

## Winners and Losers in a Low Carbon Economy: A Look at Innovest's Carbon Beta™

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Center for  
BUSINESS AND THE ENVIRONMENT  
*at Yale*

## Chapter 12

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*Mario López-Alcalá and Hiroshi Minami, Innovest Strategic Value Advisors*

### EDITORS' REMARKS

Mario López-Alcalá and Hiroshi Minami joined us from the Manhattan office of Innovest to present their research product, “Carbon Beta,” which is an analytical platform designed to provide “a comprehensive analysis of corporate risk and performance.” While most other chapters discuss, at some point, the emergence of climate change “winners” and “losers” and the importance of carbon issues to company performance, this chapter’s primary aim is to introduce a methodology for characterizing and quantifying these companies and issues.

The main thesis of their approach is that “the integration of sustainability and finance helps us identify these intangible sources of risk and value, which are not fully captured by traditional accounting and finance methods.” After Mr. Minami sets the context, Mr. López-Alcalá explains the drivers and logic of these “intangible sources”, the methods for identifying them, and the limitations of less complex, one-dimensional analyses. The whole value chain is within their scope, and while there are general points to be pulled from this discussion, technical details are also expounded upon. Some of their central findings are that “variability is wide between and within industry sectors, and yet these exposures are not fully priced into asset values”, and that, in spite of this and the difficulty in sometimes obtaining robust data, the “carbon leaders” are starting to outpace the “carbon laggards” as awareness of climate change issues and regulation increases.

Mr. Minami finishes the presentation with a case study of the electronic equipment and instrument sector, illustrating some details about their research methodology. And, although this chapter concludes, as always, with a question and answer session with our audience, the conversation that day went on for a good while after the Yale University Netcast team had stopped their recording equipment.\*

\* To gain further context, read related articles, order a bound copy of this publication, or download pdfs of the publication or the recorded version of this presentation, please visit: [www.yale.edu/cbey/carbonfinance2008](http://www.yale.edu/cbey/carbonfinance2008)

**Hiroshi Minami**

Good afternoon. My name is Hiroshi Minami. I graduated from Yale University almost seven years ago, in 2001, and the last time I visited New Haven was several years ago so I'm very happy to be here today.

I want to say thank you to the Center for Business and the Environment at Yale for having us here. We are very glad to have this opportunity to present our research and our research product. First we'd like to go through an overview of Innovest – what we are doing, how big our company is, and where we are located. Mario will then present our Carbon Beta research product. Lastly, I'm going to show you some case studies.

**CONTEXT**

Let me start by giving a very brief introduction to Innovest. We are an investment research company in the environmental, social, and governance areas (ESG). That's our specialty. Based on our research, we do some consulting work and also asset management sub-advisory services. We have approximately 80 analysts worldwide. This is the largest analyst team in the world in the ESG area, as far as I know. We cover more than 60 industry sectors and almost 2,300 companies globally, including U.S., Japanese, and European companies, and also some other Asian companies and companies in emerging markets. We have offices in New York, Toronto, London, Paris, Sydney, Tokyo, and San Francisco. New York and Toronto are the largest offices.

We provide our research primarily to institutional investors, and approximately \$1.3 billion is under our sub-advisory mandates. Eight of the top twenty-five global asset managers in the world use Innovest research. Our key clients are major institutional investors like UBS, HSBC, ABN Amro, State Street, ABP, BNP Paribas, and CalPERS.

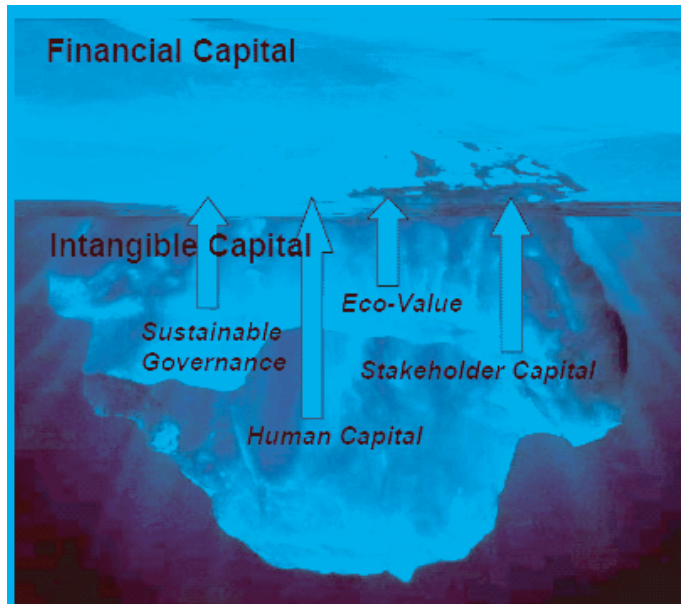
Why are we doing research for investors in the ESG area? This is what we call "iceberg balance sheet" investing (see Figure 1). Above the surface you see an iceberg, and that's measured by traditional financial analysis. However, underneath the surface, we have more intangible values that have not been evaluated by anyone, which include governance, environmental, human capital, and stakeholder issues. Carbon issues are becoming more and more important recently and have started affecting the financial capital of companies.

We have several major research products. One is called Intangible Value Assessment™, or IVA. This is our core product. It's a comprehensive industry and company analysis of the ESG space. But today we're not going to present IVA, we're going to present Carbon Beta™. Carbon Beta is a comprehensive analysis of corporate carbon risk and performance. A third product is the Global Compact Screen and Activity Screen. Some of our clients want this type of information – research on a company's involvement in certain activities such as weapons production, tobacco, or alcohol. We do this kind of research too. All of these research products are available through our web site called Innovest "i-rating"<sup>1</sup>

I'm going to now pass the podium over to Mario to present Carbon Beta.

<sup>1</sup> <http://iratings.innovestgroup.com>

Figure 1 Iceberg balance sheet



Source: Innovest

**Mario López-Alcalá**

## **CARBON BETA**

Thank you, Hiroshi. And thank you to the Center for Business and the Environment at Yale for the invitation from Bryan Garcia and Eric Roberts.

### **Drivers and logic**

I would like to introduce our analytical platform called Carbon Beta. In the words of the Chief Executive of the Carbon Trust, Tom Delay, “There will be large creation and distribution of shareholder value in the transition to a low carbon economy. There will be winners and losers, with the winners more likely to be those businesses that take time to understand and address this complex area.”<sup>2</sup>

<sup>2</sup> Climate Change and Shareholder Value, Carbon Trust (March 2006)

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What are the drivers? Climate change has several different drivers that become the logic for investors to consider and that also drive global industrial restructuring.

These drivers include regulation, litigation, competitiveness issues, and reputation problems that companies might face. The consequences of all of these issues are going to impact the investments and, of course, the normal course of operations for a business. Each of these drivers can affect operating costs and different performance metrics within the various industry sectors and businesses.

What is the logic for investors to invest in these sectors or companies? The logic for investors, as Hiroshi mentioned, is that the sustainability characteristics of companies are becoming increasingly critical to their competitiveness, profitability, and ultimately their share price. The sustainability analyses that we perform can provide additional insights about a company's strategic management capabilities, organizational agility, and ultimately their financial performance potential. By these additional insights, I mean that the integration of sustainability and finance helps us identify these intangible sources of risk and value, which are not fully captured by traditional accounting and finance methods.

At Innovest we have been doing research on carbon for the last seven years. What we have learned so far is that climate change is emerging and is already the number one sustainability risk driver for global industrial restructuring toward a low carbon future. Carbon risks are much more broadly and unevenly distributed than previously thought.

While more and more investors and corporations are now paying attention, most of them are a long way from integrating the net climate exposure of their assets into actual investment strategies. In this sense, awareness and action do not go hand in hand. Maybe a lot of you are aware of the McKinsey quarterly survey, which indicates that executives view climate change issues as important for companies, seeing both opportunity and risk. However, we have found that what companies say and what they actually do are not necessarily the same, and awareness alone makes very little difference regarding the terms of their actual performance.

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What drives a company's Carbon Beta? Strategic governance drives the extent to which companies integrate climate change factors into their business planning and overall risk assessment. There are some sectors for which this is not necessary because companies in those sectors, or those sectors specifically, don't deal that much with climate issues, but there are other sectors for which it is core to their business.

The Carbon Beta of a company depends on their products as well – be they direct, indirect, or embedded carbon intensities. That is, the whole value chain emissions

profile of a product matters – the energy intensity of the company’s operations, the consumption patterns, and the electricity source mix utilized. If the electricity source is a coal plant, for example, it’s likely that the Carbon Beta rating will increase, but if the electricity source is nuclear or wind, there is a different risk profile.

The geographic distribution of assets relative to specific regulatory and tax-related considerations also affects the Carbon Beta. For example, it is different to produce CO<sub>2</sub> emissions in Germany than it is in Ecuador because of the different regulatory frameworks the companies will be facing. The ability of a company to recoup higher carbon-driven compliance and operating costs from customers also drives the Carbon Beta – that is, whether a company has the ability to transmit the regulatory cost of carbon of its products without losing too much of its international competitiveness.

The technology trajectory – the level of progress achieved towards adopting and replacing production technologies – influences the Carbon Beta. It is cheaper and easier for some companies to abate emissions than it is for other companies because of marginal costs and, in general, their ability to identify and monetize revenue opportunities either by increasing their cost efficiency in manufacturing or by creating new opportunities for products and services.

The takeaway point from this whole presentation is that climate change is not only a risk that companies should address, but it also represents a huge level of opportunity for which companies can also take advantage.

### **Analytics platform**

The Carbon Beta analytics platform is a unique carbon profiling database of over 2,300 diverse companies around the world, with in-depth analyses on carbon profiling for about 850 companies. We have fewer companies with in-depth analyses because for some companies, software companies and the advertising industry, for example, climate change may not be a very big issue. For electric utilities or the mining industry, however, climate change *is* a very big issue. For the intense carbon sectors, some 40 to 45 sectors that we cover around the world, it’s important to go into an in-depth analysis using Carbon Beta.

The Carbon Beta analytics platform identifies and quantifies carbon risk exposures on both a company-specific and a portfolio-wide basis. The Carbon Beta analytics platform includes carbon emissions, estimated compliance costs based on where the companies operate and what the relevant regulatory regimes are, and an analysis and subsequent rating of company risks, management, performance trends, and opportunity in terms of carbon.

The ultimate goal of the platform is to have a signal, a ranking – what we call a Carbon Beta ranking – that identifies companies that are better positioned to benefit from carbon regulation and that have the potential to generate additional returns from the sale of their products and services.

I will explain this platform using three primary analytic elements. We’ll consider exposure at the industry level, and then carbon issues at the company-specific level. Lastly, we’ll look at turning that data into carbon financials for a company.

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### *Industry sector exposures*

The industry-level analysis identifies the exposures each sector has regarding climate change. We look at three different metrics for industry exposure – direct carbon intensity, indirect carbon intensity, and carbon market sensitivity – and then a combined carbon intensity rating. We use a scale from 0 to 5 that looks at each of the three metrics.

The *carbon direct intensity* is an indicator that captures the exposure to carbon regulations and constraints. This relates strictly to direct emissions – the emissions that are coming from manufacturing processes or from operations over which the company has financial or operational control. The *carbon indirect intensity* metric relates to electricity usage. It captures the sector sensitivity to upstream energy costs and potential impact as a result of a carbon-constrained economy. The indirect carbon intensity is proportional to energy consumption, but if you are a producer, it is also sensitive to your options for generating cleaner electricity.

The third metric is *carbon market sensitivity*, which is an indicator that captures the sector elasticity or sensitivity to climate change. Carbon market sensitivity looks at whether the products from a particular sector will experience a shift in consumer preference. Industries with high carbon market sensitivities include sectors that produce goods that have high greenhouse gas emissions during their useful life such as oil and gas products or cars and trucks, sectors that have invested assets that can contribute to carbon emissions such as finance and insurance companies, and sectors that emit significant carbon emissions like energy generation technology and manufacturing.

These three metrics together constitute what we call *carbon combined intensity*. These three different metrics and the compounded metric go into a scale from 0 to 5, with 5 being the maximum intensity and 0 the minimum intensity. In the example below, you can see that electric utilities are very carbon intensive. In terms of these three metrics, the metals and mining industry is also very intensive, but it does not have as much carbon market sensitivity as the electric utilities. With regard to insurance, banks, and diversified financials – bankers don't emit that much CO<sub>2</sub> (besides the flying they do everywhere!), but their clients do. They finance clients who are building coal power plants, for example. That is why we give them a high carbon market sensitivity.

We also weight these metrics according to each sector. In the auto industry, for example, the metric that will be most heavily weighted will be the carbon market sensitivity metric because cars are highly sensitive to consumer preferences regarding their fuel efficiency. The units in which we measure these intensities depend on the sector. There will be sectors in which products will be very homogenous – for example, a megawatt of power from electric utilities. Here there is a homogenous

sector product which can be measured in terms of a megawatt of power and the tons of CO<sub>2</sub> produced by that megawatt of power. On the other hand, in the chemical sector, there are diversified heterogeneous products, so sometimes the unit of measurement has to be CO<sub>2</sub> emissions per unit of revenue.

**Table 1** Example of industry sector exposure elements of Carbon Beta

Industry	Carbon Direct Intensity (in-house)	Carbon Indirect Intensity (upstream)	Carbon Market Sensitivity (downstream)	Carbon Combined Intensity
Electric Utilities	5.0	5.0	5.0	5.0
Metals & Mining	5.0	5.0	3.0	4.4
Insurance, Banks & Diversified Financials	0.0	2.0	5.0	1.7

Source: Innovest

### *Company-specific carbon analysis*

The second element of the research platform is the company-specific carbon analysis. I would like to say that it is sometimes erroneous to assume that a company's carbon footprint is paramount or the only factor to be assessed in determining the risk for investors. Climate risk has four dimensions, not one. We analyze the company's carbon management strategy, its carbon risk exposure, its strategic carbon profit opportunities, and its improvement trend regarding carbon issues. These four different pillars are what constitute a Carbon Beta rating.

When looking at carbon management strategy, we assess how each company develops its risk management capability regarding carbon. When we look at the carbon risk exposure, we look at the impact the corporate operations have on climate change regarding their own emissions as well as their exposure to the consequences of climate change – for example, pending regulatory schemes to reduce greenhouse gas emissions and extreme weather events. With regard to strategic carbon profit opportunities, we determine if a company has a well-developed business strategy and research and development investments that will result in the development of low carbon products and services. These may comprise anything from direct technical solutions to changes in services and operations that address climate change and lower emissions. The improvement trend is an overall trend or performance measurement for a company regarding how it is dealing with these carbon risks and opportunities.

Carbon analysis is not a one dimensional issue, but in fact is a complex problem that needs more sophisticated analysis across a number of pillars. The Carbon Beta analytics platform identifies the best positioned companies regarding carbon issues.

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### Carbon financials

The third part of the analysis platform is the carbon financials. The basis of this is to look at how the most important short and long-term consequences of climate change are being considered from a corporate standpoint. In this sense, there are carbon regulation realities that present risks to each of the companies. Many companies claim that the costs of carbon regulations will be relevant to their international competitiveness. Through carbon financials, we try to uncover what the impact may be that a company is going to experience. It has been done at the macro level with the Stern Report<sup>2</sup> and many other reports. We have tried to do this at the company level.

<sup>2</sup> Stern Review: Economics of Climate Change, available at [http://www.hm-treasury.gov.uk/independent\\_reviews/stern\\_review\\_economics\\_climate\\_change/stern\\_review\\_report.cfm](http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm)

The first of the elements of this model is the Weighted Average Country Carbon Reduction Target (WACCRT™). Depending upon where companies are operating across the world, there are different regulations. Ultimately, this metric sheds light on the fact that, given the government regulatory constraints by country, a company with high levels of greenhouse gas emissions that operates in non-regulated locations will experience a different competitive environment relative to peers that are largely based and operating in regulated areas.

A second element of the model is the carbon price. In general, we use carbon price variations from three different cases – minimum, maximum, and an expected case. With this data and the regulatory analysis, we calculate a compliance cost for a company – how much it is going to cost the company to comply for a period of a year with the regulatory regimes. Table 2 shows the different elements of the model and its output for a specific company.

Taking into account the compliance period for the legislation, we also calculate the net present value of the carbon abatement costs. We put these abatement costs in terms of the EBITDA and market cap of the company, just to provide a bit of context. We also use specific industry discount rates for the different companies we analyze.

**Table 2 Cost of compliance example for a company**

WACCRT -8.00%	Expected Case	Minimum Case	Maximum Case
Carbon Price (\$/TCO <sub>2</sub> e)	\$28	\$18	\$45
Annual Cost of Compliance (\$1,000)	\$394,192	\$240,298	\$632,622
Exposure (% of EBITDA)	4.43%	2.70%	7.12%
NPV of Carbon Abatement Costs to Meet Emissions Reduction Targets (\$1,000)	\$1,738,554	\$1,104,585	\$2,791,417
Exposure (% of Market Cap)	2.34%	1.49%	3.75%
Industry Discount Rate 7.70%			

Source: Innovest

### FINDINGS OF CARBON BETA

Part of the platform also looks at the carbon positioning of the company, and specifically, its carbon emissions. We are interested in direct emissions, the emissions

that are produced by the company, as the ones that are actually being regulated. We compare these emissions to the competitive set to establish a benchmark and determine the positioning of the company we are analyzing. In general, we use a carbon intensity metric that is in tons of CO<sub>2</sub> per million dollars because of the heterogeneity of different outcomes or different products the various sectors have. When we have more of a homogeneous product in a particular industry, we use tons of CO<sub>2</sub> per the specific output metric of that sector. We have found with our analysis that variability is wide between and within industry sectors, and yet these exposures are not fully priced into asset values.

From our analysis, we can see different industries with the cost of compliance as high as 50 percent of their EBITDA, and even within the same industry variations between companies of 3 to 13 percent (see Figure 2). So, there are different impacts in these analyses and which industry you are in matters.

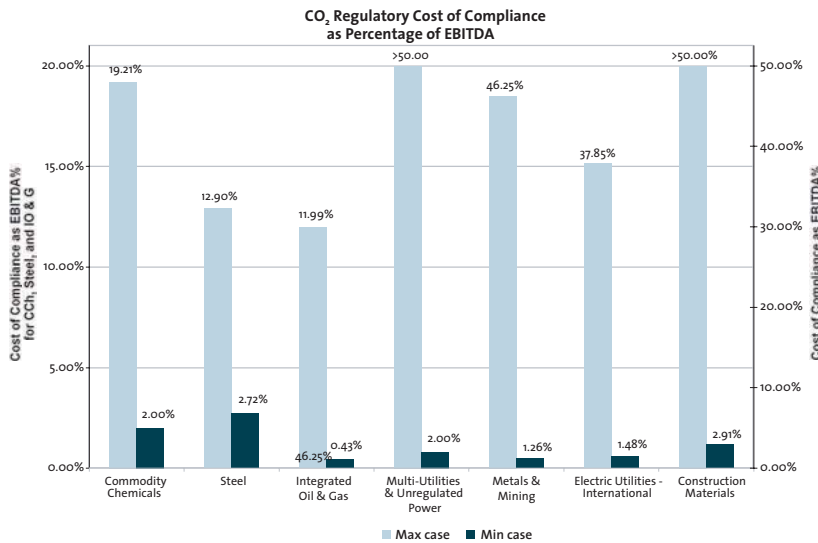
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We have also found that robust data is scarce and difficult to obtain. This creates a major information advantage, or disadvantage, for investors. It might sound unbelievable that even for projects in which companies commit themselves to disclose information, they in fact don't do it properly. This represents a critical part of this analysis.

**Figure 2 CO<sub>2</sub> regulatory cost of compliance as percentage of EBITDA**



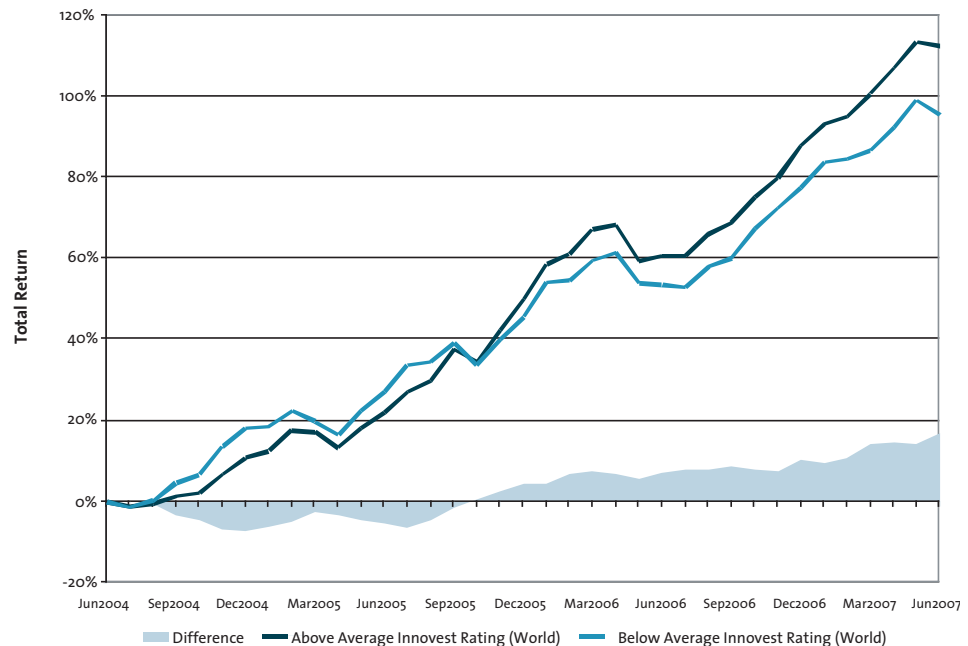
Source: Innovest

To help create an optimal portfolio performance, we combine quantitative analysis with institutional quality carbon risk research. We have found that if you look at just one aspect of the problem, such as emissions levels, it is likely that you will miss the peaks and will not generate any additional return. Figure 3 shows the results we have gotten from our research so far. It shows the performance of the companies that are deemed in a good position (i.e. above average rating) regarding climate change compared to those that are in a worse position.

The difference between these two portfolios is around 3 percent from June 2004 to June 2007. The two portfolios have been neutralized for each sector based on regional effects. As you can see, from January 2004 to September 2005 the above-average rated companies were underperforming in comparison to the below-average rated companies. However, after the third quarter of 2005 companies deemed carbon leaders started outperforming carbon laggards. As the first carbon market started in January 2005 (EU ETS), there was a lag for the effects of a carbon-constrained economy to be felt in the financial markets.

We also did this type of analysis for different regions. We did it for the U.S., and it is very interesting to see that in the U.S. these two lines are very close until March 2007. After March 2007, you can really start seeing how the leaders are behaving differently. The reason is similar to the above. At the beginning of 2007 there was a windfall of climate change related acts that were introduced to Congress, triggering awareness not only among the general public but specifically in businesses and in the financial markets.

**Figure 3 Performance of laggards and leaders**



Source: Innovest

Ultimately, through the carbon analytics platform we formulate a proxy signaling companies with good management. Companies with good management are likely to have a positive performance in the market. In Europe, for example, the difference is around 14 percent.

There are other approaches to analyzing carbon, of course. What we found is that, just like solutions to climate change, there is no silver bullet to analyzing climate change investments. No one can say that the solution for climate change is carbon capture and storage or nuclear energy. All of them need to be a part of the solution. Also regarding carbon analysis, there is no silver bullet in assessing the effects of climate change in corporate risk and performance.

### **LIMITATIONS OF ONE-DIMENSIONAL ANALYTICAL APPROACHES**

There are some other analytical approaches that are more one-dimensional such as emissions and disclosure-only analysis. I would like to go into the limitations of each of these approaches.

The first one is analysis based on the level of the company's emissions only. What we have found is that this one dimensional analysis doesn't really go far enough. It misses the company's carbon risk management, strategic opportunities, and improvement, which represent more than two thirds of the equation.

Further, we have found that big emitters could be a good bet in a carbon-constrained economy. For example, Statoil is a leader in carbon capture and storage and renewable energies. These two issues are strategic profit opportunities that will continue to give companies leadership in the integrated oil and gas sector in a low carbon economy. It would be inaccurate to assume that an oil and gas company or a company in another carbon intensive sector (such as electric utilities) is inherently a bad investment choice under this new carbon-constrained reality.

Regulatory constraints for carbon vary by country. Companies operating in regions with no carbon legislation do not face the same regulatory burden as companies operating in highly regulated locations. Focusing only on emissions levels disregards this global regulatory reality.

Still another limitation is that a big emitter could be improving over time. If emissions are grandfathered, then the company might already be under the abatement target and benefit from the allocation of allowances. That is, in order to reach an emissions reduction target, permits are allocated for free according to the company's historical levels. In this sense, a company could have a high level of emissions but it might have been improving over time. Therefore, if emissions are grandfathered, this company might be already under its mandatory emissions level and have a surplus of allowances. Good companies that have been improving in the way they manage their carbon risk may be punished just because of their size and sector classification.

In summary, the major shortcomings of models that focus exclusively on greenhouse gas emissions is the complete disregard for a company's strategic management of carbon risks, business opportunities related to low carbon products and services, and the actual history of carbon mitigation. In our view, this approach misses more than two-thirds of the climate change factors likely to impact

shareholder value. Therefore, an investment policy based purely on reducing the carbon footprint might harm financial performance.

Regarding disclosure-only analysis, it is a good first step, but it is not enough. Information that is disclosed is notoriously unreliable. It's inconsistent across companies and over time, and generally not validated by independent third parties. Therefore, disclosure is not a good proxy for performance.

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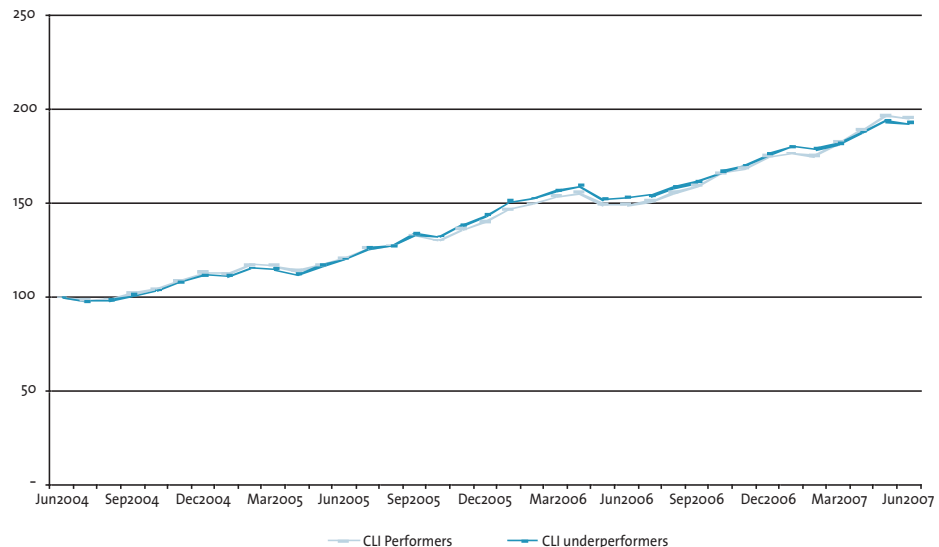
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Figure 4 investigates the relationship between disclosure and financial performance. We compared the share price performance of companies deemed under the Carbon Disclosure Project<sup>3</sup> as “disclosure leaders” to the share price performance of those deemed “disclosure laggards.” The results in the performance graph below should be somewhat unsettling for those placing undue reliance on purely disclosure-based analysis: there is no difference between the financial performance of disclosure leaders and disclosure laggards. Publicly disclosed information alone is an insufficient basis for achieving superior investment returns.

<sup>3</sup> CDP 5 Report, available at: [http://www.innovestgroup.com/images/pdf/cdp5\\_ft500\\_summary\\_report.pdf](http://www.innovestgroup.com/images/pdf/cdp5_ft500_summary_report.pdf)

**Figure 4** Limitations of disclosure-only based analysis



Source: Innovest

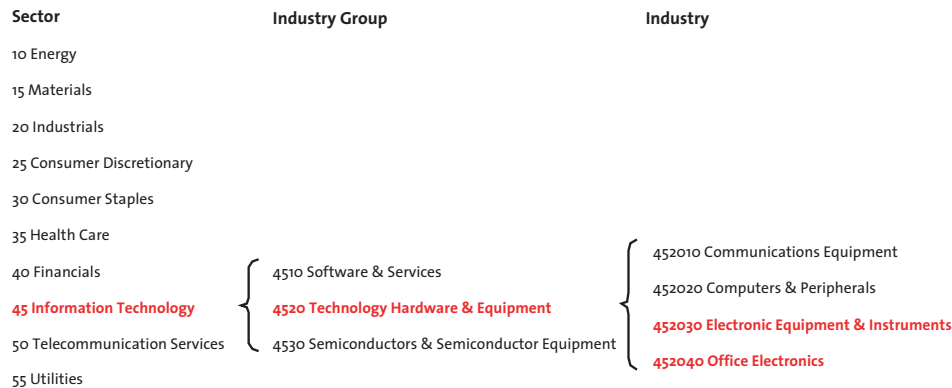
*Hiroshi Minami*

**CARBON BETA CASE STUDY**

By way of example, I’m going to show you one of the sectors I cover, the electronic equipment and instrument sector. According to our analysis, this sector has a carbon combined intensity of 2.1. This intensity was measured between 0 to 5, where 0 is low and 5 is high. 2.1 is relatively low, yet I chose this sector because there are some interesting practices done by companies in this sector.

First and foremost, it is important to understand where the electronic equipment and instrument sector falls in relation to the MSCI GICS (Morgan Stanley Capital International, Global Industry Classification Standard), which has four levels, in a tree structure. The highest level is the sector. The second is the industry group. The third is the industry, and the fourth is the sub-industry. This sector (see Figure 5 below) falls into the information technology sector, and then under the technology hardware and equipment industry group. Under this classification there are two industries – electronic equipment and instruments and office electronics. Under these two industries, there are actually four sub-industries, but technology distributors are not evaluated in this sector. All others are manufacturers, so we wanted to exclude distributors who have a different business model.

**Figure 5 Carbon Combined Intensity (2.1) for the electronic equipment and instruments sector**



Source: Innovest

In 2007 we evaluated 34 companies in this sector. There were lots of Japanese companies, 19 out of the 34, along with 9 U.S. companies and 6 companies from other geographical areas. In our Carbon Beta research framework, we have carbon management strategy, carbon risk exposure, carbon strategic opportunity, and carbon performance improvement vectors, as presented by Mario. In this sector, I put the most weight on the carbon management strategy vector.

For carbon management strategy, I mainly focus on two factors – emission reduction strategies and goals, and measurement and disclosure. When companies measure their greenhouse gas emissions, they usually have management structures.

For carbon risk exposure, I investigate product risks and regulatory risks, with more of a focus on regulatory risks. For regulatory risks, I basically check where assets are located. For example, if Company A is operating in Japan and there is a similar company, company B, operating in the U.S., Company A probably has higher mid-term regulatory risks because Japan has already ratified the Kyoto Protocol and thereby must reduce greenhouse gas emissions.

For the third part of the analysis, strategic carbon opportunity, I focus on two factors: products and services related to carbon issues and carbon credits generated from CDM or any kind of carbon reduction measures. And, for the carbon improvement vector, we focus on the carbon emission trend and all of the other factors we analyze. Ultimately, we rate the performance of companies within a given industrial sector on a scale from AAA (best in class) to CCC (worst in class), which is broadly similar to bond ratings.

I don't think you are interested in companies that aren't doing anything, so I'll focus on leading practices within this sector. In this sector, I appreciate companies that have lifecycle ideas in their strategy. For example, in the case of Canon, they have a goal to double net sales through reduced emissions from their product's lifecycle by 2010 relative to 2000 levels. Other companies like KonicaMinolta, Hitachi, and Ricoh have similar ideas, and they have tangible data to back up those kinds of goals.

In terms of actual carbon reduction targets, Konica Minolta, Ricoh and Xerox have targets focused on absolute amounts of greenhouse gas emissions, as opposed to normalized greenhouse gas emissions such as greenhouse gas emissions per sale. These three companies are the only companies out of 34 that have greenhouse gas reduction goals that cover their worldwide operations. Other companies have similar goals, but state only, for example, that they're going to reduce greenhouse gas emissions from Japanese operations by 6 percent, and do not cover their worldwide operations.

In the category of measurement and disclosure, I have a list of 11 companies. These 11 companies measure and disclose their CO<sub>2</sub> emissions, so one third of the 34 actually have a system to measure their greenhouse gas emissions. The amount of greenhouse gas emissions is usually six digits, from 100,000 tons to 900,000 tons. But there is an exception – Hitachi, which is a huge Japanese company, has seven digits, at more than 4 million tons of CO<sub>2</sub>.

Another interesting initiative is being undertaken by Ricoh. This company has a goal to reduce its own CO<sub>2</sub> emissions, and in addition, it's also going to require its suppliers to establish greenhouse gas reduction goals. Usually Japanese companies do not require suppliers to reduce their greenhouse gas emissions, and that's something exceptional.

Canon has a CO<sub>2</sub> emissions goal to reduce their emissions from logistics and their transportation operations, which is also a leading practice in the sector.

I'd like to talk about some interesting business opportunities pursued by these companies in the carbon area. Kyocera is a company that makes photovoltaic modules used in solar power generation. They also engage in fuel cell power generation research. Hitachi is a nuclear power plant manufacturer, which is gaining

momentum these days because of climate change issues. Hitachi also makes lithium ion batteries for hybrid vehicles, solar modules, materials for fuel cell power generation, and equipment to decompose PFC, which is a greenhouse gas. Ibiden is also an interesting company. They have an electronics division, but they also have a ceramics division that makes diesel particulate filters. This filter is used to remove particulate matter from diesel exhaust. Right now diesel passenger vehicles are gaining momentum, especially in Europe, partly due to climate change issues. This product is making a profit for this company. Lastly, Ricoh is a company involved in a Clean Development Mechanism project, and they say they're going to generate more than 200,000 tons of CO<sub>2</sub> emission credit per year. Ricoh's greenhouse gas emissions were approximately 300,000. If they use this emission credit to offset their own emissions, their carbon footprint will be very low. Ricoh is the only company in this sector that is engaging in a CDM project.

After I go through all of the publicly available corporate documents and third party documents, we score these companies to give a final rating. I consider Ricoh, Kyocera, and Xerox the leading AAA companies in this sector. Xerox is actually the only U.S. company in this sector that has a midterm carbon reduction goal, which is to reduce CO<sub>2</sub> emissions by 10 percent by 2012 from the 2002 base year.

This is how we analyze companies under the Carbon Beta framework. Now we are happy to answer your questions.

# Question and Answer Session

## QUESTION 1: Investor usage of framework

*I was wondering if you could talk a little bit about the investor response to this product. I know you mentioned a few institutional investors up front that are using the platform, but how are they using it? How are they weighting this relative to other fundamental factors?*

**Mario López-Alcalá**

There are several ways that investors use our data. One is for re-weighting their indices. Most of the time, investors combine our ratings and information with mainstream financial assessments for building and developing their investment strategies.

As Hiroshi's case study points out, we can see the risks and opportunities for the company from a nice perspective – the traditional accounting perspective and also the intangible value perspective that is not being currently valued in mainstream analyst research. In general, investors like J.P. Morgan combine our signal with their research in order to get their products. Some other investors give us their portfolios to analyze and audit to see what their specific weaknesses and strengths are.

In the case of re-weighting portfolios or indexes, the main interest is to keep the sectoral representation of the picks that the client did for purely mainstream reasons. Within each sector, however, through our research, the rebalanced index overweights securities of issuers judged to have relatively low climate-change risk, and underweights securities of issuers with relatively high risks from climate change. The result is that the new index replicates the return characteristics of the original index, while reducing investor exposure to the risks arising from climate change.

As I said previously, some other clients use our information by itself for integrating ESG issues in their mainstream analysis.

## QUESTION 2: Biggest industry surprise

*At the industry level, what industry gave you the biggest surprise up or down?*

**Hiroshi Minami**

I guess an industry that surprised me was the chemical industry because chemical companies emit many substances, among them CO<sub>2</sub>, and it is well recognized that energy utilization in this sector is very big in relation to their operational costs. The impact of climate change in this industry is thus significant, but lower than I would have expected for some of the companies.

I was also surprised that for construction industries there is potentially a huge impact, and in electrical utilities, emissions levels vary across the sector according to the different fuel mix of each company and the regulatory frame under which they operate.

## QUESTION 3: Data sets that are important but difficult to collect

*You obviously collected lots of data and did several different steps of classification, categorization, ratings and so on. What set of data would you say relative to its*

*importance was probably the one you had the most difficulty collecting? For example, there may have been something where it was really hard to get data for a particular area or category, but it wasn't that relevant. And it may have been a situation where it was easy to get data that was very relevant. Where can you think of where it was really hard to get data and it really mattered and left you with some uncertainty?*

**Hiroshi Minami**

If possible, I wanted to do more research on products – greenhouse gas emissions from products – but as that kind of data set is unfortunately nonexistent, I put a higher weight on carbon management in my sector. However, I wanted to put a higher weight on the products part or the strategic opportunity part. Given the unavailability of data, that was not possible. I needed to focus on carbon management strategy.

Even for the carbon management part, it is not easy to collect greenhouse gas emission data. For example, last week the Japanese government released carbon emission data from approximately 14,000 facilities in Japan, which I think is the largest dataset available right now. These data, however, are not easy to process. Even after we process it, we don't know if it's going to be a very good source for this type of research. So data shortage is always a problem, but we try to focus on whatever we can see or we can get and then make good assumptions about what we cannot see.

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**QUESTION 4: Factoring in management responses**

*Have you ever used a company's past management of similar problems – maybe in the energy markets or software permits in the U.S. – to sort of proxy what their management might be of carbon in the future as opposed to the kind of outputs and other things that you can put down on paper?*

**Mario López-Alcalá**

Within the U.S., we looked at the potential regulations and how they were going to affect specific sectors. For example, in the summer of 2007 we looked specifically at the Feinstein-Carper bill for electric utilities. It was not an economy-wide piece of legislation. Talking about management, we do look at the involvement of companies

regarding different regulations and whether those companies were actively addressing such regulations. Generally, what we can assume is that the companies that go beyond their regulatory compliance on one issue are going to keep doing it in different settings, whether it is with SO<sub>x</sub> or other substances.

**QUESTION 5: Embedded energy of products and accounting for indirect emissions**

*You don't include the embedded energy of materials and products into your calculation, right? You just mentioned that it's hard for you to include your energy footprint of products into your calculation. That means your indirect energy consumption or emission part didn't include the embedded energy of material use and the product use into your calculation. Is that correct?*

**Hiroshi Minami**

It's more no than yes.

*My second question is, how do you divide the parameters of energy and emissions between different sectors? For example, the electricity generators and the utilities – how do you divide their emissions?*

I'm not sure if I understood your question. How do you divide emissions, for example, that utilities are buying from other generators for resale?

*Utilities – apparently they didn't consume primary energy themselves. They're just like traders. How do you solve this problem?*

**Mario López-Alcalá**

The classification that we follow for emissions is the World Resources Institute industry classification. I believe that the emissions you were talking about go into Scope 3 emissions in order to avoid double counting. We only actually do an analysis on the Scope 1 emissions, which are the ones that are most readily available. In that sense, the Scope 1 emissions are the emissions that are generated through facilities owned by the company or where the company has the financial control.

Some companies are buying electricity from other companies and then reselling it, so those emissions are not being counted as direct Scope 1 emissions for the resellers, but are counted for the ones that are generated. For the company that is reselling them, they are counted as Scope 3 emissions. That is the way we account for these emissions in order to not double count.

**QUESTION 6: Double-counting and greenwashing**

*I have two questions for you. First, when you take the aggregate Carbon Combined Intensity (CCI) rating based on the three categories, use the 0 to 5 scale on each of them, and then look at the upstream and the downstream effects, how exactly do you de-couple the model? If you're looking at the utilities industry, for example, downstream energy use in the electronics industry is going to give them a higher risk rating, or so I would assume. And when you look at the electronics industry, you have to look upstream. It seems like you might be double counting if you don't de-couple them. I'm wondering how you deal with that.*

*And, secondly, Hiroshi, when you showed some of your research, you talked about how some specific companies were responding and you gave some quantitative examples of some camera companies. When you're looking at these companies, how do you decide? You started to touch a little bit on one of your answers previously about how you would like to look at the embedded energy in the products and things like that. But, off the top of my head, I would imagine that a company that produces film, which is rather an energy intensive process, would naturally be able to easily publish and achieve targets in a technology that's rapidly declining. How do you deal with technological transitions that are integrated into your model that will allow these companies to publish emissions reductions that they don't have to try very hard to achieve?*

**Mario López-Alcalá**

Regarding carbon intensities, one thing that we are always dealing with in this analysis is two sets of analytical results. One set is quantitative and the other one is qualitative. For example, when I was talking about the carbon market sensitivity of the different sectors, this was equivalent to talking about the carbon elasticity for demand for the specific sector. If I tell you that we could calculate the carbon elasticity for a whole industrial sector, I don't think anybody would believe me. It is a given that most sectors don't have perfect homogenous products and data for calculating it, and of course, companies are operating in different countries and in different regions. Those different regions also have different regulations and are subject to different preferences and market structures.

The question keeps getting more complicated as some quantitative data is non-existent. Therefore, we merge these two sets of analysis: qualitative and quantitative. When we have hard data, we use it. When we do not have it, but we have a good assumption of what could happen based on our expertise, we go for that. That is the way we try not to double count. Firstly, some cases we cannot analyze in a quantitative way because there is no data. And for some other analyses, what we are trying to do is to separate the effects of these indirect, direct or carbon sensitivity parameters in a qualitative way.

**Hiroshi Minami**

I interpreted your question as how do we evaluate companies who are having easier targets and accomplishing them versus companies who are having really difficult targets and not accomplishing them. Is that the right interpretation? That's a question that we always face when we analyze companies. One way to tackle that kind of cheating is to go back to their historical records. In my case, when I checked these companies' documents, I went back to data from 1990, the year the Kyoto Protocol says is the base year. By doing so, we can focus on long-term trend and avoid being cheated by companies' claims.

Thank you all for providing us with an opportunity to talk with you today.