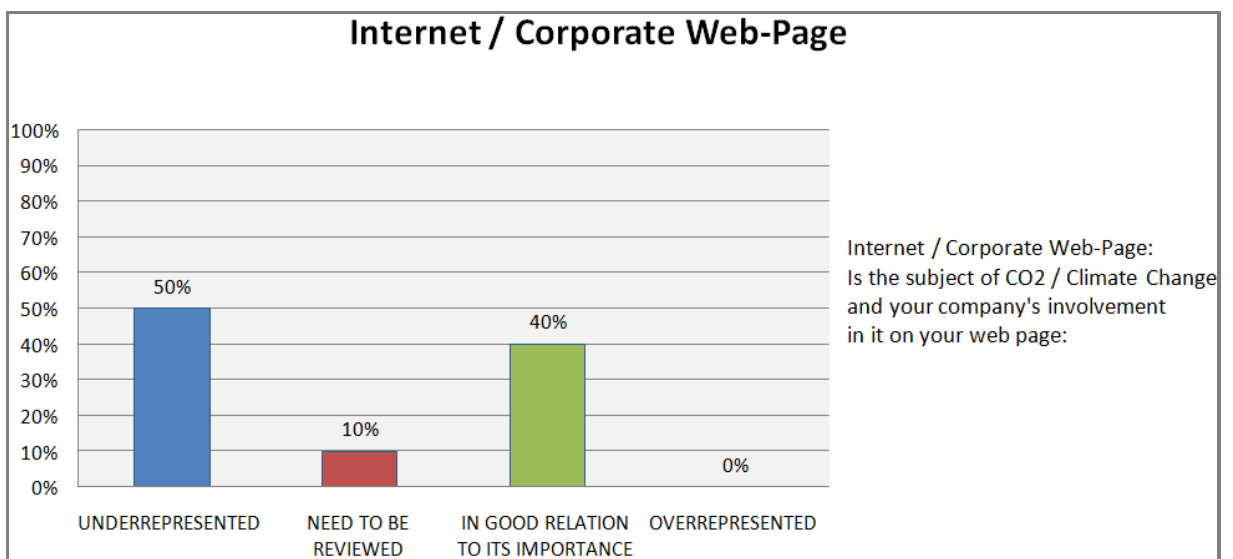


Figure 32: Webpage as communication tool

The response to Climate Change by the present EU policy is evenly distributed , as 30% each see it “fully inadequate”, in the “need of fine tunig”, or even “adequate” to the magnitude of the problem.

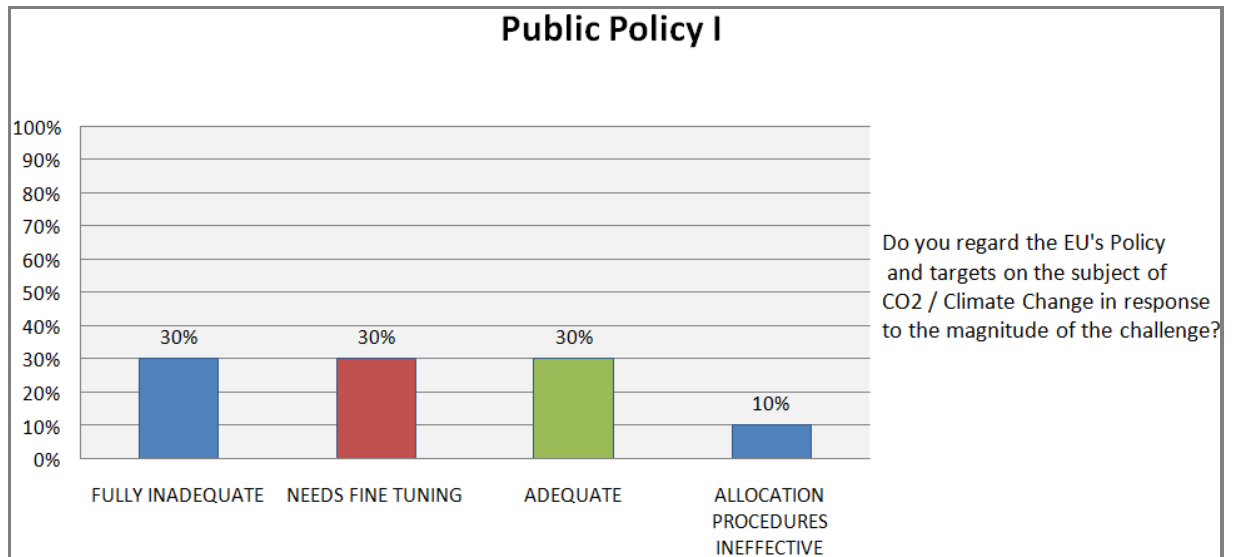


Figure 33: Public Policy I: EU policy on CO2/Climate Change

All companies do engage with policy makers, 80% through their industry associations, 50% do direct local political lobbying, and 30% even support directly EU lobbying activities.

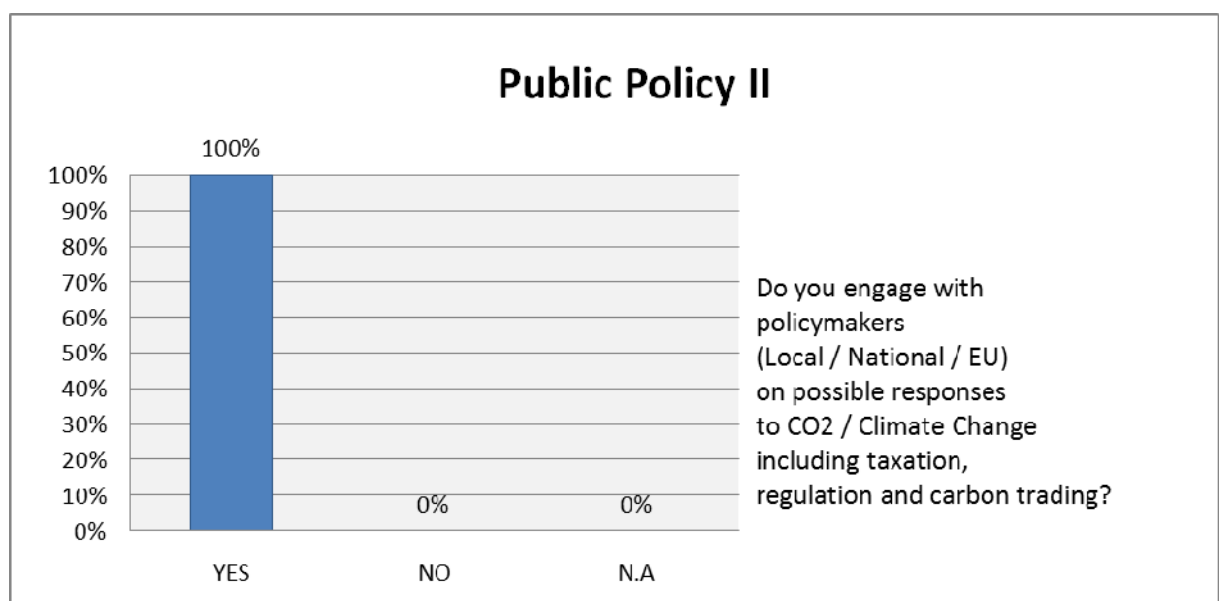


Figure 34: Public Policy II: engagement with policy makers

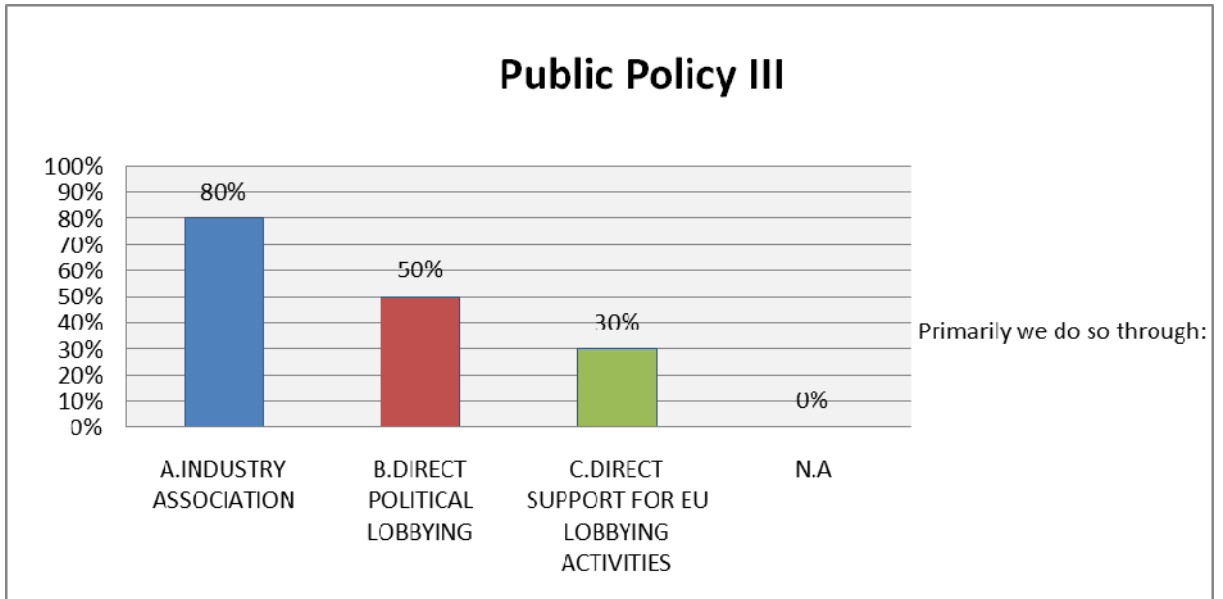


Figure 35: Public Policy III: contact to policy makers

The performance of the respective industry associations is regarded as correct for 50% and good or very good by the other half.

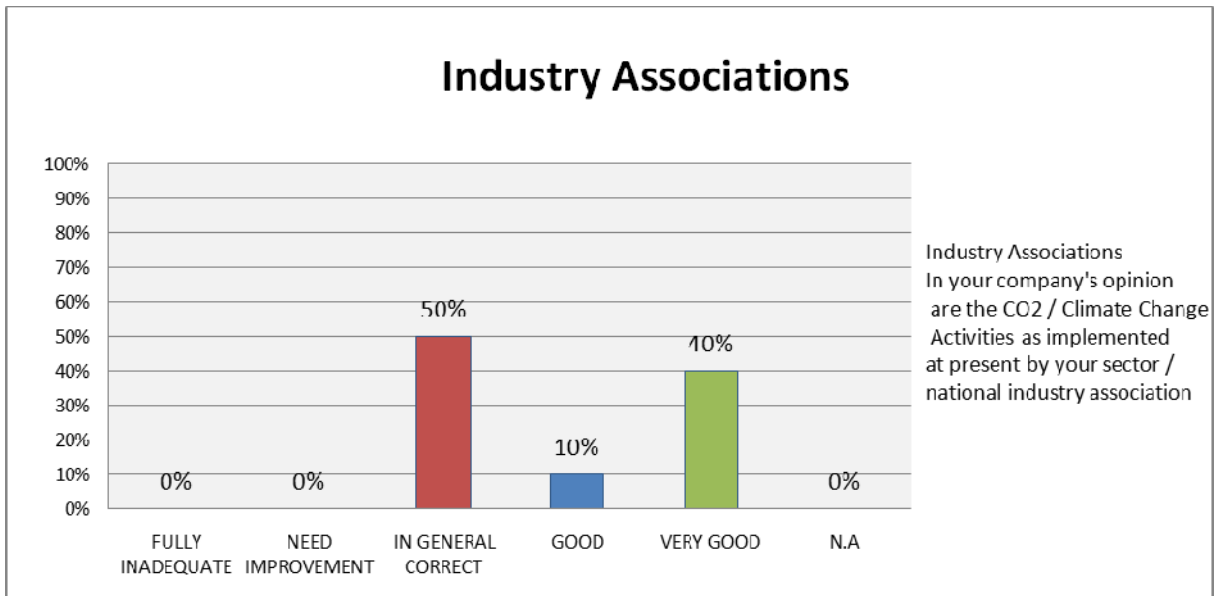


Figure 36: Industry Associations, satisfaction with their activities

The communications with stake holders on what climate change already means for companies today and much more so will mean in future needs a revision. The public and the customers need to understand that the change to a low carbon economy cannot be accomplished without cost and is plagued with uncertainties. A growing share of the brainpower and intellectual capacity being invested into the marketing and sales of the corporation's products and services, needs to be invested in this communications process⁶³. The engagement with policy makers must be more driven by the sincere need to find a reasonable consensus, than by the present attitude of seeing them as enemies.

⁶³ „You can always fool someone, you can sometimes fool everyone, however you will not be able to always fool everyone“ attributed to Abraham Lincoln (USA President)

6. Summary

Present Scientific Consensus is: climate change is happening and climate change is due to – a large extent- anthropogenic action in form of release of green house gases (GHG). The envisaged solution by policy makers is the transition of the present ‘high carbon’ economic system to a low carbon economy (worldwide emissions of only 5% to 15% of the CO₂e levels emitted in 1990). The envisaged time frame is 2050. Having had more than 30 years of experience in top management jobs with large international corporations, I felt the need to better understand the corporation’s plans and actions in regard to Climate Change. It is within our reach to (better) understand complex systems, in order to do so a direct dialogue and more transparency among the stake holders is essential, as well as more willingness to take some risks in sailing the yet un-chartered waters to “low carbon”.

To understand the actual status in decision making I focused geographically on Austria and on the implemented EU-ETS system proving an overview of the present working mode, explored options available for a Post Kyoto / >2013 scenario and checked on the policy uncertainty at present hindering mid term decisions in board rooms in Austria. The EU ETS economical implications are being explained from a macroeconomic perspective, the issue of carbon leakage is addressed and the overall results for a national economy present with the example of Germany. A questionnaire was developed based on the methodology in use by ‘Carbon Disclosure Project’ and used as guideline for a series of interviews with the top management of Austria’s large emitters. The results of these extensive interviews were evaluated using a valuation table and the data anonymised.

The large internationally traded corporations do have a clear understanding of the benefits provided by having and implementing a CO₂ /Climate Change strategy. The more local utilities and industry sectors have yet to fully understand, that having only a ‘fig leave’ discussion with the “public” will in the medium term become a clear competitive disadvantage.

The transition to a low carbon economy by 2050 or even attempting to reach the EU target of 20% or even 30% less GHG’s by 2030 is starting to develop within the strategic planning departments of some large corporations and rising rapidly in the priority scale of the board committees. For local utilities it seems to be of secondary

importance as the common believe is that CO₂ is just one more cost factor that will be passed on to the customer/end-user anyway.

Emission accounting systems and their burdensome bureaucratic procedures are in place.

Scope 2 and Scope 3 emissions need to be much more present on the screen of managers as changes/reductions are more difficult to implement and need a higher degree of inter-company cooperation to become effective. On the wind fall profits due to over-allocations in NAP 1 and possibly NAP 2 the industrial companies have them quantified and do talk about it. Utilities by in general tend to be very discreet about the subject, if they acknowledge it at all.

Within all companies interviewed potential CO₂ cost and or higher energy cost for electricity are being accounted for in the investment procedures. Usually as one more cost type in general with a value of €20 to € 25 per ton over the life cycle of the investment.

Carbon Capture and Storage implementation has a very limited opportunity in Austria⁶⁴ as for a foreseeable future none of the bureaucratic institutions (Ministries and alike) involved in the approval process are willing to burn their fingers on this issue.

Perceptions are changing for the better –realizing the risks and potentials of Climate Change - and corresponding measurable steps are being implemented. “What gets measured, gets done”

The communications with stake holders on what climate change already means for companies today and much more so will mean in future needs a revision. The public and the customers need to understand that the change to a low carbon economy cannot be accomplished without cost and is plagued with uncertainties. A growing share of the brainpower and intellectual capacity being invested into the marketing and sales of the corporation’s products and services needs to be invested in this communications process⁶⁵.

Within a reasonable band width and in good position compared to the corporations cooperating with Carbon Disclosure Project, Austria’s large emitters have a defined

⁶⁴ For a differing opinion see ‚Carbon Capture and Storage in Austria’ by Hermann Pengg-Bührlen, Vienna, December 2008

⁶⁵ „You can always fool someone, you can sometimes fool everyone, however you will not be able to always fool everyone“ attributed to Abraham Lincoln (USA President)

CO2/Climate Change strategy and are implementing it. No similarities in the strategy could be defined, as the industry sectors interviewed were very different.

In future the engagement with policy makers must be more driven by the sincere need to find a reasonable consensus, than by the present attitude of seeing them as enemies. This of course applies in the same if not even larger extent to NGO's. Both have to evolve fast from their present positions if the world is going to get some results in Copenhagen, that are more than just a political declaration of will, with little chance of becoming operational prior to the expiration of the Kyoto Protocol.

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„Finanzkrise als Klimaschützer“
Financial Times Deutschland 09.10.2008

„Druck auf EU-Umweltausschuss: Finanzkrise gefährdet Klimaschutz“,
Financial Times Deutschland, 05.10.2008

7.4 Personal Contact

Table 2: Interview Partners

NAME	FUNKTION	UNTERNEHMEN	INDUSTRY	ORT	DATUM
Dr. Andreas Meier	CEO	RHI AG	Refractory Materials & Services	Vienna	19.11.2008
DI Martin Spannagel	CEO	Perlmoser Austria (Lafarge Group)	Cement	Vienna	16.02.2009
DI Michael Frey	CTO	Rondo Ganahl AG	Paper & Corrugated Board	Frastanz	24.01.2009
DI Mag Gudrun Senk	Energy Economics / CO2 Management	Wien Energie	Utility	Vienna	11.03.2009
Robert Schmidt	CEO	Schmid Industrieholding AG	Cement / Lime	Piesting	11.12.2008
DI Sebastian Spaun	Managing Director	Vereinigung Österreichische Zementindustrie	Cement / Lime	Vienna	01.12.2008
Mag. Bernhard Nagiller	Chief Executive Assistant	RHI AG	Refractory Materials & Services	Vienna	04.12.2008
Dr. Mag Claudia Grill	Koordinator Umweltprodukte	Verbund - Austrian Power Trading AG	Utility	Vienna	15.07.2009
DI. Manfred Grader	CO2 Trading Manager	EVN AG	Utility	Maria Enzersdorf	12.03.2009
Dr. Lieven Stamans	Group Manager Energy & Environment	Borealis Polymers N.V.	Petrochemicals	Telephone Interview	16.03.2009
Dr. Carlos Nähle	Management Umwelt & CO2	Südzucker AG / Agrana AG	Food and Bioethanol	Telephone Interview	06.03.2009

NAME	FUNKTION	UNTERNEHMEN	INDUSTRY	ORT	DATUM
Mag. Reinhard Fischer	CO2 Manager	Salzburg AG für Energie, Verkehr, und Telekommunikation	Utility	Telephone Interview	05.03.2009
Dr. Marianne Moscoso- Osterkorn	CEO – International Director	REEEP – Renewable Energy & Energy Efficiency Partnership	NGO	Vienna	28.10.2008

8. APPENDIX

8.1 Questionnaire „CO2 Emissions Strategies of large Emitters”

8.2 Evaluation Table.

CO₂ Emissions Strategies of Large Emitters

Case Studies in CEE.

Questionnaire

Contact:

Mag. Martin Eugen Wolf, MBA

Tel: +43 676 9389944

martin.wolf@energy-changes.com

Mgr. Laura Martonová, MSc

Tel: +421 911 299 822

email: laura.martonova@energy-changes.com

Prepared by: Energy Changes Holding s.r.o.

Respondent's Specification

Company :

--

Contact person on CO₂ issues/ETS:

Name:

Position:

Telephone:

Email:

A.) Investors Expectations

Objective: To understand investors' demands

1. Has your company been confronted with questions by (potential) shareholders / capital market partners on the implications of CO₂ / Climate Change to your business model?
 YES NO
2. Have (potential) capital market partners / investors demanded a specific CO₂/Climate Change Strategy?
 YES NO
3. Do you consider that your company will have to develop such a specific strategic approach, in order to continue to be able to participate in international capital markets?
 YES NO
4. Within which time frame will a CO₂ / Climate Change Strategy be a must for a listed company / to gain access to international capital markets?
 <1 year 1-2 years 3-5 years
5. Has your company yet received a "NON-Criteria Compliance" from a (large) institutional investor / Fond / Bank due to the lack of /insufficient CO₂ / Climate Change Strategy?
 YES NO

6. Does your company participate / intend to participate in such Supranational Projects as “Carbon Disclosure Project”?

- YES NO

Reasons for denial:

- Risk of Exposure of Company sensitive data to NGO’s and alike
- Complicated and Bureaucratic approach
- Methodology subject to constant change, high cost
- Lack of adequately trained professionals (multinational factories)

7. How well is your company in general terms prepared to meet the present and future demands by the international financial community in terms of CO₂ / Climate Change?

-     

B.) Risks and Opportunities

Objective: To identify strategic risks and opportunities and their implications.

Regulatory Risks:

1. Is your company exposed to regulatory risks related to CO₂ / climate change? Please specify.

Physical Risks:

2. Is your company exposed to physical risks from CO₂ / climate change? Please specify.

Other Risks:

3. Is your company exposed to other risks as a result of CO₂ / climate change? Please specify.

Regulatory Opportunities:

4. Do regulatory requirements on CO₂ / climate change present opportunities for your company? Please specify.

Physical Opportunities:

5. Do physical changes resulting from CO₂ / climate change present opportunities for your company? Please specify.

Other Opportunities:

6. Does CO₂ / climate change presents other opportunities for your company? Please specify.

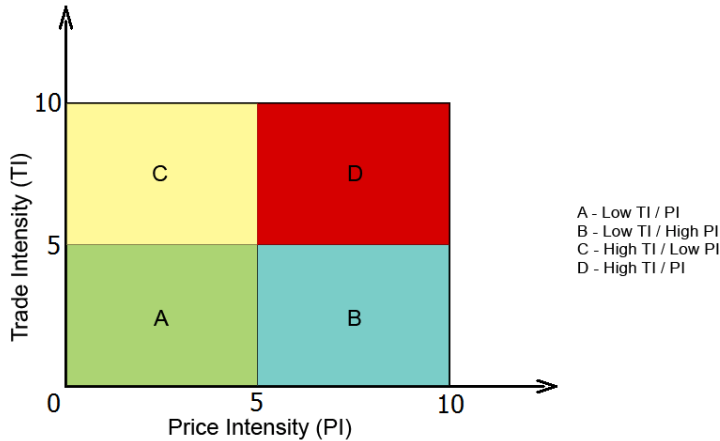
7. Summary of current and/or anticipated CO₂ / Climate Change risks/opportunities. Please specify.

8. In which way could the CO₂ / Climate Change risks/opportunities affect your **business model / value chain**? Please specify.

9. **Carbon leakage based on historic data (prior to 2008)**

Define the field in which you find your company using historic data (looking from today into the past)

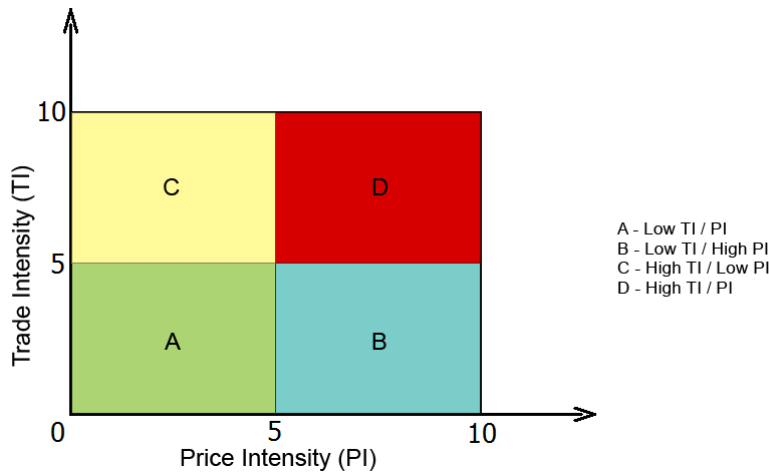
- A B C D



10. **Carbon leakage based on future expectations (post 2012 Scenario)**

Define the field in which you find your company using future expectations on the cost of CO₂ (e.g. €25/Ton).

- A B C D



11. Timescales over which the CO₂ / Climate Change risks/opportunities are expected to materialize.

- <1 year 1-2 years 3-5 years >5 years

12. Does your company have an institutionalized process for identifying CO₂ / Climate Change risks/opportunities and assessing the degree to which they could affect the business, including **the financial implications?**

- YES NO

13. Would you comment on actions the company has taken or plans to take to manage, adapt to and/or exploit the CO₂ / Climate Change risks / opportunities that have been identified?

14. Have your company's perceptions /views on CO₂ / Climate Change with the associated risks/opportunities changed in the past twelve months?

YES NO

If yes, then

to the better/less impact
 to the worse/more impact

C.) Greenhouse Gas (GHG) Emissions Accounting

Objective: To determine actual absolute GHG emissions.

1. Which share of the CO₂ Emissions of your industries segment does your company represent?

<5% 5-10% >10-15% >15-20% >20-25% > 25%

2. Does your Company have an Emission Accounting Procedure in place?

YES NO

3. a) Does this procedure cover in detail the different levels (Scope 1, Scope 2, Scope 3) of GHGs?

NO	YES	To which extent?	0-100	%
<input type="checkbox"/>	<input type="checkbox"/>	Scope 1 Direct GHG in CO ₂ -equivalent	...	%
<input type="checkbox"/>	<input type="checkbox"/>	Scope 2 Indirect GHG in CO ₂ - equivalent	...	%
<input type="checkbox"/>	<input type="checkbox"/>	Scope 3 Other Indirect GHG Emissions (distribution & logistics /in & out; use/disposal of company's products/services, business travel, etc)	...	%

3.b) Are the "Global Warming Potentials" and "Emission Factors" analyzed and calculated according to a defined methodology or Standard?

YES NO

4. Does the procedure & results have external verification?

- YES NO

If yes, then

- Within the general frame of ISO
 Contracted with external Supplier (e.g. TÜV, VERITAS, SGS, etc.)

5. EU Emission Trading Scheme:

Does your Company have facilities covered by the scheme?

- YES NO

If yes, then

- Operational Control
 Equity shares in facilities
 both

EU Allowances Phase 1 (2005-2007)

6. Were the EUAs (European Union Allowances) allocated to your company under the NAP-I (National Allocation Plan)

- Balanced out well
 Short
 Long

7. Has your Company quantified the profit / loss effect of the Certificates awarded under Phase 1?

- YES NO

8. Your comment on the order of magnitude of this effect

--

EU Allowances Phase 2 (2008-2012)

9. Were the EUAs (European Union Allowances) allocated to your company under the NAP-II

- Balanced out well
- Short
- Long

10. Has your Company quantified the profit / loss effect on the balance sheets 2008-2012 of the EUA's awarded under Phase 2?

- YES
- NO

11. Do you want to comment on the order of magnitude of this effect on the balance sheet 2008?

- YES
- NO

12. Does your company have an explicit strategy for participating in the EU ETS?

- YES
- NO

13. What is the expected impact of CO₂/Climate Change / EU ETS on your company's profitability?

- Not accounted for
- Very low
- Low
- substantial
- very substantial
- threatening

14. Emissions Trading Strategy developed?

- YES
- NO

15. Does your company intend to make use of the EU's (for SK 7%, for CZ 10 %, for AT 10%) SWAP Allowance? (Trade-in EUA's for CER's from CDM Projects).

- Yes, full use
- Partially, % use of Allowance
- NO

16. Emissions Trading Strategy is focused on:

- A Use and trading of allowances and project based emissions reduction credits (e.g. CDM & JI) for compliance with emission trading schemes
- B Generation of project-based credits
- C Trading of allowances and project-based offset emissions reduction credits as a profit making business activity or comparable (e.g. supporting an investment fund)

D.) Performance Objective:

To determine performance against targets and plans to reduce GHG emissions.

1. Does your company have a GHG emissions reduction plan in place?

- YES NO

2. Does this plan elaborate on Goal Setting; Plans & Activities & Investments; Goal Evaluation; Goal Achievement?

- Rudimental
- In early implementation
- Regular optimization
- Important management tool

3. In your opinion, how adequate is the present tool/methodology to fulfill its target?

- 0% 20% 40% 60% 80% 100%

4. Do you monitor the emissions intensity as a financial measurement for GHG (Scope 1 & Scope 2)?

- YES NO

5. Do you monitor the emissions intensity as an activity related measurement for GHG (Scope 1-3)?

- YES NO

6. Planning for future emissions being accounted for within your regular planning procedures?

- YES NO

7. How do you factor the cost of future emissions into capital expenditure planning?

8. Do these considerations have an impact on your investment decisions? Please, specify.

9. Is Carbon Capture and Storage (CCS) a viable alternative for CO₂ reduction in your present manufacturing and production set up?

YES NO

10. Have you been able to quantify the potential investment volume and the cost increase to your product if you employ CCS? Please, specify.

YES NO

Comment:

11. Has your Company decided to actively participate in establishing a CCS Project in industrial scale?

YES NO Under Consideration

E.) Governance Objective:

To determine responsibility and management approach to CO₂ /climate change.

Responsibility:

1. Does a Board Committee or other executive body have overall responsibility for CO₂/climate change management?

YES NO

2. If **not**, how is overall responsibility for climate change managed?

3. Which is the highest level within your company with responsibility for CO₂/climate change?

4. Which Board Committee member or other executive body member has overall responsibility for CO₂/climate change issues?

5. What is the period within which the Board or other executive body reviews the company's progress and status regarding CO₂/climate change?

- Month Quarter Trimester Semester Year Other

6. Has the importance / management attention provided at Board / Top Management to the "CO₂ / Climate Change Topic" seen any change within the past 12-18 months?

- YES NO

If yes, then:

- Moderate increase
 Substantial increase
 Key policy issue

7. Do you assess or provide incentive mechanisms for individual management of CO₂ / Climate change issues including attainment of GHG targets?

- YES NO Under Consideration In test Phase

F.) Individual Performance:

Objective: Understand the companies interface with stake holders.

1. Does your company support /actively encourage activities to neutralize its overall CO₂ footprint by engaging in the VER-Market (Voluntary Emissions Reductions)?

YES NO

If yes, then:

- Have implemented a plan to help neutralize the companies CO₂ footprint
 Only on a personal level by each employee
 Under consideration

Communications:

2. Do you publish information about the risks and opportunities presented to your company by CO₂ / climate change, details of your emissions and plans to reduce emissions?

YES NO

If yes, then:

- Annual Report or other mainstream filings, and/or
 Formal communications with shareholders or external parties, and/or
 Voluntary communications such as Corporate Social Responsibility Reporting
 Other

3. **Internet / Corporate Web-Page:**

Is the subject of CO₂ / Climate Change and your company's involvement in it on your web page:

- Underrepresented
 Need to be reviewed
 In good relation to its importance
 Overrepresented

Public Policy:

4. Do you regard the EU's Policy and targets on the subject of CO₂ / Climate Change in response to the magnitude of the challenge?

- Fully inadequate in terms of Cost to Benefits
 In principle in the right direction but needs fine tuning
 Adequate to the objectives and targets, needs a consensus on international basis
 The Cost per CO₂ ton is too low and the allocation procedures ineffective / inefficient

5. Do you engage with policymakers (Local / National / EU) on possible responses to CO₂ / Climate Change including taxation, regulation and carbon trading?

- YES NO

6. Primarily we do so through:

- A Industry Association
 B Direct Political Lobbying on Local / National Level
 C Direct Support for EU Lobbying Activities

7. Industry Associations

In your company's opinion are the CO₂ / Climate Change Activities as implemented at present by your sector / national industry association:

- Fully inadequate as they do not show the real costs & risks to enterprises to the public / decision makers
 Need improvement in terms of more focus on the international competition
 In general correct and coordinated with other relevant sectors
 Good, are helping to avoid an excessive burden to the industry
 Very good, have achieved some substantial results on national / EU level

General Information:

To which sector does your organization belong?

- 1 Utilities - Electricity Generation
 2 Steel / Metal
 3 Refractory / Ceramic / Mining
 4 Petrochemicals
 5 Paper / Cardboard / Pulp
 6 Cement / Lime
 7 Industry with Large Energy Consumption
 8 Association of Industry / Lobbying Group
 9 District heating supplier (heat/hot water/steam)

G.) PERSONAL OPINIONS & POINTS of VIEW

A.) How do you view the present public discussion on Climate Change?

B.) Is Climate Change a phenomenon on which human society has an option to reduce it / roll it back?

C.) Is the amount of resources being spent today and planned for the future adequate for the expected magnitude of the challenge?

D.) Are the expected Mitigation and Avoidance costs (2-5% of GDP) a wise investment?

E.) Does the present generation have the obligation to leave to the following generations a world climate at a "1990 Kyoto Reference Level" or better?

F.) Does the present 2010-generation in EU/USA/JPN have the moral right to spend for the ecological well being of its 2050-generation, by neglecting on the opportunities and even on the right of existence of the 2020-Generation in e.g Sub-Saharan Africa?

G.) Have **you** actually changed or intend to change your present life style in order to contribute to reduce CO₂ / Climate Change?

- Reduced energy consumption (electricity / heating energy)
- Reduced / Changed means of transportation (Public transportation / car)
- Other measures. Please, specify

THANK YOU !

ÖSTERREICH

Has your company been confronted with questions by (potential) shareholders / capital market partners on the implications of CO2 / Climate Change to your business model?

A1

Interview 1

YES

POINTS

1

Interview 2

YES

POINTS

1

Interview 3

YES

POINTS

1

Interview 4

YES

POINTS

1

Interview 5

YES

POINTS

1

Interview 6

YES

POINTS

1

Interview 7

YES

POINTS

1

Interview 8

YES

POINTS

1

Interview 9

YES

POINTS

1

Interview 10	NO
POINTS	0

Have (potential) capital market partners / investors demanded a specific CO2 /Climate Change Strategy?

Do you consider that your company will have to develop such a specific strategic approach, in order to continue to be able to participate in international capital markets?

A2

A3

NO

0

0

YES

YES

1

1

YES

YES

1

1

NO

NO

0

0

YES

YES

1

1

NO

NO

0

0

NO

YES

0

1

YES

YES

1

1

YES

NO

1

0

Within which time frame will a CO2 / Climate Change Strategy be a must for a listed company / to gain access to international capital markets?

Has your company yet received a "NON-Criteria Compliance" from a (large) institutional investor / Fond / Bank due to the lack of /insufficient CO2 / Climate Change Strategy?

A4

A5

3-5 YEARS

NO

1

0

1-2 YEARS

NO

2

0

<1 YEAR

NO

3

0

3-5 YEARS

NO

1

0

<1YEAR

NO

3

0

3-5 YEARS

NO

1

0

<1YEAR

NO

3

0

1-2 YEARS

NO

2

0

3-5 YEARS

NO

1

0

<1 YEAR

NO

3	0
---	---

3	0
---	---

Does your company participate / intend to participate in such Supranational Projects as "Carbon Disclosure Project"	How well is your company in general terms prepared to meet the present and future demands by the international financial community in terms of CO2 / Climate Change?
A6	A7
NO	D
0	3
NO / RISK OF EXPOSURE/COMPLICATED/METHODOLOGY SUBJECT	D
2	3
YES	E
3	3
NO	E
1	3
NO/RISK OF EXPOSURE	E
2	3
NO	E
1	3
YES	E
1	3
YES	E
1	3
YES	E
3	3

Is your company exposed to regulatory risks related to CO2 / climate change? Please, specify.

Is your company exposed to physical risks from CO2 / climate change? Please, specify.

B1

B2

several legal framework concerning emission trading, energy efficiency, use of renewables

weather conditions influence both supply side as well as demand side

3

3

Without a clear legal frame for the post 2012 period, investment are difficult to define.
Essential will be the rules the allocation for CHP's

NO

3

1

Yes. Uncertainty for investments in the Post Kyoto 2012 period. End of

2008 receiving first positive information from governments. Previously investment stop for expansion/modernization of manufacturing locations in EU.

Carbon Leakage must be considered. At present in our industry regulatory risks are equal to financial risks. CO2 Management is centralized in Paris HQ

Not in Austria, Globally yes due to presence in 76 countries.

Details available in the Corporate Sustainability Report on the corporate homepage

3

3

YES. Due to lack of regulatory issues in EU from 2013 onwards

NO

3

1

No decisions yet for the post 2012 period.
Need a clear framework in which to act

NO

3

1

YES. Lack of Post-kyoto 2012 regulations.
Specific political issues in Austria. Interference by local authorities

NO

3

1

YES. Uncertainty in legal environment. Kohlekraftwerk Beteiligung gemeinsam mit EVONIK. Risk is the Post 2012 development.

NO / Very Limited

3

3

YES. Post 2012 regulations will be essential

NO. Direct immediate concern

3

3

Yes, VERBUND is investing in thermal power generation and is therefore substantially exposed to regulatory CO2 risks.

Yes, regarding the water flow VERBUND is definitely exposed to physical risks of climate change but the risks are balanced according to a recent study made by VERBUND. (less water flow in summer because of higher temperatures, but more water fall in winter because of less cold temperatures).

3

3

Is your company exposed to other risks as a result of CO2 / climate change? Please, specify.	Do regulatory requirements on CO2 / climate change present opportunities for your company? Please, specify.
B3	B4
	<p>mobility is heading towards a bigger demand on power for electric vehicle, hybrids etc.</p> <p>energy efficiency measures often are linked to a higher consumption of electricity (e.g. ventilation in zero emission buildings)</p>
0	3
<p>Due to changes in the EU's CAP we have lost the possibility for experts and will have to cope with larger import shares to our market</p>	NO
3	1
<p>CO2 Cost must be comparable within the EU and outside of the EU.</p> <p>"Level Playing Field" essential for CO2 Climate Change as well as other environmental issues</p>	<p>The Lafarge Group has embraced CO2 as an opportunity. Already defined early 2000 specific internal targets.1990 Reference year/2010 target</p> <p>year: minus 20% Co2per ton. Actually achieved per end 2007: minus 14%.</p> <p>Cooperaton with WWF.</p> <p>In future modern Process vs.outdated process. In USA still mostly old fshioned kilms (Naßöfen)</p>
3	3
<p>Due to the lack of regulation for postkyoto 2012, the competitive situation in the market place is unclear</p>	<p>YES. It is possible that post 2012 regime will not consider anymore emitters of our side. This would facilitate the issue</p>
3	3
<p>If the present declaration of intentions are made into foraml policy, the energy intensive industries will move out of EU. This will largely reduce our customer platform in Europe</p>	<p>YES. Further explotation of reduction potential. Will provide impulses for innovation</p>
3	3
<p>Speculative elements in the CO2 pricing and systematik. Market very intransparent</p>	<p>YES/IT FORCES INNOVATION</p>
3	3
<p>Risks and benefits balance out</p>	<p>EVN has a very modern and good mix in the generators. Using KWK/GUD's, Windenergy, Only 1 Coal power plant. CO2 emmissions perMWel * MWth</p>
3	3
<p>Emissions trading always has an impact on P&L. Long term risk due to carbon leakage. Financial burden due to windfall profits for utilities, impacting P&L.</p>	<p>YES. The development of new products with higher energy efficiency will require also new + more plastics</p>
3	3
<p>Yes, financial risks resulting from the conceptualization of auctioning of EUAs from 2013 onwards. The auctions should be mainly designed for hedging and not be a playing field for speculators only.</p>	<p>Yes, CO2-free power generation (VERBUND is mainly a hydro power producer) becomes more & more a substantial competitive advantage. And thats exactly the way it should be in order to stimulate investments in environmentally-friendly technologies.</p>
3	3

Do physical changes resulting from CO2 / climate change present opportunities for your company? Please, specify.	Does CO2 / climate change presents other opportunities for your company? Please specify.
B5	B6

0	0
---	---

Size and sugar content of the beets is due to increase, also the sugar beet growing could expand.	NO
---	----

3	1
---	---

YES. Large infrastructure buildings and investments must use cement as a prime raw material	Heating and cooling with concrete promises to develop into an interesting business opportunity
---	--

3	3
---	---

NO	NO
----	----

1	1
---	---

NO	The availability of new technologies for energy production will provide for a departure from fossile fuels. New final products wit enhanced properties will developpe and demand new refractories materials solutions
----	---

1	3
---	---

Rising temperatures will allow for a longer building season in the alpine areas. Consumers more aware of the need for insulation etc	NO
--	----

3	1
---	---

NO. Small geographic radius of activity for the largest share of the revenues	NO. In general terms we believe the phyiscal changes to be relatively small.
---	--

3	3
---	---

YES	NEW PRODUCTS, NEW DEMANDS ON LCA'S
-----	------------------------------------

3	3
---	---

NO	NO
----	----

1	1
---	---

Summary of current and/or anticipated CO2 / Climate Change risks/opportunities. Please, specify.	In which way could the CO2 / Climate Change risks/opportunities affect your business model/ value chain. Please, specify.
B7	B8

0	0
---	---

The allocation of carbon credits to CHP is the critical issue for the sugar industry	Without allocation of a reasonable level of FOC CO2 Credits the industry will probably start to shut down the older CHP's and take the power from the grid.
--	---

3	3
---	---

Participation in international projects: CSI: Cement Sustainable Institute, WBCSD: World Business Council of Sustainable Development	The cement industry has 3 critical ratios to be taken care of: A: CK-Ratio (Cement of Klinker), B: Energy Efficiency; C: Alternative Energy Supply. To all combustibles the CO2 Cost are automatically added. This results in a very high cost for coal as an energy base for the industry. Lafarge has the largest research centre in the industry in Lyon. CO2 & Climate Change is a clear opportunity for Lafarge
--	--

3	3
---	---

Lack of regulations for post 2012. Growing uncertainty	Delay of investments
--	----------------------

3	3
---	---

CO2 charges have a very high impact for our industry, comparable only with Cement/Lime, as we have a comparable process	An ill managed carbon leakage issue will lead to an exodus from EU. New rawmaterial sites already being exploited in Turkey, Brazil and China with NO CO2 constraints. Significant cost increases in the logistical chain
---	---

3	3
---	---

The climate Change issue in its present stage resembles rather hype, comparable with Acid rain/woods. After some 10 years the issue went quietly away	The negative aspects due to the speculative character of the CO2 Markets, make investment decisions difficult and shorten time horizons for project pay back periods
---	--

3	3
---	---

Only issue would be change in Insurance policies.	The Carbon leakage effect that could lead to the exodus of some large energy consumers. Generator mix is under detailed analysis (CO2 Emission per MWe & MWh) Use of KWK/GUD's. Management of CO2 balance
---	---

3	3
---	---

	CO2 AS COST ELEMENT WILL PROVIDE INCENTIVES FOR IMPROVED PRODUCTS.
--	--

0	3
---	---

SEE Q4	Focus of VERBUND will remain on renewables; Gas will be the main fuel for thermal power plants to be built by VERBUND until 2020.
--------	---

0	3
---	---

Carbon leakage based on historic data (prior to 2008)
Define the field in which you find your company using
historic data (looking from today into the past)

B9

Carbon leakage based on future expectations (post
2012 Scenario)
Define the field in which you find your company
using future expectations on the cost of CO2 (e.g. €
25/Ton).

B10

0	0
---	---

A

D

3	1
---	---

A

D

3	1
---	---

D

D

1	1
---	---

D

D

1	1
---	---

B

D

2	1
---	---

A

A

3	3
---	---

D

D

1	1
---	---

C

C

2	2
---	---

Timescales over which the CO2 / Climate Change risks/opportunities are expected to materialise.

Does your company have an institutionalized process for identifying CO2 / Climate Change risks/opportunities and assessing the degree to which they could affect the business, including the financial implications?

B11

B12

3-5 YEARS

NO

1

0

3-5 YEARS

NO

1

0

3-5 YEARS

YES

1

1

3-5 YEARS

NO

1

0

>5 YEARS

YES

0

1

>5 YEARS

YES

0

1

>5 YEARS

YES

0

1

1-2 YEARS

YES

2

1

<1 YEAR

YES

3

1

Would you comment on actions the company has taken or plans to take to manage, adapt to and/or exploit the CO2 / Climate Change risks / opportunities that have been identified?	Have your company's perceptions /views on CO2 / Climate Change with the associated risks/opportunities changed in the past twelve months.	If yes, then:
B13	B14a	B14b
	NO	
0	0	0
NO	NO	
1	0	0
YES	NO	
3	0	0
NO	YES	TO THE WORSE/MORE IMPACT
1	1	2
YES	YES	TO THE WORSE/MORE IMPACT
3	1	2
YES	YES	TO THE WORSE/MORE IMPACT
3	1	2
YES	NO	
3	0	0
YES	NO	
3	0	0
YES	NO	
3	0	0

YES

YES

TO THE WORSE/MORE IMPACT

3

1

2

Which share of the CO2 Emissions of your industries segment does your company represent?	Does your Company have an Emission Accounting Procedure in place?	Does this procedure cover in detail the different levels (Scope 1, Scope 2, Scope 3) of GHGs?
C1	C2	C3a
<5%	YES	SCOPE1
1	1	1
>20-25%	YES	SCOPE 1 / SCOPE 2
3	1	2
>20-25%	YES	SCOPE 1 / SCOPE 2
3	1	2
<5%	YES	SCOPE 1
1	1	1
>25%	YES	SCOPE 1
3	1	1
5-10%	YES	SCOPE 1 / SCOPE 3
1	1	2
5-10%	YES	SCOPE 1 / SCOPE 2
1	1	2
	YES	SCOPE 1 / SCOPE 2
0	1	2
10-15%	YES	SCOPE 1
2	1	1

20-25%

YES

SCOPE 1

3	1	1
---	---	---

Are the "Global Warming Potentials" and "Emission Factors" analyzed and calculated according to a defined methodology or Standard?	Does the procedure & results have external verification?	If yes, then
C3b	C4a	C4b

YES

YES

EXTERNAL SUPPLIER

1	1	2
---	---	---

YES

YES

EXTERNAL SUPPLIER

1	1	2
---	---	---

YES

YES

EXTERNAL SUPPLIER

1	1	2
---	---	---

YES

YES

EXTERNAL SUPPLIER

1	1	2
---	---	---

YES

YES

EXTERNAL SUPPLIER

1	1	2
---	---	---

YES

YES

EXTERNAL SUPPLIER

1	1	2
---	---	---

YES

YES

EXTERNAL SUPPLIER

1	1	2
---	---	---

YES

YES

EXTERNAL SUPPLIER

1	1	2
---	---	---

YES

YES

GENERAL FRAME OF
ISO / EXTERNAL
SUPPLIER

1	1	2
---	---	---

EU Emission Trading Scheme:
Does your Company have facilities covered by the
scheme?

Did the EUAs (European Union Allowances)
provided for your company under the NAP-I
(National
Allocation Plan) ...

C5

C6

YES/BOTH

LONG

1

1

YES/BOTH

BALANCED OUT WELL

1

3

YES/OPERATIONAL CONTROL

SHORT

1

2

YES/OPERATIONAL CONTROL

LONG

1

1

YES/BOTH

LONG

1

1

YES/BOTH

BALANCED OUT WELL

1

3

YES/BOTH

SHORT

1

2

YES

BALANCED OUT WELL

1

3

YES/BOTH

SHORT

1

2

Has your Company quantified the profit / loss effect of the allowances awarded under Phase 1?

Your comment on the order of magnitude of this effect

C7

C8

YES

MINIMAL

1

1

YES

NO

1

0

YES

VERY LOW/ALMOST 0

1

1

YES

A loss of € 42.000 as we bought unnecessary certificates

1

1

YES

Initially we have not paid sufficient attention to this issue, corrected later. The effect ws very moderate

1

1

YES

Only a very small amount of certificates have been traded

1

1

YES

Data can be calculated from the annual Report. No further comment.

1

1

YES

NO

1

0

YES

1

0

YES

NO COMMENT

1	0
---	---

0

Did the EUAs (European Union Allowances) provided for your company under the NAP-II (National Allocation Plan) ...

Has your Company quantified the profit / loss effect on the balance sheets 2008-2012 of the EUA's awarded under Phase 2?

C9

C10

SHORT

NO

2

0

BALANCED OUT WELL

YES

3

1

SHORT

YES

2

1

SHORT

YES

2

1

SHORT

YES

2

1

BALANCED OUT WELL

NO

3

0

BALANCED OUT WELL

YES

3

1

BALANCED OUT WELL

YES

3

1

SHORT

YES

2

1

Do you want to comment on the order of magnitude of this effect on the balance sheet 2008?

Does your company have an explicit strategy for participating in the EU ETS?

C11

C12

NO

YES

0

1

NO

YES

0

1

YES / 5,5 Mill Euro, 250.000 Certificates.

In 2009 it will be potentially lower. CO2 prices will be lower and possibly also the production volume

YES

1

1

Loss of € 42.000 as we bought unnecessary certificates

YES

1

1

YES / within the range of € 1,5 Mill p.a on P&L Level
(CO 2 Price levels Mid 2008)

YES

1

1

NO

YES

0

1

YES / The effect on the P&L 2008 will be able to be sent from the Annual Report 2008 once published. For 2009 and following years almost impossible to tell due to the uncertainties in the present economic crisis.

YES

1

1

NO

YES

0

1

YES

0

1

What is the expected impact of CO2/Climate Change / EU ETS on your company's profitability?

Emissions Trading Strategy developed?

C13

C14

SUBSTANTIAL

YES

3

1

VERY SUBSTANTIAL

YES

3

1

THREATENING

YES

3

1

LOW

YES

1

1

LOW

NO

1

0

SUBSTANTIAL

YES

3

1

VERY LOW

YES

1

1

YES

0

1

SUBSTANTIAL

YES

2

1

SUBSTANTIAL

YES

2	1

Does your company intend to make use of the EU's (for SK 7%, for CZ 10 %, for AT 10%) SWAP Allowance? (Trade-in EUA's for CER's from CDM Projects).

Emissions Trading Strategy is focused on:

C15	C16
YESS/FULL USE	B
3	1
NO	C
2	0
YESS/FULL USE	A
3	1
NO	A
1	1
YES/FULL USE	A/B
3	1
YES/FULL USE	A
3	1
YES/FULL USE	A/B
3	1
YESS/FULL USE	A
3	1
YES/FULL USE	A/B/C
3	3

Does your company have a GHG emissions reduction plan in place?

Does this plan elaborate on Goal Setting; Plans & Activities & Investments; Goal Evaluation; Goal Achievement?

D1

D2

0

0

YES

REGULAR OPTIMIZATION

1

2

YES

IMPORTANT MANAGEMENT TOOL

1

1

YES

REGULAR OPTIMIZATION

1

2

YES

IMPORTANT MANAGEMENT TOOL

1

1

YES

IMPORTANT MANAGEMENT TOOL

1

1

YES

REGULAR OPTIMIZATION

1

2

YES

REGULAR OPTIMIZATION

1

2

YES

REGULAR OPTIMIZATION

1

2

In your opinion, how adequate is the present tool/methodology to fulfill its target?

Do you monitor the emissions intensity as a financial measurement for GHG (Scope 1 & Scope 2)?

D3

D4

0

0

100%

YES

3

1

100%

YES

3

1

100%

NO

3

0

80%

YES

3

1

60%

YES

2

1

100%

NO

3

0

NO

0

0

60%

YES

2

1

Do you monitor the emissions intensity as an activity related measurement for GHG (Scope 1-3)?

Planning for future emissions being accounted for within your regular planning procedures?

D5

D6

0

0

NO

YES

0

1

YES

YES

1

1

NO

YES

0

1

YES

YES

1

1

YES

1

1

YES

YES

1

1

YES

YES

1

1

YES

YES

1

1

NO

YES

0	1
---	---

0	1
---	---

How do you factor the cost of future emissions into capital expenditure planning?	Do these considerations have an impact on your investment decisions? Please, specify.
D7	D8

0	0
---	---

Assumed CO2 cost as standard cost line in the investent planing procedure The future viability of the typical CHP's used in our industry is uncertain.

1	3
---	---

CO2 is defined as a varaible cost, full represented in the P&L Account at product/plant level. CAPEX & OPEX YES. Clearly some investments have been deferred

3	3
---	---

A NEGESTIBLE AMOUNT

Only after clear definition of NAP3 will we continue the palning for the renewal of our heating Units in the paper mill

3	3
---	---

CO2 calculated as a varaible cost (€ 20 per ton

Very high impact as due to the process we are very large emitters

3	3
---	---

as a variable cost at € 20/ton

Reduce the pay back periods which are allowed for break even

3	3
---	---

CO2 calculated as a varaible cost. At actual prices as quoted on the CO2 Stock Exchange for the same period as the investment is being planned.

YES. CO2 prices are build into future expectations. In our business very long time horizons for strategic invetment.

3	3
---	---

CONTINUOS FORECAST. ENERGY AND CO2 ARE INCLUDED AS VARIABLE COST.

YES. DIRECT IMPACT TO THE P&L

3	3
---	---

100%

Yes, costs of carbon are one of the key costs of thermal power generation.

1	3
---	---

Is Carbon Capture and Storage (CCS) a viable alternative for CO2 reduction in your present manufacturing and production set up?

Have you been able to quantify the potential investment volume and the cost increase to your product if you employ CCS? Please, specify.

D9

D10

0

0

NO

NO

0

0

NO

NO / is not a viable technical Option for Cement/lime kilms

0

3

NO

NO

0

1

NO

NO

0

1

NO

NO

0

1

NO

NO/We do have an intensive information exchange with Vattenfall in the Project "Schwarze Pumpe" / CSS Pilot plant

0

3

YES

YES

1

1

NO

NO

0

1

Has your Company decided to actively participate in establishing a CCS Project in industrial scale?	Does a Board Committee or other executive body have overall responsibility for CO2/climate change management?
D11	E1
	NO
0	0
NO	NO
0	0
NO	YES
0	1
NO	YES
0	1
NO	YES
0	1
NO	YES
0	1
YES	NO
2	0
YES	YES
2	1
UNDER CONSIDERATION	YES
1	1

NO	YES
0	1

If NOT, how is overall responsibility for climate change managed?

Which is the highest level within your company with responsibility for CO2/climate change?

E2

E3

IN THE BRANCHES WHO ARE EXPOSED MOST TO CLIMATE CHANGE

HEAD OF UNIT

1

1

Legal and regulatory issues at level Department Management;
CO2 dealing at Division Management level

DIVISION

3

1

EXECUTIVE BOARD / DAILY BUSINESS

0

3

BOARD

0

3

CEO

0

3

CEO

0

3

Umweltcontrolling, Abteilung Energiewirtschaft / Geschäftsfeldeinheiten. Level 2 & Level 3

Level 2 Geschäftsfeldeinheiten

3

2

DEPUTY CEO

0

3

CEO/CFO

0

3

Which Board Committee member or other executive body member has overall responsibility for CO2/climate change issues?

What is the period within which the Board or other executive body reviews the company's progress and status regarding CO2/climate change?

E4

E5

0

0

2 different members of the Executive board (Vorstand)

YEAR

1

1

CORPORATE BOARD LEVEL

MONTH

3

3

CTO:for daily business descisions on CO2 Complete Board for the overall topic Climate Change & Corrugated cardboard

MONTH

3

3

CEO AND BOARD / ESSENTIAL ISSUE FOR OUR INDUSTRY

MONTH

3

3

CEO AND BOARD

MONTH

3

3

BOARD OF DIRECTORS OF EVN AG FOR OVERALL STRATEGIES (INCLUDING CO2). BOARD MEMBER "KRAFTWERK" FOR CCS, CERTIFICATES.

MONTH

3

3

DEPUTY CEO

TRIMESTER

3

2

SEE Q3

YEAR

0

1

Has the importance / management attention provided at Board / Top Management to the "CO2 / Climate Change Topic" seen any change within the past 12-18 months?	If yes, then:	Do you assess or provide incentive mechanisms for individual management of CO2 / Climate change issues including attainment of GHG targets?
E6a	E6b	E7
NO	NO	
0	0	0
YES	KEY POLICY ISSUE	NO
0	3	0
YES	KEY POLICY ISSUE	YES
0	3	3
YES	MODERATE INCREASE	NO
1	1	0
YES	KEY POLICY ISSUE	YES
1	3	3
YES	KEY POLICY ISSUE	YES
1	3	3
YES	KEY POLICY ISSUE	NO
1	3	0
YES	KEY POLICY ISSUE	YES
1	3	3
NO	UNDER CONSIDERATION	
0	0	1

Does your company support /actively encourage activities to neutralize its overall CO2 footprint by engaging in the VER-Market (Voluntary Emissions Reductions)?	If yes, then:	Do you publish information about the risks and opportunities presented to your company by CO2 / climate change, details of your emissions and plans to reduce emissions?	If yes, then:
INDI 1 a	INDI 1b	INDI 2a	INDI 2b
YES			
1	0	0	0
NO		YES	ANNUAL REPORT
0	0	1	1
NO		YES	ANNUAL REPORT
0	0	1	1
NO		YES	OTHER
0	0	1	0
NO		YES	ANNUAL REPORT / FORMAL COMMUNICATIONS
0	0	1	2
NO		NO	
0	0	0	0
NO		YES	ANNUAL REPORT
0	0	1	1
YES		YES	ANNUAL REPORT
1	0	1	1
NO		YES	ANNUAL REPORT
0	0	1	1

Internet / Corporate Web-Page:
Is the subject of CO2 / Climate Change and your
company's involvement in it on your web page:

Do you regard the EU's Policy and targets on the subject
of CO2 / Climate Change in response to the magnitude of
the challenge?

INDI 3

INDI 4

IN GOOD RELATION

NEEDS FINE TUNNING

2

1

UNDERREPRESENTED

FULLY INADEQUATE

0

0

UNDERREPRESENTED

NEEDS FINE TUNNING

0

1

UNDERREPRESENTED

ADEQUATE

0

2

UNDERREPRESENTED

FULLY INADEQUATE

0

0

UNDERREPRESENTED

FULLY INADEQUATE

0

0

IN GOOD RELATION

NEEDS FINE TUNNING/ADEQUATE

2

2

IN GOOD RELATION

ADEQUATE

2

2

NEEDS TO BE REVIEWED

ADEQUATE

1

2

IN GOOD RELATION

THE COST PER CO2 TONN IS TOO LOW

2	3

Do you engage with policymakers (Local / National / EU) on possible responses to CO2 / Climate Change including taxation, regulation and carbon trading?

Primarily we do so through

INDI 5

INDI 6

YES

B/DIRECT POLITICAL LOBBYING

1

2

YES

A/INDUSTRY ASSOCIATION B/DIRECT POLITICAL LOBBYING C/DIRECT SUPPORT FOR EU

1

3

YES

A/INDUSTRY ASSOCIATION B/DIRECT POLITICAL LOBBYING C/DIRECT SUPPORT FOR EU

1

3

YES

A/INDUSTRY ASSOCIATION

1

1

YES

A/B/C

1

3

YES

A/B/C

1

3

YES

A/INDUSTRY ASSOCIATION

1

1

YES

A/INDUSTRY ASSOCIATION

1

1

YES

A/B/C/

1

3

Industry Associations In your company's opinion are the CO2 / Climate Change Activities as implemented at present by your sector / national industry association	TOTAL POINTS AVAILABLE	TOTAL POINTS ACHIEVED	SCORE
INDI 7			
IN GENERAL CORRECT			
2	149	48	32,21%
VERY GOOD			
3	149	90	60,40%
VERY GOOD			
3	149	116	77,85%
VERY GOOD			
3	149	85	57,05%
IN GENERAL CORRECT			
2	149	104	69,80%
VERY GOOD			
3	149	100	67,11%
IN GENERAL CORRECT			
2	149	112	75,17%
GOOD			
2	149	102	68,46%
IN GENERAL CORRECT			
2	149	93	62,42%

