

Climate change: what impacts on the financial sector?

Speakers



Corso Bavagnoli

Ministry of Economy and Finance, France , Directeur du Service du Financement de l'Economie



Paul Fisher

Bank of England , Deputy Head of the Prudential Regulatory Authority and Executive Director



Abyd Karmali

Bank of America Merrill Lynch , Managing Director, Climate Finance



Spencer Lake

HSBC , Group General Manager and Vice Chairman, Global Banking and Markets



Michel Madelain

Moody's Investors Service , President and Chief Operating Officer



Frederic Samama

Amundi , Deputy Global Head of Institutional & Sovereign Clients



Jonathan Taylor

European Investment Bank (EIB) , Vice President



Elizabeth Corley

Allianz Global Investors Europe , Vice Chair



Erik Van Houwelingen

ABP , Board Member

The Chair invited Panel members to summarise their messages briefly. An investor replied that there needed to be more visibility and predictability around public policies, and the efforts around better understanding of the risk and transparency exercise that the FSB had launched would need to be built on.

A bank representative stated that COP21 had been a significant step forward, but the INDCs (countries have agreed to publicly outline what post-2020 climate actions they intend to take under the new international agreement, known as their Intended Nationally Determined Contributions) were not yet investor ready, and needed to be transformed into action plans that could act as investor prospectuses. An insurance representative insisted that having investor ready projects was critical, as was producing updates on what was now ready for investment.

Sharing of best practices between policy-makers would need to be encouraged

A representative of a ratings agency stated that sharing of best practices between policy-makers would need to be encouraged, in order to accelerate asset mobilisation. A representative of another bank stated that he would want to take the principles based approach that had come out of Paris and make this more of a mandatory approach.

A representative of a regulator stated that focusing on delivery was most important: It was vital that, when the next COP occurred, some concrete success stories could be identified. A representative of a different regulator stated that a global carbon price framework would not be achieved in the foreseeable future. As such, disclosure and awareness raising activities would need to be about front loading price signals in the absence of a global framework. Secondly, COP22 should enable the development of a credible framework to enhance private flows of money to address climate risk, or climate change, in developing countries. Finally, another institutional investor stated that support needed to be offered to local governments to develop reliable, stable policies.

Objectives of the session

The panellists were asked to clarify the diverse types of challenges posed by climate change to the financial sphere and the subsequent roles for the public and private sectors to address them appropriately.

The session also tried to assess the sense of urgency that addressing the challenges related to the topic requires. The impact that the recent Treaty of Paris had on clarifying the issues, related stakes and the roles for public and private players was also commented.

Executive Summary

Issues Faced by Financial Institutions resulting from Climate Change

Categories of Risk

There were several aspects of risk: the direct physical impacts of climate change; the the economic, regulatory and policy initiatives that were happening in consequence; the legal risks arising for those who are seen to have caused it, not mitigated it or who have insured against liability risks... Rating Agencies focussed on the first two categories but to date, physical risks had only a limited impact on most asset risk ratings. More of an impact was resulting from regulatory and policy initiatives in the areas of coal, oil and gas. One rating agency notably had reviewed its portfolio to assess the relevance of these risks across the sectors they covered, and had found that in 11 sectors, there was immediate and elevated risk coming out of either policy or regulatory initiatives; medium to longer term risk in 18 sectors; and lower risk in 57 sectors.

Financial stability risks affected the insurance industry most directly, because these had very long term assets matching very long term liabilities and others underwrite climate risk directly or indirectly. Prudential rules could not be easily adapted in order to mitigate climate change. The Bank of England was about to publish a staff working paper on how all of these issues affected central bank responsibilities notably via potential volatility in asset prices affecting financial stability. But also, volatility in energy and food prices would affect monetary stability.

Possible added value of financial institutions related to climate change

China alone required hundreds of billions of investment each year to support its transition to a greener economy. Beyond the discussion about changing from fossil fuels to renewable and cleaner energy, more attention needed to be paid to how vulnerable economies would be helped to deal with the consequences of climate change. The 'V20' nations, consisting of 43 countries and around 1.6 billion people, were particularly vulnerable to catastrophic climate related risk. To address these kinds of risk, the reinsurance community, NDB community, private sector, the Green Climate Fund, and others would all need to work together. These countries were predominantly agrarian, and the risks posed by climate change in the agrarian community - including water supply and pollution control - needed to be borne in mind, with significant investment in mitigating them.

Actions Taken

The evidence for climate change was now incontrovertible and generally accepted, and appropriate policy actions needed to take place accordingly. The sooner the world took action to address climate change, the less extreme these measures would need to be.

The Financial Stability Board had set up a Task Force on Climate Related Financial Disclosures, which was due to report its final conclusions on how the landscape of existing measures could be simplified by the end of 2016. A G20 study group on Green Finance had also been set up, co-chaired by the People's Bank of China and the Bank of England, and would deliver a draft first report to ministers in July 2016

Climate risk was now being factored into investment decisions globally. To make further progress, it would first be vital to improve information frameworks. Some progress had taken place in relation to this, but the standards were still too fragmented, and needed to be streamlined. The FSB task force would be examining the issue of disclosure frameworks, and financial benchmarks linked to climate change needed to be developed. The rating agency sector was becoming increasingly focused on green finance, both in their day to day activities and in relation to investment processes and the availability of funding for green finance.

Policy-makers were trying to accelerate the transition towards green finance in other ways: for instance, France had passed a law that made the carbon footprint almost mandatory for asset owners.

Asset managers were also becoming increasingly active in the fight against climate change. They had invested in indexes such as MSCI, FTSE and S&P; new innovations had been developed that allowed polluting companies, or those with stranded assets, to reduce their climate change related risks without changing their market exposure in the short run. A platform was being developed under the rubric of the United Nations, which would allow investors to share knowledge in relation to climate change; 25 asset owners were now involved, who around COP 21 committed to the gradual decarbonisation of a total of USD 600 billion in Assets under Management. That was a sharp increase from USD 100 billion in just one year and showed that investors were moving into the right direction. Insurers aimed to both mobilise the supply of investable assets at the right price while avoiding price discontinuities, and determine what could be done in relation to risk mitigation: whatever happened some adaption risks would still need to be managed. One of the big challenges faced by the insurance sector was how to help identify long tail, unquantifiable risks through policy measures, consistent disclosures and consistent transparency, so that these could be priced into asset values. Pension providers were also adapting to the need for green finance, with one organisation having committed to a 25% reduction in the carbon footprint of its portfolio; earmarking €5 billion to invest in renewable energy; and doubling its commitment to highly sustainable investments from €29 billion to €58 billion. A number of banks had created partnerships with each other, with asset managers and super sovereigns to engage in creative financing to devise innovative new solutions, as had been seen with the financing of Meerwind.

Contributions of the Financial Sector and appropriate Policies

Roles of Public and Private Entities to mobilise private financing and inflect high Vs. low-carbon financing ratio

There were a number of estimates regarding how much money would be required to meet global green finance goals, from \$38 trillion between 2015 and 2030 to \$114 trillion between 2010 and 2030. The public sector alone would not be able to provide this much money. However, roughly \$95 trillion of assets under management was held by asset owners; as such, convincing even small number of investors to take action meant a significant reallocation of capital or debt, which gave policy-makers options.

The proliferation of ESG ratings around assets under management was significant. Around 30% of global assets under management have a ESG rating, which represents a steep increase from around close to zero a decade ago. Banks needed investors to help them de risk their portfolios, to enable them to re lend into the green economy.

The issue of infrastructure financing represented a key problem that needed to be solved. There was not yet an industrialised, homogenised asset class, and governments would need to be involved in helping to create this; France and China, among others, were leading in this space. The role of multilaterals needed to be increased, with major NPBs encouraged to create a homogenised product that global investors could dip into, pricing for sovereign and credit risk.

Market Failures require long-term policies to avoid late pro-cyclical reactions

Both climate change and the policy measures designed to address it would have unpredictable consequences. Financial markets were forward looking, and asset prices would change suddenly in response to breaking news; this was likely to give rise to financial stability risks, which had already been seen in relation to the global oil price. Entities were also leaving themselves open to mispriced risks by failing to price for the likelihood of companies being fined for pollution or other climate changing activities; even when entities were aware that they had risks, they did not necessarily know when they would crystallise or how large they could be.

The world was only now admitting that climate change was a problem, and was struggling to adjust. Investors would need to determine both how they could invest proactively in mitigation activities, and how they could avoid the risks created by the lack of mitigation over the last 25 years. Individually, all of the initiatives that had been outlined would be insufficient to meet global warming targets; all of the players in this space would need to consider how they could work together more effectively, while avoiding 'knee jerk' policy reactions to sudden crises that would add to instability.

The Treaty of Paris had been a change of tack

The Paris agreement had demonstrated that public authorities around the world were firmly committed to limiting global warming to well below 2°. Since this agreement had been signed, there had been a number of developments: climate risk was increasingly being seen as a challenging part of the investor portfolio, only hedgeable to a certain degree. Around 1,800 gigawatts of renewable energy had been committed to by countries by 2030; the Paris plans represented an overall acceleration of decarbonisation from about 1.3% per year to 3% per year,

which did not get the planet to its 2° target, but still represented a significant opportunity that would need to be taken advantage of. However, investors would not be attracted to this opportunity unless liquidity, risk sharing, and scale were addressed. Reporting was also becoming a more standardised area of activity.

Pursuing New Initiatives

Mitigating risks could be best done via greater disclosure, to encourage smaller market fluctuations when these risks materialised, and more accurate pricing. Operating via large risk pool mechanisms was also a promising approach, and micro insurance would be heavily in demand in agricultural communities in V20 type countries, such as municipal bond issuance.

Supply side factors would also need to be considered: the projects had to firstly be available to be invested in. Project management capacity in the public sector would need to be rebuilt, and there would need to be good sectoral and regulatory frameworks, conducive to sustainable investments. To make the transition, the EU would need to invest an additional €270 billion (or on average 1.5% of its GDP annually) over the next 4 decades¹. These investments consisted in large part of small projects, worth €10 million to €20 million; to mitigate the problems caused by the higher unit costs of these projects, and challenges in relation to finance, some bundling would need to take place. Private money was not yet being channelled effectively to deal with climate change in developing countries; these projects were notably difficult to structure.

In the current low return, low interest rate, low growth environment, there was enormous demand for yielding assets that could be appropriately priced. Investing in green had moved from being an exclusion strategy to an inclusion strategy; however, efforts would need to take place to ensure that price discontinuities did not arise because of abrupt policy changes, and that the pricing of these risks could be done with as much information and as much consistency of information as possible. Banks could help in a number of areas, including harmonisation of projects in relation to the non financing reporting directive, green securitisation, and credit enhancement; they would also need to give thought to the question of what would happen if a climate related catastrophe occurred. The FSB's guidelines for disclosure would allow the buy side to exercise more discerning judgment about what they invested in, and the infrastructure hub that had been established globally could not be allowed to fail.

1 - http://ec.europa.eu/clima/policies/strategies/2050/index_en.htm

Detailed Summary

Introduction

The high level signing ceremony of the Paris Agreement took place in New York on 22 April, and the agreement was now open for signature for roughly one year until 17 April 2017. Four months after the success of the agreement, it was now time to move on to implementation, ratification, and increased ambition. Implementation of the Paris Agreement requires a transition towards a low carbon economy, which means an incremental role for green finance. Trillions in long term investments were needed in green and climate resilient infrastructure, which include investments in renewable energy, transport and energy infrastructures, energy efficient buildings, and industrial processes. The Panel discussed how to move forward after COP21, and what challenges

and opportunities exist for the financial sector, both public and private, to scale up green finance.

Issues faced by Financial Institutions resulting from Climate Change

Categories of Risk

One panellist suggested to distinguish between two types of climate-change related risk, the first were the consequences of the regulatory and policy initiatives that were underway, and the second was the adverse impact related to the assets affecting the environment over time. These types of risk were very different. It was possible to measure and assess with a good degree of accuracy the consequences of regulation and policy initiatives, but it was much more difficult to predict the second type of risk.

There was a lot of uncertainty around how this risk would impact the investments that an organisation dealt with; how the organisations that carried these assets would react to this risk; and over what timeline this would take place. Today, these types of risks had a limited impact on credit risk, but in the areas of coal, oil and gas, there was a lot of regulation and a lot of policy initiatives that had a direct impact on cash flows and the value of assets. These were the assets that were more pregnant and more visible for credit assessments.

A rating agencies had gone through its entire portfolio and tried to assess the relevance of these environmental credit risks across the sectors covered. In 11 sectors, worth about \$2 trillion in debt, there was immediate and elevated risk coming out of either policy or regulatory initiatives. These sectors included unregulated utilities and coal and coal related activities. In a further 18 sectors, worth about \$7 trillion of debt, risk could be material, but over the medium to longer term. These sectors included mining, ex coal, oil and gas, automobile, building materials, and chemicals; in these areas, mitigations and adjustments existed that could reduce the risk. In roughly 57 sectors, worth about \$60 trillion, there was a lower risk, and environmental risk was not expected to have a material impact on credit quality across the time period considered.

Adapting prudential rules to deal with climate change raised concerns

A representative of a regulator stated that financial stability risks affected the insurance industry most directly, because some firms had very long term assets matching very long term liabilities and others underwrite climate risk directly or indirectly. A lot of the regulator's work had therefore been focused on the insurance sector for example, the Bank of England had published an influential report on this the previous year. At the moment, the regulator was mainly focused on supervisory follow up, rather than new regulatory requirements: i.e. talking to the industry, determining what their risk management processes were, and finding out what they were doing.

The representative added that he was 'concerned' by the thought of trying to adapt prudential rules to deal with climate change. Technically these rules could be adapted to deal with some of the risks of climate change or other ESG concerns, but this risked undermining their prudential objectives. A better approach to reduce climate change might be either to use fiscal policy to change incentives, or to go for straightforward legislative directions and restrictions.

The Bank of England was about to publish a further paper on how all of these issues affected central banks: it was mainly an issue of financial stability arising from volatile asset prices, but greater volatility in energy and food prices would also affect monetary stability.

Possible added value of financial institutions related to climate change

A representative of a regulator noted that China alone required hundreds of billions a year to 'clean up its own backyard'.

A representative of an insurer stated that there had been a lot of discussion about changing from fossil fuels to renewable and cleaner energy, but the risks related to climate change in the agrarian community - water, water supply and pollution control - needed significant investment, and there were good opportunities in this space. More attention needed to be paid to how these vulnerable economies, and also large economies with major populations and major demand, would be helped to deal with the consequences of the climate change that had already occurred and that which would take place over the next 25 years.

The 'vulnerable 20' were heavily impacted by catastrophic climate related risk

A representative of a bank exposed the issues stemming from the V20, the 'vulnerable 20', made up of 43 countries totalling a population of around 1.6 billion. The total GDP of these countries was significant; their economies were very agrarian focused, and were heavily impacted by catastrophic climate related risk and the amount of money that they needed to both mitigate and adapt their economies for the next generation.

For these efforts to work, the reinsurance community, National Development Banks community, private sector and the Green Climate Fund, along with others, would all need to work together. This work would need to be done very quickly. His bank had looked at five or so projects over the last four or five months, and were 'crowded out' whenever they tried to enter a project.

A participant in the panel stated that in addition there were good opportunities in the market, but better standardisation was required to make this a global, mainstream market.

Actions Taken

A representative of a regulator stated that climate change was one of the most political things he had been involved in during his long career in a central bank. The evidence supporting the fact that climate change existed was now incontrovertible and generally accepted, although there was not yet full agreement that it was man made. By the time the world had accumulated enough evidence to prove that climate change was anthropogenic, it could be too late to carry out appropriate policy actions. The sooner the world took action to address climate change, the less extreme these measures would need to be. Secondly, regardless of the causes, measures were already being taken to reduce man-made effects, and so, from a regulatory point of view, real risks arose from this combination of physical change and policy change on the other even if one didn't agree on the causes.

Over 400 different disclosure measures had been identified around the world

The FSB during the previous year, had set up a private sector Task Force on Climate Related Financial Disclosures, which had produced one initial, scoping report. Final conclusions were due to be produced by the end of 2016. The first report looked at the landscape of existing measures. Over 400 different disclosure measures had been identified around the world, and the challenge was now to make these more consistent. The representative noted that the Task Force was open to anyone who wished to get involved in this to do so.

A G20 study group on Green Finance had been set up that year, co chaired by the People's Bank of China and the Bank of England. This study group planned a first report to ministers in July 2016, covering options on how the banking sector could be made greener; developing the green bond markets; the role of investors; risk assessment, and how progress could be measured.

A panellist evoked an insurer that had a two tier policy. The first tier was to ask what could be done to supply investable assets at the right price while avoiding price discontinuities. The more that could be done to mobilise supply and make market forces work, the better. AFME, ICMA, and other associations working with policy makers was 'absolutely key', because by working together, success could be achieved more quickly than working separately. The second tier was to ask what could be done on risk mitigation, given that mitigation on its own would not be sufficient and some adaptation risks would still have to be managed. This gave rise to questions about prudential and supervisory responsibilities, and the more that ratings agencies could be enabled to price for some of these unknowns, the more the supply side would be encouraged. One of the big challenges was how to help identify long tail, unquantifiable risks through policy measures, consistent disclosures and consistent transparency, so that these began to be priced into asset values; the July report would hopefully address this.

Carbon pricing would be a good goal to aim for, but would be quite difficult to reach; parallel processes might be necessary.

To progress further, the first challenge would be improving the information frameworks

Another regulator stated that the transition to greener finance was a worldwide movement, which could be seen in the way that climate risk was now being factored into investment decisions; in the development of methodologies to evaluate climate risk; and the financial flows in green bonds, low carbon infrastructure, and the financing of transition. In Europe, this movement had been accompanied by two extra 'pushes'. First under Solvency II in relation to project finance - which has been an important incentive to move insurance companies and asset managers towards low carbon investments - and the Investment Plan for Europe. To progress further, the first challenge would be improving the information frameworks. Some progress had taken place in this space, such as the Green Bond principles - which were enhanced in 2015 - and a number of initiatives, but the standards were still too fragmented, and needed to be streamlined. At some point, this would need to be taken into account in the regulatory sphere, but for now, he believed that the private sector should be left to work on this.

A lot had been said at G20 level about disclosure frameworks; the FSB would be tasked with looking at this.

The Disclosure Task Force that had been launched was private sector led; it had been modelled on the Enhanced Disclosure Task Force, which had produced quite good results for the banking sector. The questions and answers had not been pre set; and as of today, the answers had not yet been developed. Some of the principles that the Task Force had developed so far had been quite good, but were 'pretty high level', and would need to be made more specific. The Task Force was looking at externalities in particular: not just carbon disclosure, or the risks of individual firms, but the downstream and upstream consequences as well. Financial firms probably had very small carbon footprints, but if they were lending to heavy polluting industries, this had to be taken into account in their disclosures. The task force was doing a very good job in this area, but the challenge would be making sure that the work had a sufficient scope. This was not just being done for listed equities, or for the industrialised world. Finally, developing financial benchmarks linked to climate change would be a key element regarding the fragmentation and the depth of the markets, and this also needed to be progressed. Further work was expected from the industry in relation to this topic.

A rating agency had also been increasingly focused on green finance for the last several years, in two ways. The first was how relevant this risk was to what ratings agencies did day to day - i.e. assessing credit risk - and the second was what type of contribution they could make to the investment process and the availability of funding for green finance. These agencies contributed to standards and provided transparency.

A 'fascinating shift' among asset owners now becoming involved in tackling climate change

A representative of an asset manager stated that over the past 18 months, his organisation had observed a 'fascinating shift' among asset owners: these were now becoming involved in tackling climate change, as opposed to the trend over the past 25 years, where only governments and NGOs had been trying to address this problem. Investors had invested in indexes like MSCI, FTSE, S&P, and there were now innovations that allowed polluting companies or those with stranded assets to reduce their climate change related risks without changing their market exposure in the short run. This was, in a way, a free option on climate change: if nothing happened, the company would get the same market returns. These products represented a 'straightforward first step' that investors were taking.

The representative's organisation, among others, had been appointed by the United Nations to create a platform for sharing knowledge in relation to climate change. Investors had been developing these platforms on their own, which had been a sub optimal approach.

At COP21, his organisation had been able to announce that 25 asset owners were involved in the platform, including ABP and Allianz, who represented collectively \$3.2 trillion of assets under management. The members of the platform committed to decarbonise their portfolios by \$600 billion, which meant aligning portfolios with the low carbon economy. Some of these were using green bonds; some of them were putting a swap top on their portfolios; and some were implementing low carbon indexes. This sent a message that green investing was feasible and scalable, rather than 'something you do to look good in your annual report'.

In London, in Singapore, and in France, policy-makers were trying to accelerate the transition towards green finance. Listed companies in the UK and Singapore had to disclose their carbon footprint; in Brazil, if you lend money to a corporate that corporate would have to explain what it was doing about climate change. France had passed a law a couple of months earlier that made the carbon footprint disclosure almost mandatory for asset owners.

Climate risk was pension fund participants' primary concern

A pension provider had rewritten in 2015 its policy on responsible investing; climate change and risk had been an integral part of that. As long term investors, this organisation needed to show that it cared about these developments that were changing the face of the Earth, although not every pension fund had been thinking this way in 2015. It had been necessary to create a very clear policy this had meant having a policy that embraced inclusion and engagement.

At the same time, however, 100,000 of this organisation's participants had been asking them to divest from fossil fuels. His organisation had engaged significantly with these participants, and it had emerged that climate risk was these participants' primary concern. As such, this organisation's definition of its fiduciary role had become not only generating return, but doing so in a responsible manner. This organisation aspired to play a leading role and to be an active promoter of some of the changes that were needed, but in order to do so, it needed the support of its participants. To fulfil the promises made in its policy, the organisation had committed to a 25% reduction in the carbon footprint of its portfolio. It had €5 billion available to invest in renewable energy, although the representative noted that it had been difficult to find projects. It would also double its investment in highly sustainable investments, from €29 billion to €58 billion.

The pension provider had also produced a policy paper, which it shared with its participants; this paper consisted of both 'popular' and 'technical' versions, and could be downloaded in English from his organisation's website. Finally, boards and representatives of participants and institutional investors would need to be clear on their policies and what they meant, and then act on them. Acting meant combining looking for sourcing for projects while at the same time engaging with policy-makers.

Achieving a nine to one ratio in lending exposure to renewables versus coal mining.

A representative of a bank stated that his organisation had put some effort towards accelerating the flow of capital from high carbon to low carbon; it had created the 'Catalytic Finance Initiative' in September 2014. This had been part of the Paris Action Day, along with the Portfolio Decarbonisation Initiative. This had identified that the 'tail winds' in the policy environment, the change in risk, and opportunities were quite strong, and there were a lot of opportunities in the clean energy space. The bank had achieved around a nine to one ratio in its lending exposure to renewables versus coal mining, which represented a 'massive turnaround' for it, but there was a lot more that could be done.

The bank now had a partnership with other banks, with asset managers, and with super sovereigns. Collectively, the representative was confident that players in this space could work together to engage in some creative financing, and come up with innovative new solutions that would bring these opportunities into the right return area. Some examples had already been seen, such as the Meerwind refinancing (Wind farm project located in North Sea 23 km north of the island of Helgoland). This had been Europe's largest ever renewable energy bond; it needed 42 different investors, with eight different tranches.

Green finance had already grown beyond a cottage industry: by some measures, there was \$21 trillion under management that was using ESG metrics. Green bond markets were still small in relation to asset issuance as a whole, but had grown exponentially, and were now spreading into

the private sector; big US corporates were now issuing green bonds. However, a lot more needed to be done.

Contribution of the Financial Sector and appropriate Policies

Roles of Public and Private Entities to mobilise private financing and investment and inflect the current high carbon versus low carbon financing ratio

A representative of a bank stated that there had been a lot of reports written about green finance. WEF (World Economic Forum) had estimated that \$114 trillion was needed between 2010 and 2030; New Climate Economy had predicted \$93 trillion in the same period, and the International Energy Agency had predicted \$38 trillion between 2015 and 2030. A lot of effort was going to be required; more than the public sector alone could provide.

\$95 trillion of assets were held by asset owners who were concerned in climate change

A speaker stated that the European Investment Bank was a particularly committed player in this space. It financed €20.7 billion of climate action projects last year, €2.2 billion of which were in developing countries. It expected to provide around €100 billion for climate related investment between 2015 and 2020, and had a Climate Action Strategy, agreed last year with its shareholders, that was focusing on reinforcing the impact of climate financing, building resilience to climate change, and further integrating climate change considerations across its processes.

A representative of an asset manager stated that he estimated that roughly \$95 trillion of assets under management were held by asset owners who were concerned in climate change issues. These were the asset owners who had been backing carbon neutral initiatives; 0.1% of this figure was \$100 billion, which meant that even convincing a small number of these investors to take action meant significant reallocation of capital or debt. This promising initiative allowed policy makers to start thinking about how they could leverage these developments.

The financing gap in green finance is so large that only 10% to 15% of the necessary investment could come from the public sector. The remaining investments needed to come to come from capital markets and the private sector.

China was pushing very hard in relation to everything that related to carbon pricing; it would launch a national initiative in 2017, was promoting green bonds, green indexes and green transparency, and was engaging in other activities as well. The representative believed that a great deal of people were underestimating how important China was in the climate finance space.

A bank representative noted that about \$90 trillion could be deployed towards the burgeoning asset class related to climate change. The proliferation of ESG ratings around assets under management was significant. \$59 trillion had been signed up to the UN Principles for Responsible Investment and around 30% of assets under management globally had an ESG rating, an increase from close to zero a decade ago. In Europe, around 60% of assets under management used an ESG rating as some kind of predictor. Moody's and Standard & Poor's had recently included ESG ratings in their credit analysis.

Bank's ratio of lending to high carbon versus low carbon economies was in the range of 10 to one to 15 to one

Participants would need to pay a lot of attention to 'what the money wants'. Norges had announced last week that they were going to divest themselves of 52 coal related companies, which was a significant announcement. Bank's ratio of lending to high carbon versus low carbon economies was in the range of 10 to one to 15 to one, but this ratio was changing. Banks needed investors to help them de risk their own portfolios, to enable it to re lend into the green economy.

This was an infrastructure problem, and a number of people had been talking for many years at Eurofi about what was needed from an infrastructure perspective. The counterparties that were involved in solving infrastructure issues had collectively failed so far to create an industrialised, homogenised asset class. To solve this problem, governments needed to be involved; there was a lot that they could do to homogenise across project identification and climate friendly policies. Some countries were doing better than others, such as France, and it was also important to pay attention to what China was doing. China made up 30% of the world's emissions; they were driving a top down agenda that crossed all asset classes and sectors, and had defined where they wanted to be.

In Washington the previous week, Jim Kim had talked about what multilaterals did in the infrastructure and green spaces. This was 'fantastic' work, but was regionally specific rather than globally homogenised. To reach an industrialised proposition, they needed the NPBs to identify what was important: this meant two areas, the first was credit enhancement and the second was risk mitigation.

Homogenised risk mitigation proposition around political and FX risk is needed

The representative of the bank stated that he would want the 10 biggest NPBs to look at their best credit enhancement products and have all of these adopted, to create a homogenised product that that investors around the world could dip into and price in sovereign and credit risk. For risk mitigation, he believed that they needed one homogenised risk mitigation proposition around political and FX risk. He noted that green finance was 'effectively a cottage industry'; to create a properly industrialised system and get money freely flowing into the green infrastructure asset class, industry bodies such as AFME and ICMA would need to cooperate with multilaterals and governments.

The representative of the asset manager commented that two other forces needed to be considered in this space: millennials and China. A survey conducted about 18 months ago at Davos had shown that men in their 50s or above were not interested in climate change; women of a similar age were more interested, and for millennials, this was their number one priority. As such, many providers or pension funds were now paying attention to these clients, and were trying to promote products that would attract investment from this generation.

Threatening Market Failures require early long term policies to avoid late and pro cyclical regulations and reactions

A representative of a regulator stated that climate change had long term effects; policy measures also took a long time to come in, and neither of these processes would be smooth. Policy changes

would come unexpectedly, not necessarily in a predictable way. Financial markets were known for 'bringing forward' the reactions to events; they were forward looking, and asset prices would jump in response to news as it occurred. This was where the major financial stability risks were likely to crystallise. The representative noted that he believed the fall of the oil price over the last couple of years probably reflected some already existing climate change risks, to some extent. The fact that long term demand was likely to be very substantially less could already have caused oil prices to fall, and perhaps more importantly, might put a lid on the upside to any recovery in the oil price.

The risk management issue had been explained in a very straightforward manner by Martin Wolf in the Financial Times on 17 June 2014. In his article, Martin Wolf had said that as markets were short term oriented, they priced the likelihood of polluting companies being penalised as zero, but over the long run could not guarantee that polluting companies would never be penalised. If an entity thought that this probability was 15%, 20%, or 50%, then it had mispriced risks in its portfolios, and it was their job to identify them and try to reduce their weights.

These risks were not simple to manage

Similarly, Mark Carney alluded to cases like Arch Coal and Peabody Energy - where it is alleged that the directors of corporate pension schemes failed in their fiduciary duties by not considering financial risks driven at least in part by climate change²¹ - illustrate the potential for long-tail risks to be significant, uncertain and non-linear.

The debate had shifted from 'saving the planet' to identifying how portfolios were exposed to very important risks. A representative of an asset manager commented that even when entities were aware that they had risks, these risks were not simple to manage, because they do not know when these risks would occur and they did not know how big they would be.

The planet was already warming; to entirely mitigate this risk over the course of 25 years, it would need to significantly decarbonise its activities. Mitigation had an enormous role to play in this respect; One did not know whether to be pleased or worried' about the fact that this process had only just started, because policy change was always accompanied by potential disruption.

Market forces alone would not create the speed to catch up

Having now admitted that there was a problem, the world was now struggling to get to the stage that it should have been at 25 years ago. Investors would need to determine both how they could invest proactively in mitigation, and how they can integrate climate resilience and adaptation concerns in their investment decisions and processes. Major NPBs and MDBs were key to this process; market forces alone would not create the speed or the impact to catch up quickly enough. All of the initiatives discussed would be insufficient to keep global warming at a 2% level, so those present would need to think about how all of these could be brought together, including policy, supranational work, risk mitigation and credit enhancement, and the huge and growing demand. Individual lines of development would not be able to reach a point where the risk could be fully mitigated.

A crisis was already taking place: some global warming had already occurred, and even with the extraordinary commitments made at COP21, the 25 year target was going to be a big challenge, and achieving the well below 2° goal would be very difficult. However, this was a 'slow burn' crisis,

rather than a cataclysmic event, which would come with its own consequences. A representative of the insurer warned that, if a particularly acute symptom suddenly manifested, players in this space should avoid 'knee jerk' policy reactions. The world needed long term policies that were delivered quickly, in a coordinated way. Crises tended to give rise to get pro cyclical regulations and reactions, and it was not clear that those that had been seen in response to the 2008 financial crisis had been positive or negative developments.

The Treaty of Paris had been a 'change of tack' which increased the awareness within the financial sector

A regulator stated that the Paris agreement had demonstrated that public authorities around the world were firmly committed to limiting global warming to well below 2°. Some people had argued that, because this conference had not achieved a universal carbon price mechanism, it had not created the right incentives for the private sector and, specifically, the financial sector to adapt to climate change. However, he did not share this view: through the Paris COP21 agreements, there had been a 'change of tack' and a growing awareness of issues within the financial sector.

A representative of a bank stated that, since Paris, three areas of evolution had become most prominent from his bank's perspective, both on the corporate side and the investor side: these were risk, returns, and reporting. Regarding risk, his bank had heard from the regulators and the ratings agencies, as well as the investors, that climate risk was increasingly seen as a challenging part of the investor portfolio that was only hedgeable to some degree.

On the returns side, an interesting set of insights had arisen from the strategies that countries had presented in Paris. Around 1,800 gigawatts of renewable energy had been committed by countries by 2030; the plans in Paris represented an overall acceleration of decarbonisation from about 1.3% per year to 3% per year, which did not get the planet to its well below 2° target, but still represented a significant opportunity that would need to be taken advantage of. However, investors would not be attracted to this opportunity unless the critical issues of liquidity, risk sharing, and scale were addressed.

Finally, in relation to reporting, this was becoming a more standardised area of activity. That was crucial for the investors to make informed decisions; it was promising to see that this was being taken forward at the G20 and FSB levels.

Pursuing New Initiatives

A regulator stated that his organisation was primarily focused on supervision, not regulation, but there were regulatory activities that could be useful; the Financial Stability Board was looking at this. One of the best ways of mitigating some of these risks was greater disclosure, so that people would take these risks into account in advance, and there would be less of a price fall when they did materialise.

This way, people would also have better information with which to assess the risk, so that the actual movement in the asset prices was the right movement, rather than over exaggerated.

The financial sector could be part of the problem, or it could be part of the solution. In the insurance industry, there was greater opportunity to underwrite new business, and there was also the opportunity to be part of financing the trillions of dollars of new investment that was going to

be needed to help the transition to a cleaner planet.

The projects needed to be available in the first place

One good example of what could be done was operating via large risk pool mechanisms, such as with African risk capacity. A second example was micro insurance, primarily for agricultural communities in V20 type countries; this had enabled the most exposed communities to benefit from sophisticated insurance methods. Municipal bond issuance had been seen in the US and in Johannesburg, and was a great example of how capital could be used to address water issues and other areas of resilience.

Another regulator stated that the issue of 'supply side factors' was important to consider. There had been a lot of discussion about green bonds and the financial flows that were ready to be invested in projects, but the projects needed to be available in the first place. This meant that project management capacity in the public sector would need to be rebuilt, and there would need to be good sectoral and regulatory frameworks, conducive to sustainable investments. If the projects did not come through, there was little point in having financial flows ready to be invested in them.

Another issue that needed to be considered was that of bundling. To make the transition, the EU would need to invest an additional €270 billion (or on average 1.5% of its GDP annually) over the next 4 decades². Half of that €270 billion was made up of projects related to energy efficiencies, and a lot of those projects were small projects, costing in the region of €10 million to €20 million. The unit cost of these projects was higher than for bigger projects, and there were also challenges in relation to access to finance. These projects would need to be bundled to make sure that they had access to a diversified source of financing at an economically achievable, or reasonable, cost.

There was a challenge in relation to channelling private money to developing countries

In relation to COP21 and COP22 issues, the regulator stated that there was a challenge in relation to developing countries. There had been significant improvements in terms of mobilising private finance to address climate change in developed or emerging countries, but private money to deal with climate change in developing countries was not being channelled effectively. Projects were very hard to structure; those who had tried to build up funds to address this issue had experienced a lot of difficulties, and as such this was a significant problem, especially in the context of COP22. The new Presidency would need to focus on this issue; it involved a number of other issues, such as better distinguishing credit risk and sovereign risk, and the role of NPBs and credit guarantees.

He did not think it would take a crisis to transform green finance from a 'cottage industry' to a mainstream one; although there was a lot of discussion about structural and technical issues, it was inevitable that this sector would grow. What was needed was more leadership, more coordination, and more 'heavy lifting' from an institutional perspective. Entities could not wait for investments or bankable projects to come to them.

A representative of an insurer stated that the previous day it had been ascertained that – given the low return, low interest rate, low growth environment – there was enormous demand for yielding assets that could be appropriately priced. Investing in green had moved from being an exclusion strategy to an inclusion strategy, which was a significant step forward, but efforts would need to take place to ensure that price discontinuities did not arise because of abrupt policy changes, and

that the pricing of these risks could be done with as much information and as much consistency of information as possible.

The global infrastructure hub had been set up as an education hub

A bank representative stated that his institution could help in a number of areas. Harmonisation of the G20 work and the work of the EU in relation to the non financial reporting directive needed to take place, in order to provide a standard approach for disclosure. Green securitisation was a key part of the capital markets union: there had to be a way for investors to allocate capital faster into low carbon investments and allow transfer of risk from project sponsors to institutional investors. The EIB is a leader in using public finance to lift barriers, mitigate risks, and thereby crowd-in private investors.

A representative of a different bank stated that the question of what would happen when a catastrophe occurred would need to be considered; the buy side was already provoking this question, because it was pooling together and making decisions that were structurally fundamental. The FSB's activities were also important; though its determinations would not be mandatory, it would set the guidelines for disclosure, and entities that did not disclose appropriately would not be invested in by the buy side. The representative added that pension funds needed to do more in this space: the global infrastructure hub had been set up as an education hub, to allow people to do more in this space, and had tremendous capacity. The G20 that had set it up should now make sure that it did not fail in its delivery. Cities and countries that wanted to become more green experienced difficulties in doing so, and the infrastructure hub could offer advise to them on how to obtain green finance and technical advisory services.