

Sustainable & Responsible Investment

Conference report

November 09

For professional investors

The implications of climate change on your investments

Thursday, November 12 2009 at Axelborg, Copenhagen

Contents

- **A call to action** 2
Connie Hedegaard, Danish Minister for Climate and Energy
- **Winds of change** 6
A visit to Middelgrunden offshore wind farm
- **Principles for a better future** 8
Donald MacDonald, Trustee of the BT Pension Scheme and Chair of the UNPRI
- **PRI: a view from the United Kingdom** 10
Donald MacDonald
- **What to expect from the climate change lottery** 11
Eric Borremans, Head of SRI Research & Development BNPP IP
- **Creating energy from waste** 14
A visit to Amagerforbrænding
- **Local power wherever it is needed** 15

Tackling climate change by investing

The 20-day Yom Kippur War between Israel and Syria and Egypt in 1973 might seem an unlikely trigger for a small northern European nation to completely change its approach to energy consumption. However, the oil shortages that the conflict led to prompted Denmark to become one of the greenest countries on the planet over the next 30 years as it embraced new clean energy technologies to reduce its dependency on fossil fuels and minimise its citizens' impact on the environment.

It is therefore no surprise that Copenhagen has been chosen to host December's United Nations Climate Change Conference, which aims to determine a successor agreement to the Kyoto Protocol. But the city was also the venue for an event on **the implications of climate change for investors** hosted by Alfred Berg, BNP Paribas Investment Partners and Fortis Investments on 12 November. The day's discussions form the subject of this special edition of the BNP Paribas Investment Partners SRI newsletter.

Our event tackled a number of thought-provoking issues:

- ▶ The political implications of climate change
- ▶ Which asset classes will be the winners and losers?
- ▶ How should investors approach the matter?

The day before the conference, several delegates also attended a tour showcasing three clean energy technologies – wind power, waste-to-energy and biomass – in which Denmark is leading the way. We discuss these technologies, which clearly represent interesting current or future investment possibilities, later in the newsletter.

The financial community has an important role in tackling climate change, as we can be an important catalyst of progress by allocating money to the best ideas. Denmark has shown the world how it is possible to reduce its dependency on fossil fuels – can we as investors help lead the world towards a greener future? We hope that this newsletter provides you with some important insights into the investment implications of climate change.

Patrick Van de Steen,
CEO of Alfred Berg

A call to action

Connie Hedegaard will chair December's UN Climate Change Conference in Copenhagen. Since her appointment as Minister for Climate and Energy in 2007 she has been a driving force behind Denmark's clean energy successes and she has recently been appointed European Union Commissioner for Climate. A passionate advocate of the need to deal with climate change, she gave a rousing speech to open our recent conference on the implications of climate change for investors. We publish a slightly abridged transcript below.



As you know, we have a small event coming up next month in Copenhagen, and many people are asking me: am I optimistic or pessimistic about getting the ambitious outcome that we all wish to see? But in one sense you could argue that the conference has already been a success – despite the economic crisis, climate change is still one of the top issues on the political agenda, on the business agenda and on the agenda worldwide. Would that have happened three years ago if we'd had a similar economic crisis then? I'm sure the answer would have been no. We set this deadline two years ago and in one sense we have already produced a result – everyone is trying to address this issue now.

Now then, it's up to us to deliver. Of course the politicians have a very special responsibility, and I believe that investors like yourselves should cross your fingers even more than the rest of us to succeed because green industries will be a key area for investors in the coming decades. If we fail in Copenhagen, business, I would argue, will be the biggest loser, especially American business. Why is that? My reading is that whether we get an international deal or not, China, for example, will be going green no matter what. In its own interest – for pollution reasons, economic reasons, energy-saving reasons. Europe has set its own targets – we're going to reduce emissions by 20% by 2020 even if there isn't a global agreement. Japan has its own plan. So the US would suffer should there be no agreement.

I believe we can strike an ambitious climate deal in Copenhagen. But we need each other to do so. We also need to spread the message that Copenhagen isn't just about climate change. It is also about energy supply, energy security, migration and national security.

I would say that the longer we wait to set out the political framework, the greater the consequences and the costs. This has been well known since the famous Stern Report was published three years ago, and it was also stressed in this year's World Energy Outlook by the International Energy Agency, not normally seen as one of the front-runners of the revolution. It stated very clearly that from an economic point of view, it's imperative that we act now, as each year of waiting will cost us an additional USD 500 billion to solve the problems. It also says that this is the perfect time for action as the global recession has created a slump in investments, which means that right now we have an unparalleled opportunity to avoid a high-carbon lock-in and initiate the clean energy transition we need. We can do it, and at the same time create new jobs and generate profits for private investors, as well as paving the way out of the economic crisis. One could very much say that this is a win-win situation and that this is a unique opportunity we cannot afford to waste.

But there is a huge need for capital to launch this transformation. For instance, in the energy sector, can we imagine the shift from fossil-fuel-based energy production to one based on renewables without huge sums of money? Definitely not. That is why green industries will be a key area for investors for decades to come while carbon assets will increasingly become a liability. Earlier this year, President Obama's climate envoy, Todd Stern, commented to the Financial Times: "How good will the business judgement of companies that make high-carbon choices now look in five, ten, or twenty years when it becomes clear that heavily-polluting infrastructure has become deadly and must be phased out before the end of its useful life?". In other words, carbon assets may very well become the toxic assets of tomorrow.

I believe that investors have already realised this. Last year, global investment in renewable energy and energy efficiency amounted to USD 155 billion – for the first time ever, higher than investment in the fossil fuel industry. As you, investors, know better than anyone, certainty and predictability are crucial when making long-term investments. That's why it is also in your interests to get this binding political deal done in Copenhagen. We must have a strong



agreement with clear long-term signals to provide the certainty that investors need. And of course we also need global emissions reductions. I believe that is why we are starting to see big American companies leaving the American Chamber of Commerce. They know that it is in their interests to get this deal done. Huge companies like Nike, Apple and Johnson & Johnson have either already left or are speaking against the Chamber of Commerce because it is taking such a reactionary stance against climate change.

What about the political negotiations? Are we getting anywhere? I would say yes, things are progressing, but formal negotiations are progressing too slowly, and we still have crucial obstacles for Copenhagen. For instance, reduction targets and finance. This isn't just about numbers and amounts, it is also about issues such as ensuring transparency and making sure efforts and actions are measurable, reportable and verifiable – in short, ensuring that what was agreed on paper is practical and carried out. But numbers of course do matter. As I said, the fact that we set a deadline in Bali back in 2007 has already produced results and we see this momentum building up: the Chinese president, Hu Jintao, said very clearly that they are going to set a target of how they can reduce CO₂ intensity per unit produced. This is another way of saying that China will deviate from business as usual and I anticipate a specific Chinese commitment before Copenhagen. Mexico has announced substantial cuts in emissions; so have Indonesia, Brazil, Norway and Japan. The deadline is starting to work: governments know that four weeks from now they will be here and there will be a very high price for them if they come here empty-handed.

I didn't mention the United States, but it is crucial for Copenhagen's success that the US deliver emission reduction targets. As I see it, those who want to be the economic and political strategic leaders of the 21st Century will have to address this issue. Not just domestically, but also internationally. I believe that the political price of not delivering next month is extremely high, and I hope that no government thinks they can afford to pay that price.

But again, will there be a deal? What the incoming Danish presidency has realised is that reaching a legally-binding treaty may not be possible, but we can pave the way for one in the near future by making an ambitious, politically-binding agreement that catches the political momentum and the pledges that many nations have already given in the run-up to Copenhagen. I believe that this could be the year when the world changes track with climate change: instead of waiting for the last legal paragraph to be dealt with, we will cash in the political will to commit and deal with detailed legal issues afterwards, albeit within a clear deadline as to when this must be finalised.

A call to action

What we have to deliver in December is an agreement that records in black and white what governments can be held accountable for. I already mentioned emissions reductions, where developed countries have to do the most and show the way, whereas emerging economies must commit to actions and deviate from business as usual. And finally, the least developed countries must agree to following a sustainable, low-carbon growth path.

But I believe it's crucial to get all elements agreed on: mitigation, adaptation, technology and finance. Why? because they're interlinked: how would you speed up technology innovation if you didn't have binding commitments as to when to reduce? We must also address adaptation – how can we help the poorest and most vulnerable countries with the effects of climate change they are already experiencing? We must agree how to speed up the dissemination of technology. That is crucial – not least to the countries with the fastest growth, and it is interlinked with the financial issues. A worldwide carbon-trading system will help address technology dissemination and innovation incentives. In other words: reductions, adaptation, technology and finance.

Finally, the timing. Could any of us really argue that if we postpone for six months, twelve months, two years that anything will get any easier? I would say no. The pressure has been building up, politicians and governments know the time is now. And should we postpone until next spring? What will be easier next spring? Would the Americans come out with higher reductions? Can we be sure that there will not be a new economic downturn? You are more specialised in this field than I am, but according to some economists this is a possible scenario. Also, how will the situation in Afghanistan develop? In other words, when you have this window of opportunity, you should use it. It has not been easy to build up expectations, so we should use the momentum to conclude the political deal now. That's where we need you investors too: to show that it is doable and to help us educate the public, thereby increasing the pressure on governments to deliver.

Maybe some of you will be wondering, is this just a trend? Two years from now will we be discussing something else? This is crucial for the way that you make your investments. I strongly believe that this is not just a trend. There are going to be 9 billion people on Earth by 2050, so whatever we do there will be a huge demand for growth over the years to come. Huge growth in energy demand, huge growth in pollution unless we find smarter, cleaner, more energy-efficient ways of creating this growth. I believe it is crucial that we address this issue, even if there were no climate challenge. Clean, energy-efficient technologies will be necessary and in high demand. Just to make it clear, this is definitely not an anti-growth agenda, it is all about creating opportunities. I'm absolutely confident this is not going away.

I believe that the only kind of growth we can afford in the 21st Century is sustainable, green growth. I'm sure that everyone will want increased energy security and less-polluting energy sources. Declining stocks of fossil fuels urge us to think green and act fast. And it's certain that energy prices will go up. Let me mention again the International Energy Agency and its recent report. It has a scenario that it calls 450-147. What does that mean? The 450 refers to the parts per million of CO₂ in the atmosphere – the level that scientists say we should try to stay below. The 147 refers to the highest oil price we saw last year – USD 147 per barrel of oil. They argue that although this was not the only reason for the economic downturn, it played a part and we saw how vulnerable our economies were to high oil prices. So again, it's all interlinked. Climate, economy, energy security – they can all be addressed at the same time by making this climate deal. This is a very good reason for not postponing action.

So what you can do is help us build up the pressure. I think the best thing that business can do in the next few weeks is to emphasise the good business case that it pays off to address this agenda. And just to close I would say that Denmark is one of these good cases. Having addressed this issue for around 30 years, so that today we are one of the most energy-efficient countries in the world relative to the size of our economy, we have also created a very strong export area. So strong that last year our exports in energy efficiency and renewable energy increased by 19%. So this is also a job-creating agenda, it's definitely a growth agenda.

I believe it's extremely important that politicians see investors engage actively with the climate change challenge in ways that reflect that the combating of climate change is not only a burden, it's not just a cost, it's also an opportunity. And you, the large institutional investors, possess tremendous power to make businesses change their priorities. I believe that the countries and companies that hesitate will be the losers. The winners will be the first movers. We have a unique chance one month from now. We must seize that moment, but if not? Well then we risk seeing a so-called bottom-up approach, where different governments and regions invent their own systems. That would be a much more extreme situation for investors - much more difficult to handle and predict compared to a global arrangement.

Let's make the price for governments who don't want to deliver so high, that they cannot afford not to deliver. Let's change track. It's not easy, but it's necessary, and if the political will is there, I am still convinced that we can do it. Thank you.



Winds of change

Probably the first signal of Denmark's eco-friendly credentials that the delegates flying in to the upcoming UN Climate Change Conference will notice as they make their descent towards Copenhagen airport will be the impressive arc of wind turbines emerging from the sea.



The Middelgrunden wind farm, as it is known, became the largest offshore wind farm in the world when it was completed in late 2000. Consisting of a 3.4km-long curve of 20 wind turbines, its estimated annual electricity production of 89,000 MWh is equivalent to around 3% of Copenhagen's energy requirements. It is 50% owned by the Copenhagen municipal energy company and 50% by 10,000 investors in the Middelgrunden Wind Turbine Cooperative.

However, Middelgrunden's reign as the biggest of its type was short-lived, as it has since been dwarfed in size by Horns Rev 2, which was officially opened on 17 September this year. This giant wind farm is located in the North Sea, 30km off the coast of western Jutland. Its 91 turbines, which have a total production capacity of 209 MW, should be able to supply power equivalent to the annual electricity consumption of 200,000 households.

Wind power is the world's quickest-growing source of energy. In 2008, the global wind power market grew by 27 GW, which represented impressive growth of 29% on the 2007 level, and over 100 GW of offshore wind projects are being planned in the EU alone.

Wind power is big business in Denmark. Not only do Danish manufacturers represent 30% of the global market – a remarkable achievement for a nation with just 5.5 million inhabitants – it is so far the only country in which wind power provides over 20% of total electricity supply. This figure is set to rise to 30% by 2012, and experts predict that it could hit 50% by 2020.

Over the past ten years, exports of Danish wind power technology have increased by over 20% per year, to the point that they now account for 7.2% of the country's total exports, while the number of people employed in the field has risen by over 8% per year over the period. These trends are expected to continue.

The Danish Wind Industry Association represents over 230 companies, many of which are at the forefront of their field, so there is a large number of interesting investment opportunities to choose from. Vestas, the most famous, is the biggest wind turbine manufacturer in the world. It has installed over 39,000 wind turbines in 63 countries, employs more than 20,000 people globally and has a market capitalisation of over €10 billion.

However, with countries across the world set to develop their wind power capacity over the coming years and decades, many of the smaller, niche players that are developing cutting-edge technology could also grow very rapidly. It is an exciting time to be considering an investment in wind power.



Principles for a better future

Donald MacDonald is the Chairman of the Board of the United Nations-backed Principles for Responsible Investment (PRI), a set of guidelines that can be adopted by institutions that wish to address environmental, social and governance (ESG) issues in their investment decision-making. After his presentation in Copenhagen we spoke to him to find out about the progress of the Principles, where they go from here, and how he believes investors should approach climate change.



What do you think are the biggest successes of the PRI to date?

I think we've had a number of considerable achievements so far. For example, we have had over 630 signatories in just over three years. That's about twice as many as we expected over five years, which is really remarkable.

Another has been setting up the Clearinghouse, which provides signatories with a forum to share information about engagement activities they are conducting or would like to conduct.

Others include the assessment process, which is now giving the opportunity, particularly for small funds, to take a step back and examine their whole approach to investment, which they hadn't been doing before. I think this has been very important in raising standards. Then there's the academic network, which is just getting off the ground, but in the long term should have a tremendous impact.

The other area where we've been particularly successful is trying to raise the concept of responsible investment within the emerging markets context – both by OECD investors within emerging markets, and within emerging markets themselves. In fact, as we speak our executive director is in Beijing, talking to some Chinese financial institutions who are potential signatories.

So it's a really exciting time – everything is coming together, even though we've just experienced the worst financial crisis for 70 years. We thought we'd have a lower take-up in terms of new signatories due to the crisis, but in fact it seems to be increasing, and we're also getting donations from new signatories, so we now have a strong financial base for the future. We're very pleased with how things are going.

Are there any particular regions or groups that have been more receptive to the PRI than others?

As you might expect, the original core areas were Europe, North America and Australia, and we also have Board members from Brazil, South Africa and Thailand. But there have been some really big developments – for example, we've got a whole country network in Brazil, and there's a huge amount of interest in other developing markets. We believe that in Africa we will expand beyond South Africa, and we're looking at how we grow in the Middle East. So our signatories are widely distributed, and it's becoming genuinely global.

In terms of the different groups, for the first two years probably 40% of signatories were investment managers, 40% were asset owners and 20% were service providers. In the past year, though, there's been a huge take-up by investment managers – partly because there's a commercial motive, obviously, but I think it's also true to say that many investment managers are ahead of the game with respect to responsible investment. Sometimes it takes a while for these things to percolate through to pension funds, which traditionally haven't been terribly well resourced, which is why it's really important that investment managers and consultants understand sustainability issues.

How has the recent financial crisis affected investors' approach to responsible investment?

If anything, it's actually increased awareness of the need for responsible investment, and the falling markets of last year also demonstrated the need for a long-term investment horizon. I think the other issue is there's real anger among pension funds in particular at the huge sums of money being hoovered up by the investment banks – the amounts they are rewarding themselves for taking huge amounts of risk with other people's money and not making it transparent. I don't think pension funds did enough due diligence on the whole financial chain – we did on what we were investing in, but perhaps not sufficiently on counterparty risk.

Will climate change put pressure on companies and lead to more responsible investment?

I think investors and fund managers have collaborated well on issues like trying to get improved carbon disclosure from major companies. It's that kind of thing that we need to get much better at though. It's going to be a long road, but it's all part of the learning curve. I think dialogue with companies on how they deal with environmental costs – for example whether they're externalising their costs – is critically important. Huge issues will soon be facing us – drought, floods, storms, mass migration – and we need to focus on them much more. There is evidence that institutional investors are starting to, but it's still early days.

Climate change provokes other social issues. The Darfur conflict was in part caused by drought, as populations had to move to other areas to look for water, creating tensions. Elsewhere there's conflict between countries over water flow – people are damming rivers, for example – so there's a huge downside to all of this, but investors also need to get a grip on where the upsides are too, and again the investment managers and consultants have an important role to play.

Is there a danger that institutions signing up to the PRI don't fulfil their promises?

I would say so! What PRI did from day one, though, was say that once a group had been a signatory for over a year, it would be expected to go through an assessment process and report on its progress in implementing the Initiative's six principles. At the moment, that's the only obligation on signatories. If they don't, they can be delisted, and that's actually happened.

We also have to be aware that there is a danger that PRI could become a brand name, where companies in the commercial space sign up because they want to be associated with the brand without really doing much. But that should become obvious through the assessment process, and we need to take companies like that with us on this journey too. If there's not much improvement over a period then there would be pressure on them.

The PRI are currently voluntary; is there any prospect of them becoming compulsory?

The principles are aspirational; if it was a case of governments forcing companies to sign up to them my personal view is that that would devalue the concept as it would become a box-ticking exercise. On a voluntary basis, however, organisations have to make a conscious choice to become signatories. That means they're choosing to impose obligations on themselves – on their behaviours, how they operate as investors – and I think that's a much better concept.

What are the biggest challenges facing the PRI?

I think we need to become much better at everything we do. We've grown so quickly in such a short period of time we need to look at our organisational structure, which we're working hard on at the moment. We're working on how we can give more support to the investment community through our Clearinghouse and the academic network, and we also need to develop stronger organic links with the leaders of the investment managers. In particular, responsible investment should not just be seen as the responsibility of the responsible investment officer – it has to go to the board, the CEO, the CIO, the chairman – everyone has to be involved. That's the big task – trying to mainstream responsible investment within the investment community.

Is there any empirical evidence that investing responsibly increases returns?

There's an investment belief that better long-term results can be gained by incorporating ESG issues into the investment process. I'm not sure we can demonstrate that empirically yet, although that's one of the aims of the academic network. There's plenty of evidence that there's a correlation between companies that produce good investment returns and have high standards in terms of corporate responsibility and how they approach ESG issues. Which way the causality flows is open to question – I'm not sure you can disentangle that. It's something that needs further work.



Principles of Responsible Investments (PRI): a view from the United Kingdom

Donald is also the Director of the Trustee Board of the BT (British Telecommunications plc) Pension Scheme, the largest occupational pension scheme in the UK and a founder signatory of the PRI. We went on to talk about how his experience and responsibilities as an asset holder affect his view of responsible investment, and about developments in the UK market.

As a trustee, do you see any conflict between fiduciary duty and responsible investment? Which should be more important in situations where they do conflict?

We view one as being a continuation of the other. We don't believe we can carry out our fiduciary duty without being a responsible investor. Equally, you can't be a responsible investor without carrying out your fiduciary duty.

Is it easier for larger institutions to invest responsibly than smaller ones?

There's no question about it, there's an issue of capacity. I think that in order to integrate ESG and issues like climate change into your asset allocation, even for big funds, there's a lot of analysis and work to do. I think funds are quite heavily reliant on their investment managers and consultants for those things, and there's a price to be paid for that. Scale does impose practical limitations, but the PRI and collaborative engagement do make it possible for smaller funds to become more active in this area. I think the other point of the networking approach is that it gives the opportunity for information exchange and mentoring, something that smaller schemes really benefit from.

How are the PRI viewed in the UK?

We're doing well in the UK. Obviously there are lots of fund managers in the UK, and my guess is that the balance in the UK is fairly heavily tipped to the investment management side in terms of number of signatories. Pension funds are becoming increasingly exposed to the issues, though, and there's a steady sign-up. I think that lots of the big changes will come from the consultants and the managers. Interestingly, one view is that the consultants and managers in the UK themselves have a fiduciary duty to raise ESG issues with pension funds, even if the funds themselves have not discussed them. If that is the case there could be future legal issues for managers and consultants if something goes wrong and they haven't warned the funds about material risk from ESG factors.

Do you think the consultants have a good grasp of responsible investment?

I think there's a great deal of variation. Some of the niche consultants are really on the ball and factor ESG issues into all of their consulting work. Elsewhere, there are consultants that have their own responsible investment people but in some cases I get the impression that they're seen by others in their firms as just being in a compartment, and that their work isn't being integrated into the rest of the company's output. I was speaking to someone from a major international consultant a while back, and they're considering signing up for the PRI, but only after they've got it integrated into the whole of their organisation. That means that their investment consultants must be involved and up to speed with the issues, and also that their actuaries find a way of incorporating ESG factors into their asset-liability modelling. It's a big commitment, and the company realises that if it signs up it has to do so in a holistic way, which I think is very positive.



What to expect from the climate change lottery

Eric Borremans is Head of SRI Research & Development at BNP Paribas Investment Partners. At our recent conference he spoke about how climate change is likely to affect returns within the mainstream asset classes – large-cap equities and government bonds. As he pointed out, investors should already be considering which companies and countries are likely to profit or suffer from climate change.



I deliberately chose a provocative title for this presentation – what to expect from the climate change ‘lottery’. Lotteries usually have a few winners and several losers – let’s see what this one looks like.

Leaving aside moral considerations, investors have a lot to gain or lose from climate change. The impact of climate change on some asset classes is becoming clearer. CO₂ has become a tradable commodity – it has a price, and although the markets are still fragmented, they are set to grow dramatically. Companies involved in clean technology, renewables and energy efficiency all offer superior growth prospects.

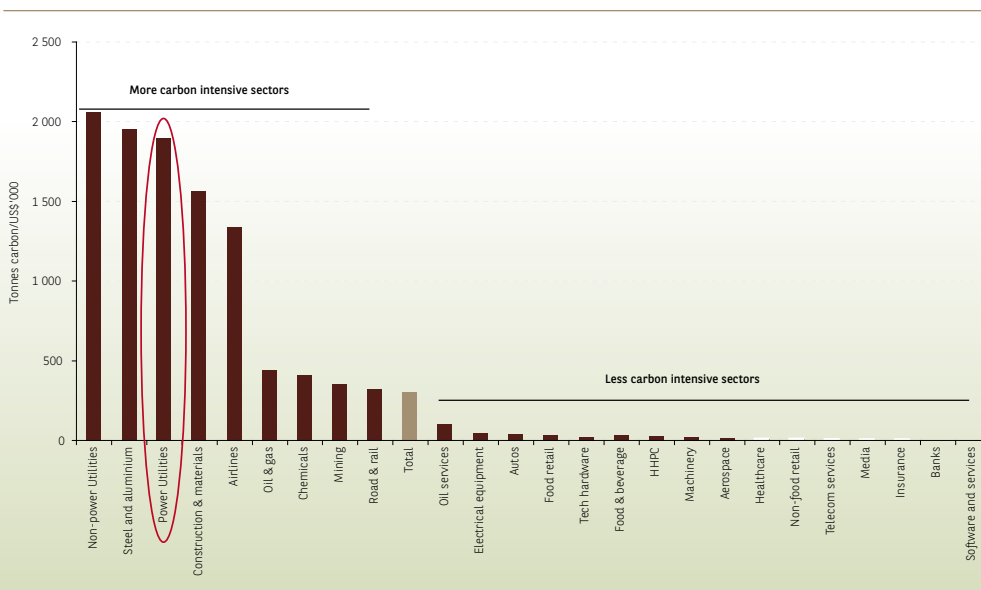
Elsewhere, the increased size of the universe is making it possible to build environmental indices, ETFs and structured products. Commodity prices look set to rise over the long term, and climate change is likely to have a real impact on property investment.

Some of these asset classes offer good opportunities today, but many remain niche areas – they may represent 10-20% of an investor’s asset allocation. What about the remaining 80-90%?

Equities

We need to ask ourselves three basic questions in order to better anticipate how climate change will affect large-cap equities. Which sectors and companies are likely to be most affected by the rising costs of greenhouse gas emissions? Which companies are likely to take advantage of the fast growth of niche areas such as clean technologies? What is the likely impact of extreme weather events on firms’ productive assets?

Answering these questions is critical in order to properly understand all of the financial implications. Paying for CO₂ emissions, for example, affects operating costs; building new plants has a direct impact on capital expenditure; meeting consumer demand for cleaner products impacts turnover; and developing new products affects R&D expenditure. More radically, is



climate change affecting the very viability of some business models? Or does it favour the emergence of new ones?

Let’s consider some different sectors. If we plot the CO₂ emissions of a sector as a whole against its market capitalisation, we can easily rank sectors by their relative carbon intensity. Utilities, Steel & Aluminium and Construction are some of the most carbon-intensive areas. These are then followed by a long tail of sectors with very low direct carbon emissions (see chart).

Power & Utilities

Electric Utilities are currently responsible for about 25% of greenhouse gas emissions. This is the single most important sector covered by the EU emissions trading scheme, which allocates allowances to emit a certain amount of CO₂. This cap-and-trade system was launched in 2005 and was initially very generous. However, since 2008 it's been more stringent, and from 2013 levels will be tightened again.

It's relatively easy to assess CO₂ emission liabilities as a percentage of earnings. The differences are quite drastic within the European Utilities sector, with at the low end around 10% of earnings at risk and at the high end up to 100% for the companies that are most reliant on coal or lignite to generate electricity. We can see that there will be winners and losers here.

Autos

According to the chart the Automobile sector has low carbon intensity, but this is misleading. Making a car emits one to two tonnes of CO₂. Over its lifetime, however, that car will emit 20-30 tonnes of CO₂. So the sector's indirect, product-related emissions are much higher.

Regulation of vehicle emissions is becoming more stringent, with Europe leading the way and China catching up quickly. Once again, there are clear quantifiable differences between European car manufacturers. An average Fiat car, for example, currently emits around 140g CO₂ / km, while a Porsche emits twice this level on average.

Financially, there are two ways to look at this. First, the European Commission has set up a system of penalties for companies that exceed their targets. These go up to €95 per gram of CO₂ per vehicle, meaning that if a manufacturer missed its target by 10 grams then it would pay a fine approaching €1000 per car sold. If a car maker sells 2 million cars per year, that's a potential fine of €2 billion.

The other financial aspect is that some manufacturers are more able than others to meet the increasing demand for cleaner vehicles. Two examples stand out. Toyota is well known, but more recently Renault has embarked on an ambitious programme to launch commercial, fully-electric vehicles by 2012, which it wants to represent 10% of its sales by 2020. So there could be big differences between car manufacturers over the years to come.

Oil & Gas

Again the previous chart only takes into account direct emissions – from refineries, exploration and production. Product-related emissions take this sector off the scale – it by far exceeds all the other sectors in terms of carbon intensity.

What drives company valuations in the Oil & Gas sector? According to figures from Goldman Sachs, around half of a company's valuation depends on its proven reserves. We must also bear in mind different fossil fuels contain varying levels of carbon – the carbon content of natural gas is around half that of coal and significantly lower than that of oil. If you calculate the proportion of a company's reserves that are natural gas rather than oil, we see very different results. Some companies' reserves are made up of around 75% natural gas, going down to 30-40% for others. So the carbon liabilities of reserves, which themselves make up the bulk of a company's valuation, differ vastly, and this is something markets will increasingly take into account.

Finally, extreme weather conditions could have a major impact on companies in the sector. For example, those with a high level of production in the Gulf of Mexico have already faced severe challenges from hurricanes, and this looks set to increase in the future. Companies with no presence in that region will be less exposed. There will be winners and losers here too.

Banks

Typically, banks emit around three to four tonnes of CO₂ per employee per year, and this doesn't vary much between institutions. But if a bank finances, say, coal-fired power stations, its "indirect" CO₂ emission is much higher. Can we work out banks' indirect carbon emission? We need to look at their exposure to carbon-intensive sectors on the one hand and renewables on the other. But also, most importantly, what are the assumptions the banks make in integrating carbon liabilities into their financial models? Data here are lacking, but there are already crude figures showing how much financing European banks provide to fossil fuel and renewable energy projects. Again, there are big differences between institutions.

Fixed income

Let's concentrate here on sovereign issuers. The Stern Review concluded that climate change, if left unchecked, will reduce welfare per capita by 5% to 20%. It also stated that if we act today to prevent climate change, the actual cost will be around 1% of GDP. So the global cost is between 1% and 20% of GDP, but that's an average. There will be winners and losers. For example, Canada could benefit from higher crop yields as it gets warmer, whereas countries closer to the equator are likely to suffer.

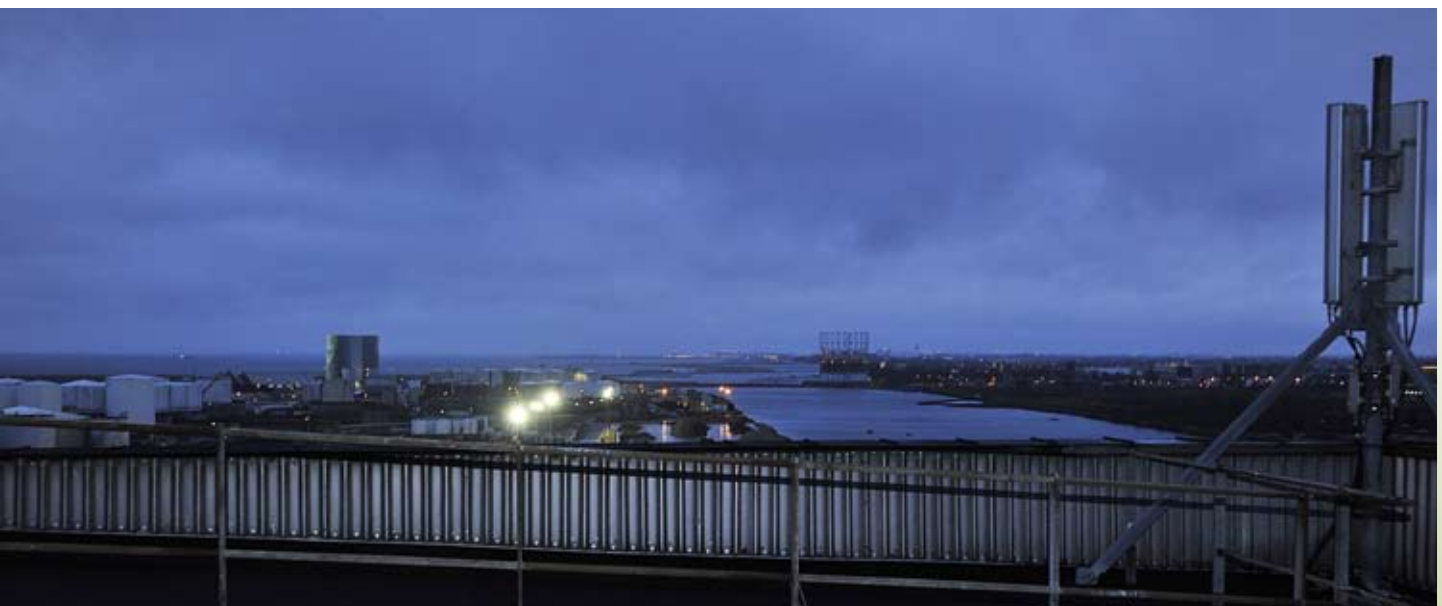
We saw before that climate change is a source of risks and opportunities for companies, and it is for countries too. Climate change is bound to have an impact on future economic growth and, therefore, states' creditworthiness. However, if you do a search for "climate change" on S&P's sovereign credit rating methodology you get no returns. So investors are faced with a fundamental problem when it comes to government debt: there simply hasn't been enough research carried out to enable investors to make an informed judgement about the impact climate change may have on individual countries and their future capacity to pay back their debt.

The way forward, in our view, is to develop a proper climate change assessment on a country-by-country basis that could be based on, for example, degree of dependence on hydrocarbons, share of renewable energy used, vulnerability of renewables to changing weather, and the socio-economic effects of climate change (e.g. changing crop yields, public health impacts and catastrophic losses from extreme weather events).

How will we use the research when it has been carried out? Consider two scenarios. One country has a strong credit rating but a very poor climate change assessment – is there room for a downgrade? Similarly, should a country with a poor credit rating but an extremely positive climate change assessment be upgraded? Again, further research is necessary.

Conclusion

As we search for winners and losers, I would like to highlight a quote from Alfred Rappaport in 2005. "Financial analysts fixate on quarterly earnings at the expense of fundamental research... they believe that estimating distant cash flows is too time-consuming, costly, and speculative to be useful." Our major challenge is to reconcile our propensity to focus on the short term with the urgent need to focus on the bigger picture – the longer term. As investors become more sophisticated we will be better equipped to ask the right questions. At the start of my presentation I talked about the climate change lottery. As it turns out, I believe that if you ask the right questions, the lottery could be quite predictable in some respects. There are reasons to be optimistic.



Creating energy from waste

Every day, household items get thrown away because they are deemed to be of no use – things such as packaging, leftovers from dinner, and broken electrical appliances. However, they all represent useful resources to companies such as Amagerforbrænding, which recycles and produces energy from household and company waste in Copenhagen.



Amagerforbrænding is active in all the stages involved in dealing with Copenhagen's waste. The company runs eight recycling stations in the capital area and a large waste-to-energy incineration plant, and it also deposits waste that cannot be reused in environmentally-safe landfill sites.

It is best to recycle where possible, as this helps save resources and minimise CO₂ emissions. Each year Amagerforbrænding receives more than 5,000 tonnes of waste metal – such as dented frying pans, old filing cabinets and dilapidated radiators – at its recycling stations. Making new items from recycled materials requires significantly less energy than making them from new materials, minimises the amount of ore that has to be mined, and reduces the amount of CO₂ that enters the environment – the company's metal recycling activities alone prevent 10,000 tonnes of CO₂ emissions each year.



Seventy-one percent of the waste handed in can be recycled. Most of the remainder – 26% of the total – is sent to the company's waste-to-energy incineration plant. Every day, around 1,400 tonnes of rubbish arrive at the plant, which transforms it into eco-friendly energy. Inside the plant, the waste is burned in four large furnaces at 950°C. The heat is used to turn water into steam, which is fed into two turbines that generate enough electricity to power around 70,000 homes.

But this isn't the end of the story. When the steam has passed through the turbines, the residual heat is used to heat water in the district heating network that runs in underground pipes beneath much of the Copenhagen area. It heats the homes of 140,000 families, equivalent to around 10% of the total district heating capacity in the area.

Even the residue from waste incineration can be used. The slag that is left is scraped from the bottom of the furnaces, and can be used in place of gravel in construction works, such as new roads.

Finally, the remaining 3% of the waste that cannot be recycled or burned is deposited or specially treated.



Of course, Amagerforbrænding doesn't carry out all these services for free. It receives money from the government for every tonne of waste it handles, and it is paid by companies that bring in their waste to be burned, for the electricity it produces, for its district heating services and for its slag.

Although enterprises such as Amagerforbrænding will only ever be able to provide a small proportion of any nation's energy requirements through waste incineration, they nevertheless play an important role in diversifying the energy supply and reducing CO₂ emissions through recycling. They are likely to grow in importance, size and number as the world seeks alternative sources of energy.

Local power wherever it is needed

Of all the forms of renewable energy, it is biomass that probably has the greatest potential to be a major source of electricity in the future. The EU plans that by 2020, 20% of energy production should be based on renewable energy sources, and around 60% of this is expected to come from biomass and biogas.

In contrast to the other main renewables, such as wind, hydroelectric and solar power, biomass energy plants can operate continuously around the clock. Biomass is therefore a useful base load technology whereas wind power, for example, can only act as a supplement to the energy system.

What exactly is biomass? It is material derived from living or recently-living organisms, such as wood chips, straw, food waste or agricultural residues. It is an attractive fuel as it is much cheaper than fossil fuels, it is thought to be CO₂-neutral, and it is generally widespread.

Typically, energy from biomass is produced in large power plants. For example, the New Hope Power Partnership, which is the largest biomass power plant in the US, is a 140 MW facility that uses sugar cane fibre and recycled urban wood to generate power for its large milling and refining operations. It also supplies renewable electricity to nearly 60,000 homes. However, in Europe, large-scale agricultural developments such as those in North America are rare, and so the cost of transporting biomass to a plant to be processed can outweigh the income generated by burning it.

Small-scale biomass plants are therefore of much more interest in Europe, and one company with the technology that could make such operations viable is Stirling DK in Denmark. This company makes small biomass power plants that use local fuel sources to produce power for large buildings, small companies, industrial facilities, schools and villages across the world, including in developing countries.

Based on the Stirling engine, which was invented back in 1816, the process involves combustion of biomass outside the engine. In contrast to the internal combustion engine, which has to use high-grade energy sources such as fossil fuels, external combustion means that much lower-grade fuel sources can be used. Just as importantly, no specialist knowledge is needed to operate the plants, allowing them to be used in remote areas by the local population.

As well as producing electricity, the company's plants can also be used to distribute the excess heat that the process generates – for example in the water-borne central heating system of a large building, or via a small, simple district heating system. It is much easier to distribute heat in this way from a number of small plants than from a centralised plant as the latter requires a much larger, more expensive distribution network.

In areas without the need for heating – some areas of the developing world, for example – the technology can also be used for desalination – generating fresh water from seawater.

Although the technology involved is still in its early days, and there are hurdles to overcome, Stirling DK has already installed ten plants across Europe. Once the process is refined, though, small-scale biomass plants such as these have huge potential to spread across the world and act as cheap, reliable sources of eco-friendly energy for everyone who needs it.



Engine small enough to fit in a container



A pared-down control panel

Alfred Berg

Alfred Berg is a Nordic asset management company with around 160 employees and EUR 16 billion in assets under management (as of October 30 2009) in quantitative, fundamental and fixed income investment strategies. Together with Fortis Investments we offer our clients a wide range of investment solutions, including top performers in many asset classes.

Alfred Berg is part of Fortis Investments. As part of the forthcoming integration of Fortis Investments with BNP Paribas Investment Partners, Alfred Berg will become one of the specialist investment partners within this group of asset management companies.

BNP Paribas Investment Partners

BNP Paribas Investment Partners is a global asset manager. Following the integration with Fortis Investments, it is set to become a top tier player in the global arena and the fifth-largest European asset manager with EUR 522 billion* in assets under management and advice. It will have a wide-reaching geographic presence, with some 5000** professionals in 45 countries throughout Europe, Asia and the Americas. It will be a client-focused organisation, with around 600 client-facing staff serving institutional and distribution clients in 70 countries, including its four core domestic markets (France, Italy, Belgium and Luxembourg).

*Figure as of 30 September 2009. BNPP IP: EUR 359 billion; FI: EUR 163 billion

** BNPP IP: 2600 employees in 34 countries; FI: 2300 employees in 35 countries

**For more information about
the company and our team of expert fund managers, visit**

www.bnpparibas-ip.com - www.fortisinvestments.com



**BNP PARIBAS
INVESTMENT PARTNERS**

Fortis Investments

Publisher: Philippe Marchessaux, **Editor in chief:** Anthony Finan, **Deputy Editor:** Maryelle Ouvrard,
Graphic Design: Studio Graphique BNPP IP, **Translations:** Tectrad, CPW Willemetz

Disclaimer

This document is issued by BNP Paribas Asset Management (BNPP AM)*, a member of BNP Paribas Investment Partners (BNPP IP)**, and is produced for information purposes only and does not constitute an offer to buy nor a solicitation to sell, nor shall it form the basis of or be relied upon in connection with any contract or commitment whatsoever or be taken as investment advice. This document makes reference to a fund or funds (a "Fund" or the "Fund(s)") authorised and regulated in its/their jurisdiction(s) of incorporation. No action has been taken which would permit the public offering of the shares in any other jurisdiction, except as indicated in the prospectus of the relevant Fund(s), where such action would be required, in particular, in the United States, to US persons (as such term is defined in Regulation S of the United States Securities Act of 1933). Prior to any subscription in a country in which a Fund is registered, investors should verify which compartments and which classes of shares are authorised for public sale there, as well as any legal constraints or restrictions there may be in connection with their subscription, purchase, possession or sale of the shares of the Fund(s). The information contained in this document is provided without prior knowledge of your circumstances, including your financial position, risk profile and investment objectives, and does not constitute a personal recommendation nor investment advice. Investors are recommended to seek the advice of their usual financial adviser in order to assess the suitability of the Fund(s) as an investment. Investors considering subscribing for shares should read carefully the most recent prospectus and consult the relevant Fund(s)' most recent financial reports. Applications may only be made on the terms and conditions contained in the prospectus. The prospectus and the latest semi-annual reports are available from BNPP AM, local correspondents, if any, or from the entities marketing the Fund(s). Investors should consult their own legal and tax advisors prior to investing in the Fund(s). Given the economic and market risks, there can be no assurance that the Fund(s) will achieve its/their investment objectives. Past performance is not a guide to future performance and the value of the investments in the Fund(s) may go down as well as up. Returns may be affected by, among other things, investment strategies or objectives of the Fund(s) and material market and economic conditions. Performance figures are shown net of management fees, but do not include subscription fees or taxes. Investors may not get back the amount they originally invested. Opinions included in this document constitute the judgement of BNPP AM at the time specified and may be subject to change without notice, they are not to be relied upon as authoritative or taken in substitution for the exercise of judgement by any recipient and are not intended to provide the sole basis of evaluation of any strategy or instrument discussed herein. For further information, please contact an authorised distributor of the Fund(s). The list of authorised distributors is available from the registered office of the Fund(s) as detailed in the relevant prospectus(es).

* BNPP AM is an investment manager registered with the "Autorité des marchés financiers" in France under number 96-02, a simplified joint stock company with a capital of 62,845,552 euros with its registered office at 1, boulevard Haussmann 75009 Paris, France, RCS Paris 319 378 832. www.bnpparibas-am.com.

** «BNP Paribas Investment Partners» is the global brand name of the BNP Paribas group's asset management services. The individual asset management entities within BNP Paribas Investment Partners if specified herein, are specified for information only and do not necessarily carry on business in your jurisdiction. For further information, please contact your locally licensed Investment Partner.

