Transcript of the Seminar held at Guildhall on 5 June 2013

Members present:	Speakers panel:
Joan Walley MP (Chair)	Catherine McGuinness, Deputy Chairman, Energy and Sustainability (Policy & Resources) Sub Panel
Peter Aldous MP	Richard Burrell, CEO, Aggregated Micro Power
Neil Carmichael MP	Mark Campanale, Carbon Tracker Initiative
Mark Lazarowicz MP	Shaun Kingsbury, CEO, Green Investment Bank
Caroline Lucas MP	Michael Mainelli, Z/Yen Ltd
Mr Mark Spencer MP	Robert Rabinowitz, Pure/Leapfrog
Dr Alan Whitehead MP	Mike Turnbull, Bank of America Merrill Lynch
Simon Wright MP	Alderman Fiona Woolf CBE

1. Catherine McGuinness: Good morning everybody; delighted to see you here this morning. I am Catherine McGuinness. I am Deputy Chairman of Policy and Resources here in the City of London and I am pleased to welcome you all to Guildhall on this World Environment Day. I was doing a little survey before we started to see who knew that it was World Environment Day and I was very surprised that it was only me so far and that only came from listening to Radio 3 this morning, I have to say.

For those of you unfamiliar with the City Corporation, we have three key roles. We are the local authority for the Square Mile, providing local government and policing services; we provide a number of services for London and the nation more generally; and we support and promote London as the world's leading international financial centre. The rather unusual range of services we provide for the wider community includes three of London's wholesale food markets, Smithfield, Billingsgate and Spitalfields and about a third of London's open spaces, including Hampstead Heath, Epping Forest, Coulsdon Common and the other commons around the south, and Burnham Beeches. "London's lungs" they are sometimes called and I think we can legitimately claim that they were part of the start of the original green belt.

We are major supporter of the arts and we run the Barbican Art Centre and the Guildhall School of Music and Drama. We sponsor three academies in neighbouring boroughs, in areas where educational attainment was historically poor. One of those we co-sponsored with KPMG, which I see is represented here today. Our charitable arm, the City Bridge Trust, is London's largest grant-giving body, providing around £16 million a year to charities across London.

I think it is our work to support and promote London as the world's leading international financial and business centre where sustainable development comes to the fore because, in order to maintain the City's competitiveness, we need to ensure the quality of the physical environment; not just in terms of high-quality buildings and infrastructure, but also in terms of energy efficiency, resilience to climate change, good air quality—where, I have to say, we have quite a bit of work to do—and, of course, social capital, including education, creativity and a sense of community. We need to ensure a thriving economy, not just based on existing markets but one that has its eye on the future and is continually developing new products and services and working with all businesses, regardless of size and focus. This is why the City Corporation has been actively promoting sustainable and socially responsible finance for over a decade, why we were responsible for putting together the UK's submission on financial services to the Johannesburg Earth Summit, and why the Square Mile is recognised as the world's centre of expertise for low-carbon investment and sustainable finance.

The financial services industry, particularly banking, has, of course, had a lot of criticism over the last five years and that is understandable. Mistakes have been made, but a strong, successful and well-functioning financial services industry is essential to the success of our society because they touch almost every aspect of our lives, from buying a house, insuring our possessions or saving for a pension. The City has historically been at the forefront of innovative finance and I think green investment is an area where the City can truly step up to the mark and put those skills to use in developing new ways of investing that, at the same time, demonstrate its response to the question of social utility.

We, in the City of London Corporation, are absolutely delighted that the Environmental Audit Select Committee has chosen to hold this meeting here. At this point, before handing over to our Chairman for the day, Joan Walley, I would just like to offer particular thanks to my colleague Alderman Alison Gowman over there. She is an untiring champion of sustainability and it was she who initiated contact between the City of London and the Select Committee when she took a group of City practitioners to the House of Commons late last year. Without Alison, we would not be meeting here today; so thank you very much, Alison.

At this point I would like to hand you over to Joan Walley MP, Chair of the Committee, who will guide us through the rest of the morning's proceedings. Thank you.

2. Chair: Thank you very much indeed, Catherine. As well as yourself, I want to extend a very warm welcome to everybody who has come along this morning. What we hope is, for the very limited amount of time we have, we will have a far-ranging and constructive exchange. In that respect I feel a little bit like a caller in charge of some kind of speed-dating event because we have some very distinguished panellists and we also have Members of the Environmental Audit Select Committee here as well and we want to get through an enormous amount in the very short time that we have.

Just before I get into the details of what we hope to do today and say how good it is to have this relationship with the City of London, I do need to say a big thank you on behalf of Committee Members here today to the City for organising this innovative and joint event with us, and particularly to say thank you to Simon Mills, Claire Holdgate and our Committee clerks as well who put an enormous amount into organising this. I have to admit, hands up all those along with myself who did not know that 5 June was World Environment Day. Hands up. I did not see the Members of the Panel. Okay. Well, if we have done nothing else today, what we have done is perhaps put down a marker that, if throughout the globe people are looking at World Environment Day, then we too here in London—here in Westminster if I can say that figuratively—need to be doing exactly the same thing.

I also want to reflect my thanks to Alison. Alison, do you want to put your hand up so we can all see you. I know that you have to leave early. There is a lot of mention at the moment about women on boards and all this kind of thing, but I think that we have four key women involved in organising the event today and I think that is worthy of note. So thank you, Alison, for helping to bring this together and making sure that this is going to be a networking event between the Select Committee of the House of Commons and people with an interest in this agenda.

What we are trying to do today is what the Parliament has asked us to do, what the Speaker of the House of Commons has asked us to do and what the Liaison Committee of the House of Commons has asked us to do, which is to reach out beyond Parliament. This time last year when we were in the process of preparing for the Rio+20 Summit as part of the United Nations negotiations we reached out to business, to faith groups and to the voluntary sector with a special event that we organised at St Martin-in-the-Fields. That was attended by over 500 people and it gave us an opportunity to start to focus on what we wanted to press our Government to do in the run up to the Rio+20 World Summit but also in respect of what should happen afterwards and to follow up.

We decided after that event, as a Committee, that what we wanted to do was to reach out to other sectors as well and at this stage, just one day after the Energy Bill going through Parliament yesterday, I think there is nowhere that is more important than the investment community. When we look at all the things that we need to be doing on the sustainable development front, if we do not find a way of engaging with the investment community and identifying all the issues that need to be looked at and then resolved at a political level, at a strategic level, at a grass roots level and at a professional level, then we are not going to deal with the challenges that our generation faces, which is that of sustainable development and it is also that of climate change. We do feel it is particularly appropriate that you should be allowing us to jointly hold this seminar today.

I think you will be pleased to hear that we do not intend this event just to be a lot of hot air, whatever people might say about Westminster and about the House of Commons. It is about linking action to the role of Parliament and it is making sure that the task we have been given by Parliament, which is to hold the Government to account in a cross-cutting way on sustainable development issues, is done in conjunction with people who share this agenda with us. We hope that this seminar today will help our Committee of the House of Commons scope an inquiry on green finance. We are going to have question and answer sessions following each segment and we believe that that will be just as important as the distinguished presentations that I know we will have.

We shall put a transcript of today’s discussion on our Committee’s website. We want to have your thoughts and input into the issues facing green finance and our aim is to launch the terms of reference for a parliamentary inquiry as soon as we can following this, if you like, informal discussion and then to seek written evidence. We hope that all of you here today and your colleagues will not just come along on World Environment Day and think, “That is it, ticked the box. I can go away now”. We want you to engage with us. We want you to submit formal evidence to our inquiry and that is what today is all about. For the actual inquiry we should be looking to follow up on our previous Committee inquiries on the green economy, on the Green Investment Bank—and we shall be following it up with a visit to Edinburgh, we hope, in September later this year—and also on the budget.

In respect of the issues that we feel have to be addressed, if I can just list five. There is a large gap in the billions of pounds between the finance needed and the finance available for projects that help meet our obligations under the Climate Change Act and to improve environmental protection. I know that all Members of my Committee are faced with how we can get investment in our constituencies for this whole agenda. How do we get the finance to the projects that need it? Is the problem a lack of available finance or a lack of demand from potential projects? There are also issues around smaller green projects not having many options for sourcing finance. Are there enough options out there for financing these small projects? Do we need some way of amalgamating these projects into larger investment opportunities? I have been very focused with some of the work that Michael Heseltine has done in respect of investment across the UK and, time and time again, people say, “We don’t just want the really big investments to succeed, we need the smaller projects, the smaller initiatives, as well”.

Then there are the concerns about the carbon bubble and I am very conscious of the Carbon Tracker report. I think what we have to do is address this agenda and to see, if investments in fossil fuels do continue apace, what that means for tying up finance that could otherwise go into green areas and what that means as well if we are to keep our overall limits within 2º centigrade. What does the investment world feel about that? Are we going to be left with stranded assets and, if so, what can we do about it? Then there is the issue of how does Government strike the right balance between regulation and facilitating voluntary action. Where do we get the certainty from about the investment that is needed? Would greater regulation help make finance markets work in the longer-term interests of society? Where would we draw the line on that?

Last but not least there is also the issue of heightened political risk and I think as Members of Parliament, certainly my Committee who are here today, are very aware of public pressure and in any of these agendas you can only go as far as people will allow you to go. How do we engage with this whole issue about informed debate on these environmental issues? That is just a flavour of the issues that we have flagged up. I am sure there are an awful lot more because we are not the experts and we are here to listen and to see what you have to say today so that as a Committee—and I am so pleased that so many Members of my Committee are here today—we can do all that we can through proper debate to urge Government to address these most important issues.

I am going to go back to the chair and keep everybody in order to try and get through by 10.30am. I think that each of our panellists, some of whom I only had the pleasure of meeting just before we started, are going to have five minutes and I am going to start, if I may, with Alderman Fiona Woolf who is here today and I know has a lot to say and a huge amount of work in front of her. Fiona, over to you.

3. **Fiona Woolf**: Thank you very much indeed and good morning, ladies and gentlemen. I am a partner in CMS Cameron McKenna. I have been working on reforms in the energy and infrastructure sectors since before some of you were born, but certainly starting in a big way on it in the privatisation years under the Thatcher administration when we put in place a whole new structure, particularly in the electricity industry, that drove much greater resource efficiency and provided a platform for, ultimately, the decarbonisation efforts that we are now seeing.

I have worked in 40 countries on this agenda now and a lot of the focus has been to create a stable environment that is well regulated and where the policy initiatives are joined up and stable as well in order to attract the investment that the economies need and particularly to deliver low-carbon economies. The stability is all important, as we all know in this room, and I have been able to bring some of this to bear in my corporation work here in the City of London as an Alderman, largely thanks to Alison Gowman. I just basically ride on her coattails and she opens up all the possibilities for us; so thank you for that again.

As you have heard from Catherine, in our post-crash but very globalised world cities are competing directly against each other to attract investment and business and much of that competition is based on the strength of the infrastructure and the quality of life they offer. As time progresses, I am afraid this competition is going to increase. Happily we are in the forefront and one of the factors is that London is a nice place to live in and it has the infrastructure that just about passes muster with everybody.

Again, we have to sober ourselves up with the thought that, for the first time in history, more than 50% of the world's population live in cities and London's population grew by 12% between 2001 and 2011. The Office of National Statistics is projecting a further 14% increase by 2020 and we are already well down the track of getting to that date. The trend is, of course, repeated at a global level and the UN estimates that in China, for example, more than 70% of the population will be residing in urban centres by 2015. For city governments around the world, and I mean city governments and not just national governments, this growth in urban populations presents very significant challenges. The extra people will need food, housing, water, sanitation, energy, waste and transportation. These needs will be framed by a resource-constrained warming planet inhabited by some 9 billion people.

All this is a call to action but it is a great opportunity for the City of London and I think it is a great moment to be here because rising to challenges is something that has kept the City on its mettle for not just decades but centuries and we can't afford to lose our competitiveness as a place in which to live, work and do business. As we all know in this room, we are asking the question: where will the finance for this infrastructure investment be found? I know other panellists will talk about this and come up with ideas, many of them very practical, there is a lot of work going on and certainly the financiers are the implementers of best practice and experience all over the world on a bespoke basis.

Then there is the question of how we manage the financial and physical risks effectively and, importantly, how resilience can be built into the urban development. The global knowledge and expertise that is collected and brought back to the City that I have mentioned is very well placed to help us to tackle these problems. The UK Financial and Professional Services is an asset not just for London—they are a very important asset for London—but for the nation as a whole and they can offer expanding cities of the developing world the complete package, because we are known for particular strengths in construction and engineering and infrastructure services.

Certainly I admire the architects and engineers in the way that they get it and do it, but I think that we should not underestimate the way in which the much-maligned banks and players in the capital markets get it and are doing it as well and I hope to have an opportunity to showcase more of that as next year unfolds. There are also, I have to say—a plug for my own profession—legal services that have been brought to bear all over the world, but I think we are thinking of new models for writing very long-term contracts that can withstand the vagaries of renegotiation better and prepare people for what Michael Mainelli calls VUCA—volatility, uncertainty, complexity and ambiguity—and help to make our clients VUCA-ready, if I can coin that phrase. Then we have all the risk-management and insurance services here to ensure that resilience is built in.

I am probably running to the end of my time, but I am delighted that you have started this inquiry and we have a very long history of being pioneers in the field. My view is that the City of London is going to survive by being tomorrow's city rather than yesterday's city or today's city, but there is a great deal of what is happening and needs to happen tomorrow that is already going on today. Thank you.

Chair: Thank you, Fiona. I did give you a little bit of a special dispensation but I know that my other three colleagues on the platform want to very strictly stick to the five minutes. At this stage, with a very warm welcome, can I hand over to Shaun Kingsbury, Chief Executive of the Green Investment Bank?

4. **Shaun Kingsbury**: Thank you very much and welcome this morning. I promise I will run through this quite quickly. What I want to do with my introductory comments is introduce the bank, what we do, what we are all about and how we think about these things. Our role, our mission in life, is to catalyse private sector investment in renewable energy and energy efficiency. We are not going to be able to do all of this ourselves. Our role is to catalyse other folks to do it. We have £3 billion of initial capital from the Government. That is capital we can invest and we can use and we can recycle and eventually raise some more, but that is a small drop in the ocean compared to the size and the challenge. The UK needs to invest close to £200 billion over the next 10 years to hit its targets. About £110 billion of that is into new low-carbon generating assets and supporting infrastructure. If you do the maths and, being very simple I like to divide by 10, that is £20 billion a year to be invested. We are investing at about 40% to 50%, about £8 billion to £10 billion a year going on at the moment. So there is a bit of a gap.

We have in our strategy this concept of a double bottom line and that is a return on our capital. We are a for-profits bank. If there is one thing you take away from today's introductory comments on the bank it is we are a for-profits bank, but we also have this concept of a double bottom line; a green bottom line. We have all spent many hundreds of years developing accounting rules for how you might talk about our profitability, project IRRs or return on capital or EBITDA, but we are developing the language and the skills and the matrix around discussing and measuring a green bottom line; whether that be avoided tonnes of carbon or whether that be avoided waste to landfill or whether that is renewable energy generation, but we have this concept of a double bottom line. We are focused on projects that are green and profitable, not green or profitable.

We must be additional. What do we mean by that? We look at projects that have the right type of backers and the right type of structure, but are struggling to raise all of the capital they need. We invest alongside private sector investors to get those projects across the line. Our job is to crowd in capital as a result, not crowd out capital; so we always have to be additional. We can invest wherever we like in the capital structure around projects. We can invest in equity, in debt, in mezzanine. We can provide guarantees. We can do more or less anything we like with regard to how we invest as long as it provides an adequate return for the risks we are taking, but it does mean that we are not a lender of last resort. We do not provide soft loans. We do not provide grants. Everything is done at market rates.

We can invest only in the UK. This is where we focus. We are not investing overseas, we are focused here in the UK and we are looking at projects throughout England, Wales, Northern Ireland and Scotland. We have a series of sectors we have to commit 80% of our money to. This is all defined by our state aid clearance from Brussels. So 80% of our capital has to go into waste recycling, waste to energy, offshore wind or energy efficiency, and 20% has to go into our non-priority sectors of biomass, wave and tidals or wet renewables, or carbon capture and storage.

So far we have been up and running about six months. We have about 75 to 80 people spread between our office here in London, which is down in Millbank, and our headquarters in Edinburgh where we will be looking forward to seeing, hopefully, most of you in September when we will talk a little bit more about the Green Investment Bank. In the five months to the end of our first financial year we completed 11 transactions and supported BIS in its investment in GreenCo capital. That was £635 million of commitments. The total size of the projects that were therefore moved forward, which were previously stuck, was £2.3 billion. The ratio is 1:3 of our capital versus private sector capital. We are providing about 25% of that.

We are up and running. We are making investments. We are focused on some of those smaller areas. We talked a little bit about the challenges, Joan, in some of your opening remarks about the smaller projects. We have set up four funds that we have corner-stoned with between £30 million and £50 million to look at the waste side and on the energy efficiency side where there are lots of small projects; projects which are in the £5 million and £10 million of investment capital required, where we focus on the £25 million to £50 million and have made advancements and commitments up to about £100 million. That is a quick introduction.

Chair: Thank you very much indeed, Shaun. We will move straight on to our next speaker, who is Mark Campanale from the Carbon Tracker Initiative, who will be speaking about the carbon budgets.

5. Mark Campanale *[material in accompanying slides is at end of this transcript]***:** Yes, thanks very much. My name is Mark Campanale. My background is having trained in agriculture at Wye College. I then went into the City of London. I spent the last 24 years in asset managers, such as Jupiter and Henderson, focused on green finance. I set up Carbon Tracker in 2009 to look at one thing, which is the flow of capital to the fossil fuel sector, in the context of understanding carbon budgets. Our goal is to get capital markets aligned with a 2º world. The burning of fossil fuels contributes to emissions, particularly carbon dioxide. In the last 10 or 15 years we have burnt enough fossil fuels to increase CO_2 to the equivalent of the previous 300 years of burning.

This is accelerating and as this is accelerating, as this graph shows *[slide 1]*, the CO_2 sits in the atmosphere. Once you burn it, it sits there for about 200 years. Now, if you do that you rapidly go towards your 2º and 3º of warming. What our analysis did—and you can see this on our website and the MPs should have copies of the reports on your seats—is we took the top 200 companies listed on the world’s capital markets, including London and New York, that own fossil fuels, the coal, the tar sands and the oil. We then looked at the reserves and looked at what the CO_2 was in those reserves; so future emissions. Then we looked at a notional budget. How much of those reserves can you burn if you want a 2º world? Now, at 0.8º of warming, which we have seen against pre-industrial levels today, we have already seen 70% of the ice disappear from the Arctic. At 2º we are looking at very significant damage.

Just to look at these circles *[slide 2]*, if you take the pink, this is the *[225]* gigatonnes of CO_2 that you can burn to keep to 2º warming. If we look at the little circles above, let us look at the purple one, the 762 gigatonnes is what is owned by the public companies listed in London and New York and around the world. The 762, which is what they own, is significantly greater than your budget; so the two do not go together. Now, how much more of it can you burn if you want 3º of warming? Clearly that is what is represented by the yellow line *[319 GtCO2]*. It is not significantly greater than the pink budget. The capital that is being raised every day in London and in New York and elsewhere to finance the fossil fuel industry is the next big phase of new financing for that sector and these are what are called resources; so the stuff that is in the Arctic that you are finding now for the oil, the shale gas, the tar sands and the coal.

These we call resources and there is 1,541 gigatonnes that is being financed today and in the next five to ten years. What we have is the capital markets are on a trajectory to take us significantly beyond 2º unless we align that back and this takes into account the fact that Governments own most of the reserves. Where does it sit? We have gone exchange by exchange, company by company, to say what are the global centres for the fossil fuel industry today and where does the fossil fuel sit. There are three bubbles or three circles *[slide 3]*that you can pick up there: Moscow, London and New York. The black represents the oil, the grey the coal and the blue is the gas.

If we can move on to the next one *[slide 4]*, we estimate that $650 billion is being raised each year to expand the fossil fuel sector through London and New York. This slide shows you how this very quickly changes and London switches from being a bit of an oil and gas centre to being the coal centre of the world along with the Australian market. New York is in a better position because it has more oil, which is more likely to be burnt. This creates a contradiction, which we call the carbon bubble.

To the next slide *[slide 5]*, here are the capital flows. Now, let us put it into some kind of context. On the left we calculate that the top 200 listed companies of oil, coal and gas represent around $4 trillion of equity and each year $674 billion is spent on developing more reserves, which gets you to your 1,500 gigatonnes and they pay back, in terms of earnings, $927 billion, which goes back in the form of dividends or to repayment of debt. Now, the other way of looking at this is over the next 10 years the companies will be tapping pensioners in the UK and obviously the US for around $7 trillion to expand the fossil fuel sector. We call our report *Wasted Capital* because what happens if you can't burn all that coal and all that oil is you lock in coal infrastructure in terms of energy and power stations. You lock in mining. Obviously, once you have done that and built that infrastructure, that capital is not coming back. It is wasted. What else could you do with that $7 trillion over the next 10 years? Could you put it into renewable energy or to energy efficiency?

What Lord Stern said is that there is a contradiction here between the valuations. Now, the valuations of these companies is based on the assumption that you can burn all the oil and you can burn all the coal. If you can't, and we say 70% of the reserves will have to stay in the ground, then the valuation of these companies is wrong. The *Financial Times* reported this week that two-thirds of the revenues of the FTSE 350 is based on three sectors: finance, oil and gas and mining. If these valuations are wrong then we are putting our banking system and the London capital markets at risk from significant changes to the fossil fuel demand.

Do we want to bet the banking system on expanding coal and oil? Maybe we can because that is what the market is doing, but maybe we need to reflect on that and put in place the measures to avoid that. Our recommendation is that we should get companies to disclose future emissions, both the CO_2 and the reserves, and that regulators such as the Financial Stability Committee of the Bank of England should report publicly on how they are managing this contradiction.

My last slide *[slide 6]*, so we do not get out of time, what we are doing is we have recruited some of the City's leading analysts to work with us, from HSBC and JPMorgan, the climate specialists, to start rerunning the numbers and we have a series of projects looking at financial stability, looking at valuation scenarios, looking at policy and looking at the capital-raising process. If you want to raise money for coal in London you do not have to disclose climate risk. In fact, very rarely in the IPO documentation do you have anything about climate risk in those documents. So this is what we are focused on doing as a project and we are not-for-profit backed by some key foundations such as the Tellus Mater Foundation and the Joseph Rowntree Charitable Trust. Thank you very much.

Chair: Thank you very much indeed. There is a lot of food for thought there for future action and you kept within the five minutes. Now, on this panel our final contributor is Michael Mainelli from Z/Yen Ltd who will be speaking on sustainable financial systems and products. So over to you, Michael.

6. **Michael Mainelli**: Thank you very much, Joan. My remarks are really directed at three areas where I feel that policy and finance can link. The initiative that I am representing here is Long Finance. Back in 2005, with the City of London Corporation, we initiated a joint research project with 24 firms in the City. This is 2005 before the Turner Review was commissioned. In 2007 we published an 800-page report at Mansion House. That initiative has grown remarkably to well over 50 institutions and nearly 400 reports that are available to policy-makers to see what finance thinks about government policy and initiatives.

Anyway, I think it is very reasonable, as Joan opened, to ask: how can investment be bent towards sustainability? Investors already acknowledge very clearly two big themes, population growth and resource scarcity, but there are two obstacles that I see as paramount. One is policy mistrust and the second is information gaps. It may be difficult to point out how much investors do mistrust bringing forward investments based on government policies. The EU ETS is a notable example. Biofuel policies, feed-in tariffs and carbon pricing have all been introduced summarily and ended and sometimes withdrawn. The highly centralised Government of the UK provides great flexibility but sometimes facilitates capricious behaviour such as windfall taxes. So if Government policy is the most common route to internalised environmental externalities, this changeability bodes ill for long-term investment in sustainability.

Now, there are numerous suggestions for also improving the information gaps. Moral suasion is quite common but this is unlikely to result in rational investment allocation. More information tends to take the form of campaigns for greater disclosure and I certainly can't object to any of those, but more information is not necessarily better information. I think this leads to perhaps the first policy recommendation that I think ought to be discussed more and that is enlarging the existing big data initiatives the Government has undertaken; widen that to include things such as the Natural Environment Research Council information and satellite imagery, and be aggressive about that.

The second proposal that has been coming out of Long Finance will sound slightly technical but it is, I think, fundamental and very related to Mark's remarks that the information analysis that is currently being presented is misleading. This initiative is called *Confidence Accounting*. It is a proposal to use distributions rather than discrete values where appropriate in accounting and auditing. This could allow firms to indicate on their balance sheets their environmental sustainability risks and to present those reasonably. This initiative has been supported by the Association of Chartered Certified Accountants and the Chartered Institute for Securities Investment. Sir David Tweedie has come behind it and Andy Haldane, Executive Director of Financial Stability at the Bank of England wrote the foreword, so there is much more information on that. A subtle but, I feel, very important change that would allow us to incorporate some of the empirical carbon points that Mark made.

Finally on Government policy, the Long Finance of London Accord community have a simple, almost subversive proposal and in a moment I will give you a climate change example but it could be directed toward water, forestry or other sustainability issues. The idea in climate change is an index-linked carbon bond. This would be a Government bond very similar to an inflation-linked bond that was indexed to levels of interest based on a carbon target; for example, levels of feed-in tariffs for renewable energy, emission certificate prices or actual greenhouse gas emissions of the issuing country. So an investor in an index-linked carbon bond receives an excess return if the issuing country's targets are not met; for example, an extra percentage point of interest for each euro that CO_2 emission certificate prices are below a target, or an extra percentage point for every percentage that the UK Government has failed to induce renewable energy. The proceeds from such a bond are not hypothecated, however. They are for general Government expenditure and investors can use these bonds effectively as a hedge on Government policy and Government policy risk. There is considerable scope, I think, to use these types of bond cuffs for other sustainable policies, water biodiversity and so on.

For investors, I think what we have are two big issues. "The money is there". I disagree with that. As Mark quite eloquently pointed out, the money is flowing. It is just flowing in the wrong direction. Three policy things. One is to enlarge the data. The second is to promote the use of confidence accounting, a gentle policy note. The third is for the Government frankly to put its own money where its mouth is and say, "Yes, we are absolutely committed to these targets and if we fail to make them you will be compensated but why don't you bet with us". Thank you.

7. **Chair:** Thank you very much, Michael. I think we have 15 minutes for questions and what I will do is start, first of all, with my fellow Committee Members and then questions from the floor to our panel members here. We have two roving mics, so whoever wishes to catch my eye first of all.

Caroline Lucas*:* Thank you very much. I had a comment and a question. To Shaun, it was great to hear that the Green Investment Bank is up and running. It has been an issue that the Environmental Audit Committee has been following very closely and I completely appreciate what you are saying about the importance of profit being absolutely up there as well as green and to be able to demonstrate that it can work in economic terms. My comment was just to wish you well in the ongoing bids for the ability for the bank to be able to borrow in the future. I was just going to note the constrained funding of the bank and comparing that with the £50 billion that was made available by the Government through the infrastructure guarantees under the recent Infrastructure Financial Assistance Act. It does seem as if, when the political will is there, some more can be done; so I wish you well with that.

The question was to Mark on the Carbon Tracker report because I have raised this with Ministers a number of times. I have held an adjournment debate. I have put questions to Ministers and their get-out-of-jail-free card appears to be a somewhat unrealistic faith in [Carbon Capture and Storage] and I just wanted to invite you to talk about what happens to your scenarios even with CCS, because I think it is important that we have that on the record too.

Peter Aldous: Two questions, first of all to Fiona Woolf. She emphasised the importance of stability. In green investment terms, how is Britain viewed internationally? Secondly, to Shaun Kingsbury, before the Green Investment Bank was formed I think it was Bob Wigley who did quite a good report on it and he was emphasising the need for quick returns and concentrating on specific areas to make an impact and get off to a flying start. Is he concerned that he is spreading his resources too thinly? Secondly, I would be interested in the importance of leveraging; how he thinks the Green Investment Bank is performing in leveraging in private sector investment to his counterparts in Germany and the Netherlands.

Mr Spencer: Just as important to the City of London in terms of carbon is security of supply and continuity of supply and I just wondered if you would like to comment on the effects of some of these changes that might happen in terms of our energy security and how you rate that in terms of importance?

Chair: Thank you. I will bring Mark in to respond to Caroline's point and then the rest can come in.

Mark Campanale: Yes. It is detailed in our report. The IEA say there are about 16 projects of carbon capture and storage, experimental projects, today. In an idealised scenario, you will have to have 3,500 projects up and running in the next 20 to 30 years to have any impact on emissions. In that ideal scenario, if you do get these 3,500, 4,000 projects around the world, this will only increase your budget by about 20%, so even with CCS, you still have a huge problem with emissions and increasing carbon dioxide in the atmosphere.

Chair: Thank you, Mark. Fiona, did you wish to respond to this?

Fiona Woolf*:* Yes. How are we viewed internationally from the point of view of stability? Certainly in the electricity sector, not well. It has had a chilling effect on investment, and as you know, it is a very international sector. As far as the networks are concerned, the natural monopolies, we have seen quite a lot of interest. For example, the networks underneath us are owned by Hong Kong now and if you talk to them, they say that they think that we are fairly high up on the stability level in world terms. Recently, the water company I am a director of changed hands and there was a lot of interest in it. So I think it is more about people are quite comfortable with the way that our regulators go about things, even though those of us who advise regulated companies don't think so.

Shaun Kingsbury*:* Let me respond. I think the question was around the Bob Wigley report, which was set out at the beginning, not to have a strategy that was a mile wide and an inch deep, and I think with the restriction that we have on putting 80% into the four key priority sectors, we have a really keen focus. If anything, I probably could look at other sectors that we cannot invest in at the moment. For example, we can't invest in solar; we can't invest in onshore wind; we can't invest in regular hydro. So I think we have a good balance at the moment. I think we could do a little bit more. We have a big team, probably the biggest renewables team in Europe, sitting at the Green Investment Bank and I think we can do a little bit more than we are doing today.

With regards to the leveraging in the private sector money relative to our own capital, for the first series of investments, the ratio is one to three, so we are providing 25% of the total capital. Will that get better or worse? It depends where we end up putting the money. If the capital flows back into some of those markets, we may end up having to look at more tricky and smaller transactions where there are fewer people who are willing to invest alongside of us and so that ratio may shrink. If we are able to invest in things like offshore wind successfully and create real comfort for the investors, that they can come along beside us, we will have to put up less of that capital, and over time it may grow. So it is really hard to predict from the first six months of operations of the Bank, but it is a clearly a metric we are watching carefully.

8. **Chair:** Thank you, Shaun. If I open it up now to people who wish to catch my eye. Could you say who you are and try and be brief with your questions or comments?

Andrew Raingold: Thanks, Joan. Andrew Raingold, Executive Director from the Aldersgate Group. Yesterday in Parliament, during the debate on the Energy Bill, MPs narrowly lost the vote on the decarbonisation target that businesses have been very vocal in supporting, particularly those businesses who would like to invest in UK supply chains and UK jobs, and they are facing a bit of a cliff edge after 2020 because there is lack of certainty. I just would like to hear from the investor perspective as the debate moves into the Lords in a couple of weeks' time, how important do investors see this target as providing just a bit more clarity on the direction of travel for low-carbon energy systems?

Gary Hayes*:* Hi, Gary Hayes, HGEN Capital. One for you, Shaun: we are looking at going offshore and we are seeing so many people coming back onshore. What is your response to that?

Mark, the weather is caused by the solar wind, and looking at the variables, you have to be very careful in interpreting what is going on. What is your response to that?

Alison Gowman*:* Alison Gowman, a member here, Alderman in the City of London. Speaking I suppose with a slightly local authority hat on, we do have large pension funds that we, as all local authorities, are investing, and how far do you think that local authorities and other major investors are seeing green finance as just another add-on in a slightly separate silo, and how far should it be really part of the whole mix, engrained and underlying all investments by pension and other major investors?

Chair: Thank you, Alison. Who wants to come in first? Shaun.

Shaun Kingsbury: Shall I have a go at the one that was offered to me, plus the 2030 target? I think a target for 2030 is obviously helpful. It gives direction and comfort. I think the key issue for me is to make sure that we get the [Electricity Market reform] right in the next couple of months. I think that will be the area of focus that the investors really think about in the first few projects, and if we can get the EMR right and we get the strike prices right and the contracting counterparty right and all of the pieces that need to come together to form a holistic solution to this, people will start to invest, because they have projects queued up. Once we start momentum and people see that it is possible to make adequate and decent returns on those investments, they will get more and more comfortable with it. So my view on 2030 target, it would have been great if we had been able to get that, but if that is now a moment that has passed, let's focus on getting the EMR right and we can get some traction and momentum.

Then let me come on to the comment on offshore wind. So offshore wind, of all of the sectors that we focus on, is the one that needs the most capital. It may require £20 to £50 billion of capital, depending on where you think we are going to get to, between 10 and 12, 18 GW of offshore wind produced. It is a new sector. What we have been trying to do is focus on creating a secondary market, initially for operating assets, allowing the utilities who wish to recycle their capital that they have invested and the risk they have taken in the construction back into constructing the next round of projects and to really focus on supporting people coming in and buying operating projects.

The great thing about renewable energy projects is that as investors are looking for yield these days, these are projects where most of the capital goes in upfront. They are huge generators of cash. A lot of that is index-linked to inflation, so they have the right kind of long-dated cash flows that meet the obligations of insurance and pension funds. So what we want to do is to bring those investors in by investing alongside them, creating a secondary market, recycling their capital back into construction, and we will put some money into construction too, and trying to bring people in. So if they would like to start to invest in that sector, we would be very happy to sit down and talk to people about how we could co-invest alongside them and give them some comfort.

Fiona Woolf*:* Can I also pick up on yesterday's failed vote, if I can call it that? It does go back to the question of stability. I agree entirely that part of the chilling effect on investment has been the lack of certainty around EMR and the strike price, but I think there is something that somebody said to me at breakfast, which is that getting the policy initiatives and the policy decisions joined up with the regulatory initiatives and joined up with the implementation—and there are lots of different organisations who are responsible for a bit of it—would go a long way to creating a stable environment.

Can I deal with Alison's question about pension funds, and particularly I guess the question was should local authorities be engaging their pension funds in this agenda perhaps more intelligently or in a targeted way? Of course, we are very blessed to be the recipients of pension fund investment from Canada and the United States. I do not know what it is about teachers, but they all seem to have very well-run pension funds that are not necessary in deficit the way that some of ours are. I think that it is a very good point, and we are seeing some very interesting and different models for financing urban infrastructure, which is what I talked about, coming out of Germany and the Stadtwerke, who have perhaps a bit more autonomy than some of our authorities do, but they look to engage both their assets, their operating knowhow, their authority to grant planning permissions and their closeness to their communities in a way that is a completely different model for a public private partnership at city level.

Mark Campanale: Yes, just to address the questions of what investors can do, HSBC's oil analyst suggested that companies should increase the dividends, fossil fuel companies should increase the dividends they pay back to pension funds, instead of investing it and developing more fossil fuel resources. Now, with the increased dividends, pension funds will be in a position to diversify their portfolio into renewables and we would certainly encourage that. The rebalancing of their portfolios to renewable energy infrastructure would certainly help us achieve some of our targets.

The second thing that we are asking investors to do is test the valuation assumptions of their portfolio, particularly their equity portfolio, to coal and tar sands, because if they are wrong, then there are questions here for the allocation of capital. So there are a couple of things that we would like pension funds to do. Ultimately, what we need to do is realign the capital markets, of which London is a major centre, to help create the sustainable energy systems that we need.

9. **Chair:** Thank you, Mark. I will take three more.

Gordon Edge*:* Thank you. Gordon Edge, RenewableUK. There has been some talk about pension funds already and that the nirvana seems to be for pension funds to ride in with their billions and be the long-term owners and kind of save the day, but my perception is that there is a double problem here. One, you have to persuade them to invest in infrastructure at all, and then secondly, you have to take the next step of doing green infrastructure. Does the panel really think that the pension funds will be riding in and being the cavalry and saving the day here?

Samantha Heath*:* Yes, following on from that, my name is Samantha Heath from London Sustainability Exchange. Shaun talked about the double bottom line. We work on the triple bottom line, which is talking about the social elements as well, and what I would like to begin to exercise—which could be a Noddy question—it is about where you can't get a return on things that we desperately need. Mark talked about 2º. We have climate change that is already with us. We serve on the Climate Change Partnership in London that looks at adaptation. We are finding it very difficult to get people to invest in adaptation, things that we desperately need but there is little return. There could be some technologies for windows to get some decent shading, but how do we get investment into things that really do not give a long-term financial return, but we desperately need it in order to secure not maladaptation?

Richard Templer*:* I am Richard Templer from Imperial College, and the Climate-KIC, which is a pan-European innovation community in the climate change area. In fact, my question was a follow-up to the penultimate one, which is you have talked about mitigation; there is a lot of concentration on that subject. Adaptation tends to be the ignored component and I think that is rather dangerous, because the effects, according the science of extreme events, are going to happen first. We are going to see those things hitting us quite regularly over the next few decades. An example that I would give and would ask you to comment on is that the insurance sector is looking at about 200,000 buildings in the UK that it is thinking it really can't insure any more because of flood risk. It has come to this stand pass because the Government is meant to have a deal with them in which it works on securing those infrastructures and it is not doing it. This has now reached a very critical moment. I think over the next six months, something is going to have to happen. So there is clearly a schism between national funding and what the private sector, the insurance sector, is willing to do. So the question is what can the money markets do? What can finance do to try and bridge that gap to commercialise, if you like, adaptation?

Chair: I will bring Fiona in first.

Fiona Woolf*:* Okay. As you raised the question of whether pension fund trustees pay attention to the green agenda, I will tell you a chilling story from a think tank called Tomorrow's Company, who ran a survey of pension fund trustees and asked them if they routinely took into account ESG outcomes—environment and social governance outcomes—in their investment strategies. They said, "Well, we don't know. You have to go and ask our asset managers". So they ran the same question past the asset managers, who said, "Well, we couldn't possibly do that unless we were specifically instructed". That is, in a nutshell, what the outcome had been. So they are doing some work on the alignment of incentives in capital markets. However, I have met some pension fund trustees who absolutely do get it.

As far as the investing in adaptation, I think it is a big issue for us here in the City with the carbon footprint coming largely from our old buildings. I am surprised that nobody has asked any questions about the Green Deal, which is another issue that we will not go into. However, I will not go on and I will let other people come in.

Michael Mainelli: Yes. It is really on pension funds and stability. Obviously my theme here is finding ways of making the Government commit and prove its commitment, not to have targets and things that, frankly, don't bear any problems when they are overturned. I agree with Fiona's point totally that most pension funds do not care, and the reason is that they have to manage scenarios: a high-carbon scenario and a low-carbon scenario, and therefore they have to bet on both of those, and Mark's numbers tell you pretty much how they are betting right now. It is pretty clear. So they do not believe Governments; that is really the case.

Things like CCS, oddly, cause different problems. You are basically building two power plants at once. Are you going to see energy prices double? I do not know. That is a very simple engineering answer to something that was also contained in a report that JP Morgan did for us back some five, six years ago that Ministers did not like. So you have this difficult problem of trying to manage two, and we need to find ways of locking down one of those scenarios, the high-carbon scenarios is really not very attractive. That will move the pension funds.

I will give you just one quick positive tale: working with one of our clients over the last four or five years, they agreed that they needed to decarbonise and they are pretty much down to the minimum that they can get to in coal—that has been a five-year programme, you just do not hit the markets and say, "I am getting rid of my assets"—and we were sitting there just the other day discussing Mark's report, and the risk team has finally agreed that Mark's report has validity and that they are over-exposed for the long term to oil assets, so they need to start moving out of those. So people are recognising it, but they have to sit there and think to themselves, "Yes, but where is Government putting its money?" and it is putting it as least as much into the high-carbon scenarios as the low.

Shaun Kingsbury: Look, let me respond, Gordon, to your question around pension funds and just build on the comments Fiona made. They have capital that they like to invest, but they will not invest because it is green, because they like the UK, because they think that their pension holders would like them to do so. They will only invest if they make an adequate return, and so part of what we need to do at Green Investment Bank is to drive those returns. We often get challenged on do we have too much of a focus on profits, but what we want to do is build an enduring institution, an institution that is here the next 10s of years, maximising its green impact on the environment and bringing in other capital. The key to that as a bank is capital formation, and that capital formation is only possible on the back of profits. We have a unique opportunity to show people—because it has been hard to make money in some of these markets—that it is possible to make money in renewable energy in the UK.

Of course if we fail miserably, it is going to put it back many, many years, so we need to stay entirely focused, with a laser focus on delivering profits at the bank to crowd in that extra capital, to have capital formation and build an enduring institution and to maximise that green impact over time, and so profits are the key. We have to be green and profitable, not green or profitable. Any woolly thinking around giving away money just does not work. It will continue to show that these markets don't work unless you show a return.

Mark Campanale: Yes, I think for pension funds, who have a duty going out 20, 30, 40 years, they have to ensure that the investments they make take into account different types of risks and the expectations that their investments will generate the returns needed to meet liabilities. Now, at the moment, in a changing climate, we don't know what the stresses will be on the pension funds for their exposure to real estate. You mentioned insurance. With the billions already lost from weather damage, what is the effect on the insurance exposure and their agricultural investments? So what we have to do is look at risk in the round and ensure that you take into account what potential impairments will affect other parts of your portfolio. We can't have a situation where all your fossil fuel investments will win, however, that means your real estate investments will take a loss, so we have to look at risk in a balanced perspective.

One of the other things we can do, and pension funds can add their voice, is to remove some of the perverse incentives that exist in the market. The most obvious one is the OECD—I think it is—estimates around $300 billion a year subsidies to the fossil fuel industry. Now, if they were removed, that would somewhat rebalance the case for supporting investment into renewables by removing these subsidies from the fossil fuel industry.

Chair: All right, thank you. Now, at this stage, it is going to be all change, so if I can thank our panellists and invite the next three panellists to come and join me on the top stage, please.

With no further ado, I want to move on. I think we have just touched a little bit on the practicalities of doing something of what we are talking about, and our next three panellists are going to each have five minutes. First of all, I would like to hand over to Richard Burrell, Aggregated Micro Power. Thank you, Richard.

10. Richard Burrell: Thank you very much indeed. I want to talk about three things today. One is some comments on the Green Investment Bank; secondly the DNOs, or the Distribution Network Operators; and thirdly, the Environment Agency and planning.

Before I do that, I will just give you a bit of background on who I am. I am Chief Executive of a business called Aggregated Micro Power. We are about developing, owning and aggregating small-scale energy facilities in the wood to energy and waste to energy sectors. We believe passionately in distributed generation, giving energy security locally to users, commercial users, of electricity, heat and power and we believe that takes the pressure off the transmission networks and related large-scale schemes. Our business can operate in every local community and we believe by doing what we are doing, over time and aggregating this, we can provide cheaper sources of fuel and electricity. Finally, we are passionate believers in closed looped energy systems, where energy from waste is a classic example.

However, first, if I could just turn my attention to the Green Investment Bank, and I listened to a lot of the comments and the presentation. I think the issue with the Green Investment Bank is it is more of a co-investor, rather than a bank. I come out of a background—I have only been in renewable energy for about three years—of building doctors' surgeries. Now, for those of you who do not know—I am sure the MPs will know it, because it is quite a topical issue in their constituencies—doctors' surgeries or primary care centres have 100% Government subsidy in terms of the notional rent scheme, and what the Government did in the early days of the notional rent scheme is that they created a business called GPFC, which was basically loan finance for doctors to be able to build their doctors' surgeries using the subsidy. This is what should happen in small-scale energy facilities.

If the Government was to stimulate the Green Investment Bank to be a genuine lender at the small scale, along the lines of GPFC, you would have a lot of community projects, a lot of small aggregated projects being able to source development finance that basically does not exist at the moment, and then be able to put those development loans into long-term lending on those schemes, which ultimately can then be sold to the pension funds. The point was not made that they only want to invest in big ticket items; they are not interested in small-scale schemes. So you have to aggregate these and you have to put them into a pool of assets. That is exactly what GPFC did and it has been very successful in primary care, in the development of modern doctors' surgeries today. So I would encourage the Government to look at that as a model for this sector.

On the Distribution Network Operators, all I would say is a plea that they need better regulation. Trying to get a grid connection on a small scheme is a very painful, onerous task and they should be regulated to very fixed times of response and very fixed tariffs of connection. It is rather chaotic at the moment. It makes it very, very difficult to move schemes forward fast and efficiently.

On the Environment Agency and planning, the key issue there is that the Environment Agency needs to regulate technologies, not science, so if you have a really good energy from waste facility that has been through Environment Agency testing and you want to roll that out nationally, you don't need the Environment Agency to come back every single time. The planning system can deal with the issues around local concerns and all of that. The Environment Agency should be about regulating the technology.

The final comment I would make, and this is a suggestion to all of those who look at Government-owned land and assets, who really are serious about pushing energy from waste, which we are passionate about, all redundant Government land—and there is a lot of it—should be fast-tracked through planning for energy and waste projects. Thank you very much indeed.

Chair: Thank you very much indeed. I think we are really getting down to the practicalities of all of this now. My second panellist now is Mike Turnbull, Bank of America Merrill Lynch. Over to you, Mike.

11. Mike Turnbull: Thanks. I will be brief. I work in Bank of America Merrill Lynch. I run the European infrastructure financing business, so I am responsible for the actual implementation of lending, hedging and providing financial support to the investment in infrastructure generally, and obviously in green infrastructure in particular. I am also part of a team who helps gets equity investments into those projects as well. We were not in this business three years ago, and we have gone from a standing start to a 6 billion or so, 4.5 billion to 5 billion net exposure position in the overall infrastructure space, and a subset of that is obviously the green infrastructure.

This is part of a broader strategy that we have at Bank of America Merrill Lynch. We have invested or helped facilitate the investment of about $21 billion into the green economy or the transition to the green economy since 2007 and we intend to invest up to $50 billion over the next 10 years into that space. So we are trying to put money where our mouth is on all this, and all of that obviously on a financially viable basis.

My operation is across Europe, so I am very aware that all the investors that I associate with, whether they are debt or equity, are global investors and they are looking to invest in a market that is a global competitive marketplace. So UK green investments are competing with the investments around Europe and the world, and that is a very competitive environment. The bulk of the money that I am talking about, although a lot of it does come from UK pension funds and insurance companies, there is an enormous amount of money coming out of the Canadians and Germans, the US, the Australians as well as the Japanese banking system and other places. So the amount of money available is large, but the competition is extremely intense, and that is a very important element of the puzzle here.

I am obviously particularly involved in the process of financing projects and very sensitive to the process of de-risking projects. We want to move pension insurance money into these assets. They are long-dated, stable cash flows, they are inflation-linked, they are ideal as part of an asset liability management programme. However, there are risks such as construction, and the early day operations of these assets, particularly offshore wind, are very challenging, and I think that the reality is you will not get these guys investing day one. We need to stimulate a process of recycling capital, where the specialist developers, the constructors in the large energy companies, put the initial investment in and then they are recycled out of those assets into the next wave. We are seeing that starting to happen in offshore wind as the third generation of the wind farms come on, but it is a very challenging environment.

Just to close—and I am conscious of time here—four observations. What we need to stimulate this process and to get the investment programme moving more efficiently is, I see, four elements of a stable environment. One is a stable and consistent over-arching energy and transportation policy. I think the Government needs to be clear and consistent about the importance of the green element in that energy policy. We have obviously had enormous numbers of back and forwarding by various Governments over time on that, but I think consistency there is essential. I point to things like removal of PFI status from waste to energy plants in the UK recently as very telling practical events that damage our consistency. I would support the investor fund regulation, we need regulation that is consistent and is not changed with political whim. Whether you want to improve the environment for the consumer against the investor, whatever you decide to do, you need to do it on a consistent, understandable and manageable basis.

I would point to an interesting event, when the Northern Ireland regulator for gas moved to adjust the pricing policy for its gas, and that was overruled by the Competition Commission, they cited very clearly the damage to international inward investments to Northern Ireland by the movement by the regulator on pricing. I think people need to be very aware that regulation does have a direct impact on the investability of these sorts of projects. We are seeing a period now, whether it is electricity, gas, water, where the UK is, I would say, almost falling into line with other regulatory environments, where there is more instability and less consistency around pricing and therefore the investment model behind those networks and behind the investment in projects that support the growth of those networks. We are seeing it all over Europe, we are seeing it in Norway, we are seeing it in Germany, we are seeing it in Spain. It is not just the UK, but that does damage confidence in investment in the long term. Pension funds and insurance companies want to invest in transparent, sustainable cash flows and regulatory instability or lack of consistency—and we have been renowned as one of the most consistent and one of the longest-standing regulatory environments for energy, particularly electricity and water—and there is more anxiety around that now that there has been for some time.

So the third point is joined-up policy implementation and alignment of incentives. I agree with various panellists about this. We need to make sure that the incentives for investment are aligned with the policy, and at the moment they simply are not. We do not have time to go into that in great detail.

Then finally, I think, just joined up. I operate on a very regular basis between all sorts of elements. I applaud the GIB, they do a fantastic job with a very small amount of capital. I think they do it in a very sensible and practical way. They need more resource, they need more support and we need to use them and various other institutions to try and create more consistency and joined-up nature in the policy implementation. I think the Green Deal needs to be resolved. The Government infrastructure, the £40 billion guarantee programme is a phenomenal opportunity. It just needs to get implemented quicker and in line with the policies of the Government. I think again they are doing a fabulous job, but they need more help getting actual money out the door, or getting projects up and running. Alongside that is making sure that people—the external investors, not just the equity and the debt investors, but people like EIB—feel confident and strong in their design. These guys want to invest in the UK, it is a very attractive proposition, but they are constantly frustrated about the lack of consistency of implementation. I could go on but I think, in the interests of time, that is probably enough. I hope that starts an interesting debate.

Chair: Thank you very much indeed. So many issues, and to deal with them all at once at the same time in a cross-cutting way, so thank you for that. Our final panellist is Robert Rabinowitz, who is also going to be speaking on the whole issue relating to community energy projects from Pure/Leapfrog.

12. **Robert Rabinowitz**: Good morning. Thanks for the invitation to come here to talk a little bit about how we can encourage investment into community energy. My name is Robert Rabinowitz. I run a small charity called Pure/Leapfrog. We are a merger of two existing charities called Pure and Leapfrog, not surprisingly. As you can tell, we have not really thought of a new name yet. However, what we do is we specialise in supporting community energy projects. We have a track record of supporting around 100 projects. We do this in two ways. The first is through pro bono support. So we work with small-scale projects, and thinking about Shaun's levels of ticket size, we are not as his level, we are probably not as his friend level, we are the level below those. So we are taking really rather small projects that can't afford the transaction costs of getting up and running. We have a network of lawyers, accountants, financial planners, technical consultants who donate their time into these projects to get them to investment close, investment readiness. We then provide affordable debt to them to get them up and running.

I think our role here today is to take a bit of a focus on the smallest level and a sector that is still a bit player, which is community energy, and talk about why we should be investing in it more. Community energy is tiny in this country. It represents 1% of the assets by capacity registered under the feed-in tariff. I am going to talk a little bit about why it should be supported more strongly and I am going to just come up with a couple of recommendations as to how we do it. To talk about the benefits, we talked about the double bottom line and the triple bottom line. That is the one we operate with, the triple bottom line. We have a loan fund for community energy projects. We provide cheap debt to these projects in deprived areas of the country. For every pound that we lend out, we get that pound back. Our average yield on the portfolio at the moment is 4.2%. For every pound we lend out, we get about 16.2 kilograms of CO_2 reductions, quite expensive in terms of pounds per tonne, but still a respectable return. Although, I think most strikingly, what we also achieve is we leave £4.50 of benefit in deprived communities. So we get the financial return, we get the environmental return and once you deduct financing costs, operating costs and all the rest of it, you are leaving £4.50 in the local community. The projects that we fund are using that to fund reduced fuel poverty, they are using it to run employment training. We have one organisation that specialises in employment training in deprived areas. We are helping reduce their fuel bill, get access to feed-in tariffs, their plan on that interim employment training. There is a project we will be lending to this week where we are helping a leisure centre that is threatened with closure, because of local authority cuts, stay open. The biomass boiler is the difference between staying open and closing, so we are keeping a swimming pool for seven schools, we are protecting jobs. So the triple bottom line is what we are doing.

However, we are currently doing it on a really tiny scale. We have to scale up. We are currently 1%. In Germany, renewable energy, 50% of it is either owned directly by individuals or through communities. That is where we should be aiming, because the economic multiplier benefit would be significant. So I have a couple of suggestions. What we need in our sector right now is a little bit more than simply a balance sheet to underpin us or risk guarantees for investors, although that is part of it, but we also need some help in getting us up to our initial ticket level, where we can begin to walk into the Green Investment Bank.

The first thing we do need is some balance sheet support. There are risks in these projects that do not exceed the risk of any other type of renewable energy project, it is just because it is a community energy project conventional funders look at it and they do not understand it. I will give you an example. The entities that we fund might not have a significant balance sheet, they might not have trading history. However, what we feel is that from a credit perspective, they are particularly strong, because they are rooted in their communities. We believe we can demonstrate that, but it is going to take us time, so we do not believe the risks are greater. We just don't believe that the funders understand the risks, and whenever we sat down, particularly with banks, to talk about it, they just couldn't get their heads around we were asking them to think about something differently. So we need some balance sheet support. We are not asking the taxpayer to underwrite unreasonable levels of risk. We are asking the taxpayer to help us educate on the risk by demonstrating a track record.

I would say the second thing we need is some more revenue funding, frankly. The organisations working in this space don't have working capital. There are a whole bunch of challenges we face: our origination costs for projects are too high; our transaction costs are still too high. We are developing solutions to address that. Pure and Leapfrog together are creating standardised funding packages to put solar panels and LEDs into schools. We will be creating local co-operatives to invest in those projects, in which parents and communities can invest. We will be providing the debt, we are providing all of the legal documents needed to do the transaction; we are providing the finance on standardised terms; we are providing the pro bono support to get the projects to financial close. So we can get the projects over the line. However, that is just one part of the whole range of solutions we need to address risk management, to address reduction of transaction costs, and frankly, the organisations in this space don't have the working capital. We do need that support to help us reach that level.

Finally, just to come back to consistency, I am not going to repeat what everybody said about consistency of policy. I just want to highlight that for community energy, you have a lot of people who are investing a lot of time on a voluntary basis for the common good and a lack of consistency hits them even harder, because what we have with a couple of issues around state aid at the minute, we have people who have given two or three years of their lives to make projects happen. They have ticked all the boxes, and because of a failure of Government to communicate a change in rules, are finding those are stranded assets that are now not economically viable. So it is an added layer of an inconsistency. I believe very strongly that the returns are there financially, economically and environmentally. I do not believe it would take us much to demonstrate proof of concept, and if we can do that, what we do is unlock the scale of investment capital so that we are no longer a little bit player in this discussion.

13. **Chair:** Thank you, Robert, and thank you for bringing this whole debate back to Earth, at that subterranean level, if you like, and obviously the grassroots is really important. I will open this up to questions. We aim to finish at 10.20am and I don't know if any of my colleagues first of all want to chip in. Yes, Peter Aldous.

Peter Aldous: Yes, thank you Chair. There was very much a consistent message coming out there for the need for consistence in policy terms. I would just be interested, Richard Burrell was fairly damning about the UK, but I think he also included other European countries in that. Where is the role model country or place we should be following and how is the States viewed in regards of shale gas and their energy policy?

Dr Whitehead: I wonder if I could get your thoughts on one of the issues of community energy, which is the dissonance in terms of lending, so, for example, if you are trying to get a district heating scheme going, there is a view by lenders that, “Well, unless you have all your fuel supply contracts, your heating network contracts, your other long-term arrangements all aligned in terms of length of lending, no one will be lending anything”. Now, do you think those are insuperable barriers to that sort of community initiative or are there ways forward as far as getting that financing in line with the realities of what is proposed, particularly the length of return these schemes seem to involve?

Caroline Lucas: Following on on the community energy, if we had time to get to it in the debate yesterday on the Energy Bill, there were a number of amendments around community energy that were trying to both put a target in the Bill for community energy and also increase the threshold for the FiT and I just wonder what your optimum figure would be if you were looking at a figure for the number of megawatts, whether it is, you know, the Government at the moment has a 5 MW threshold for the definition of community energy; others wanted higher figures. I wondered what your position was on the figures.

Just to say to Richard, what you were saying about DNOs was music to my ears, because it feels to me like they are the kind of forgotten players in all of this, and there is a huge scope, I think, if we made them a little bit more visible and were able to regulate them a little bit more effectively, and I wondered if you thought that local authorities had a particular ability and particular responsibility, I suppose, to be trying to put some local regulations in terms of getting more of their local community energy on to the grid and requiring DNOs to do more in that respect.

Mr Spencer: A direct question to Richard really as to what the motivation of his clients is: is it to go green; is it to make money or is it to secure their supply?

Chair: All right. I think I am going to give Robert the first bite of the cherry on those questions.

Robert Rabinowitz: I am going to address the easiest question first around community energy threshold. Sitting here, I am not sure why we have to specify a threshold. I think the definition of community energy is around how it is owned and who benefits from it, and that is the key factor rather than saying it has to be small. I think that is what distinguishes the projects that we are working on. We are fighting at the minute with a load of local authorities to let co-operatives invest with schools, because the local authorities are nervous about PFI and private equity because they feel like what we are trying to do, they perceive us as trying to take the value out of the schools, whereas we are trying to provide a type of finance that satisfies the investors but maximises the value that stays with the schools. I think that is the ethos and it is not about a threshold.

In terms of lending, in terms of contract, there clearly are different types of projects that are more complicated than others, so it is not simply district heating, we have some community energy groups trying to do anaerobic digestion, and again, you have to have your waste supply agreements. There are a whole bunch of things you have to line up that are more complicated. Ultimately, I think there are two responses. One is as an organisation to date, we are focusing on easier stuff, so it is solar. We are focusing primarily on buildings. We are probably then going to get wind and hydro, which are longer, have more risk. You might regard that as a bit of a cop out, but we are biting off one thing at a time. Although again, a lot of that is to do with balance sheet capacity, because the lenders will pay as much attention as they need to that when they feel very uncertain about what balance sheet is backing up the investment and the capability of the organisation to line up those contracts. Ultimately that will just be a matter of time and growth. I do not think you can substitute for that. There can be some form of balance sheet support, but I just think there is an inherent complexity. Maybe

I do not have the answer yet, but there is some need to find a way of putting a bit of balance sheet behind some of those projects that will give the lenders the comfort they need while the other stuff gets lined up.

Chair: Thank you, Robert. Richard.

Richard Burrell: Okay, I am going to just deal with the question in reverse order. Firstly, motivation of clients. When I got into this game, I thought it was about companies wanting renewable energy for all the good reasons that came out of the previous panel, and Google is a good example in this morning's *FT.* However, at a local level, the green energy agenda is one thing, but energy security is the main driver. If you are running a factory in the south-west or a factory in one of the communities, energy security and distrust of the grid and what will go into the grid is what is driving it, and cost, yes, they would like to see a cost reduction, but cost comes third to those.

Caroline, in terms of your question on DNOs and local authorities, we would love the local authorities to be more efficient and to help speed up that process. We are just putting a biomass boiler into a school. It has taken over a year for the local authority to get its act together around the legal process, so I would absolutely love them to do it, but the education involved to speed it up I think needs a bit of top-down push here on the network operators, rather than it coming from the local authorities.

To answer your question, it is absolutely the reason why at Aggregated Micro Power we have funded this business totally with equity. Bank debt at a small-scale level is simply not there, so the only thing you have to do with small schemes is equity finance them, aggregate them together and then go to the debt markets. This is my point about small-scale doctors' surgery developments, they could not get bank debt in the early days and it needs to be aggregated into a pool before the likes of Mike and his colleagues will go and sell the debt to long-term buyers of income.

Mike Turnbull: We love aggregated debt because of the diversification in the portfolios and the assets are much, much more attractive to us, and the bigger the better, because then you get to the liquidity of the insurance and pension funds. The only comment I would make is that we then run into all sorts of European legislation around state aid and aggregated are not allowed; for some reason aggregated are a bad thing to the European community with regard to the provision of guarantees and supports. We have been trying to get an aggregator together for the various elements of the Green Deal, which has been extremely difficult, and it comes back to the point where a very good idea gets challenged by other entities that are not directly responsible for the solution. Aggregation would be a fantastic development, because you would drop the cost of debt from 5% or 6% to 2% or 3% almost overnight.

Richard Burrell: Finally, your question, I am not critical about the UK policy. In fact, I speak to most investors who have been bitten by what has happened in Spain and things like that and nobody I talk to is concerned that the British Government will retroactively take away subsidies. People do applaud the Green Investment Bank. I just want it to do more and when I hear about RBS splitting from a good bank to a bad bank, why doesn't the Government put the money that they are supporting what I would call the retail banks into genuinely bank lending in this sector, because that is what will drive renewables and drive it further. My other comments on the environment agencies are just basic whinges from people at the coalface.

14. **Chair:** All right, do I have any more questions from the floor? Yes, thank you.

Bryan Kilkelly*:* Bryan Kilkelly from World Cities Network. We are working with cities across the world on building capacity between public and private collaboration. It strikes me that there is this theme of the fact that the world is becoming more volatile, and they were talking about the need for consistency, and it seems that part of the answer is certainly building capacity at the local government level. Somebody talked about, I think it was Richard, the biomass plant taking a year for the public authority to get their head around that. We certainly find that one of the biggest challenges to making things move forward is the lack of capacity at the local government level to push forward solutions. So there is a will there and there is a desire there, but if we are really going to get things moving faster in terms of infrastructure investment, in terms of working between developers, investors and public authorities, we need to help the public authorities to have the skills to be able to take things forward. The trend seems to me is that the world is getting more volatile, yet the resources and the people and the skills at the local level to take decisions is becoming more constrained and that is something that we need desperately to try and reverse.

Simon Barnes*:* Good morning, Simon Barnes from the High Speed Sustainable Manufacturing Institute. I have heard an awful lot of the words "risk" and "uncertainty" this morning and it seems to be a major barrier to green investment. Do we know much about—and this is for Mike, really—future demand and where that demand for energy is going to come from, which particular sector and in what form? Is that creating risk and uncertainty in itself, and is there anything that the Government could do to create better demand forecasting potentially around future types of demand to get rid of some of this risk and uncertainty that we seem to be coming up against?

Kirsty Hamilton*:* Thanks very much. Kirsty Hamilton from the Low Carbon Finance Group. We are a group of senior energy financiers with a strong interest in renewables, and a couple of years ago when it started out—Shaun was involved at the helm of that before he moved to the GIB—we had a big meeting all about the investment gap and big picture issues about infrastructure and investment and the £100 billion, and now we are working on the absolute undercarriage issues of EMR, which may not be a surprise to people like yourselves on the panel. However, I just wondered, from the perspective of the Audit Committee's work, how do we join the dots between the high-resolution detail that structures risk in risk management at your level with the £100 billion and the bigger picture issues of infrastructure investment? How do we manage expectations about the timeframe and at some points in time holding the nerve until track record and people have time to get off the ground rather than stepping back again under pressure from austerity and cost arguments? I wonder if you could put a bit of flavour on that. Thank you.

Chair: Are there any more contributions or questions, because I am very conscious that we need to bring it to an end at 10.20am. Yes.

Gavin Dunn*:* Good morning, Gavin Dunn, Environmental Markets at BRE. My question is primarily at Mike, but I am quite happy for anyone else to respond as well. You mentioned briefly green infrastructure. I am very curious as to how you go about identifying from an investment point of view what is green infrastructure, what is good green infrastructure and what is brown infrastructure, and in particular, is there any information that the market or investors require, are there any gaps in that information and the consistency and so on? Thank you.

Chair: I am going to give the panellists an opportunity to respond to the points made that affect them, so first of all, if I may, Mike.

Mike Turnbull: Yes. I mean, on what is green infrastructure, that is still being determined and I would say each portfolio manager has his own view of it. There is definitely information lacking, particularly around the greenness of infrastructure. We are working on that. Disclosure is one of those things, until it starts getting standardised, it is very difficult to get it implemented, but definitely stuff like offshore wind clearly falls into it, onshore wind clearly falls into it. CCS and biofuels and retreading existing carbon plants into more attractive carbon plants is in the grey area between brown and green, and how that works and the efficiency in the carbon reduction statistics are the sorts of numbers that people are starting to look at. There are only a very small number of investors who are genuinely being driven by greenness. To be absolutely honest, most of them are looking for stability and sustainable returns, but I think obviously we will take a lead from what the Green Investment Bank thinks is green a lot of the time. To some extent in my book, it is very important that we get as much capital allocated to as broad a range of green investments as possible at the time. I am not trying to be particularly prescriptive.

Richard Burrell: I want to answer that question on green infrastructure from a different angle, and hopefully answer some of the other points that were made. The best example, I think, of green infrastructure is if you take Gatwick Airport, we have all flown through Gatwick Airport here. What is it? It is a place where a lot of waste comes in on planes every morning and a lot of fast food waste gets generated in the terminals. At the moment, they pay to take that waste off site, and some of it is probably landfilled. At the same time, both terminals need to be heated or airconditioned and lit virtually 24/7. Green infrastructure to me is turning the waste that is generated that comes into the site from the planes or onsite into energy that can provide the heat and power for those buildings. That is what I mean about green infrastructure, and if you can link that with all these high-level targets and the grassroots, that is about what we are trying to do here, and driving investment into those sort of projects is where we will move this debate forward.

Chair: Thank you. Finally, Robert.

Robert Rabinowitz: Local authorities and capacity, there clearly is an issue around capacity, but I think it is also clearly an issue that the people we deal with in local authorities do not get rewarded for helping us make stuff happen, but will get penalised if they let it happen and then something goes wrong, so I think it is about incentives as well as capacity.

15. **Chair:** All right. At this stage, I am going to bring our proceedings to a close. What I would like to say just finally in conclusion is that I think having an event like this, as it turns out on World Environment Day, is just really important. The fact that we have had so many panellists and so many active members of the audience here means that we are not just having an event, we are providing an opportunity for people to carry on networking among yourselves in terms of how we take forward some of these issues. I think that our Select Committee of the House of Commons, the Environmental Audit Select Committee, does have a real role, and it was really like the penultimate question that we had, it is how you bring together all these different disparate issues in a cross-cutting way. Obviously we are not Government Ministers, but our report that we will be launching will come up with recommendations, will be informed by this debate and Government will have to respond to each of our recommendations that we come up with. So what we are hoping is that in the course of having this seminar today, we are, if you like, taking this active engagement a step further on and bringing the very local and the very community grassroots part of our constituencies to the very highest level of decision-making and infrastructure investment and really involving the City of London with all the expertise that there is here as well to see how, in a way, we can all inform the work that each of us are doing.

I just feel very much that the detailed issues that have been raised, it is not just about capital investment, it is about revenue funding, where is the best practice: is it in Germany, is it elsewhere? How do we cope with the infrastructure investment in the future and align investment to not going beyond 2º centigrade are really important issues. I also feel that one of the things that has come out of this morning is dialogue and better informed understanding of the bigger picture in order that we can then go away and develop what we are each individually doing within our own work programme, if you like, in terms of what needs to be done. I think that the whole issue of education for sustainable development, it is no use having all these wonderful ideas if the local authority committee chairman or whoever it is in charge of private finance initiative, cannot escape from the liabilities of the PFI that would allow some of these issues to take place. So it is about how do we innovate and how do we do that on the basis of dealing with the risks that we face and really being able to manage this whole agenda and be vocal about it as well so that we can, if you like, press and urge those who are at the very top table to really find ways of saying, "Yes, that makes sense and this is how we can take that forward". At the same time, I am sure we will have the Green Investment Bank, won't we, Shaun, moving along and saying, "Yes, we need to be looking at these guys at the local level".

So I would like to thank you for your patience and your time, and particularly thank Fiona and everybody here who made this happen. We are very grateful to you, but we don't intend to finish it here. We will be going back to Westminster now for Prime Minister's Question Time, but we will be pursuing this inquiry. Thank you very much indeed.

Slides (Mark Campanale):

1: Carbon Budgets

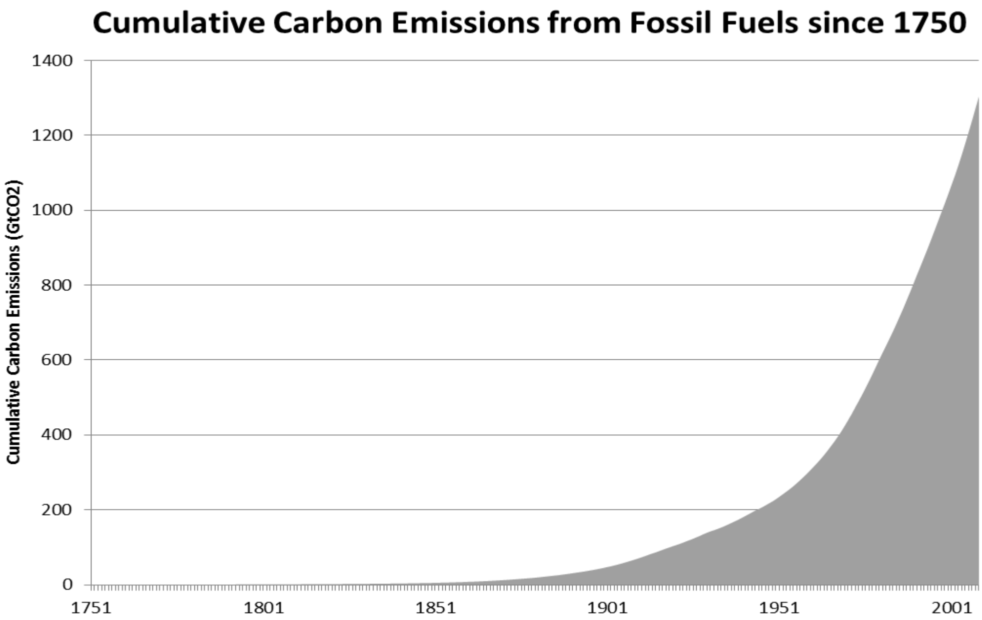
Recognising that **many consider a 2°C goal to be ambitious**, in this work we **stress test the conclusions for a range of goals between 1.5 and 3°C, as well as assumptions about CCS**

Why carbon budgets?

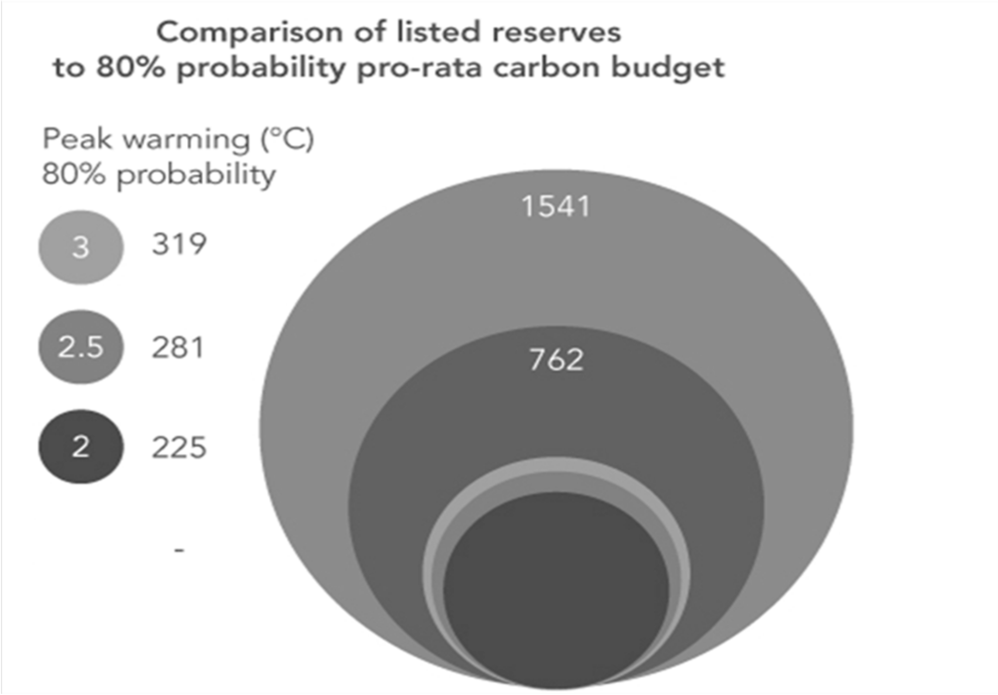
Carbon dioxide remains in the atmosphere for around 200 years.

Cumulative volume of emissions over decades, rather than rate in any particular year that drives climate change.

The budget tells us how much more carbon dioxide can be emitted before a certain target temperature level is exceeded.



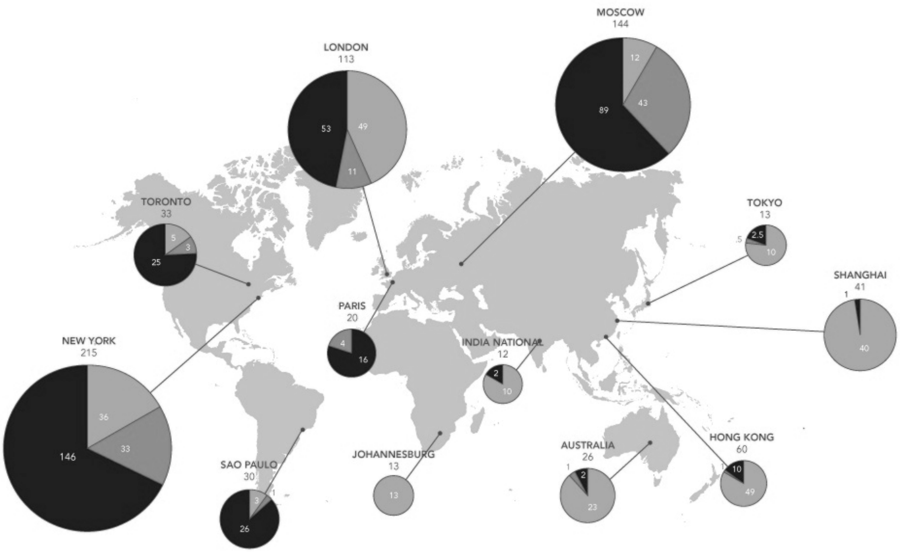
2: Carbon Budget Deficits for Listed Companies



Potential listed reserves: 1541
Current listed reserves: 762

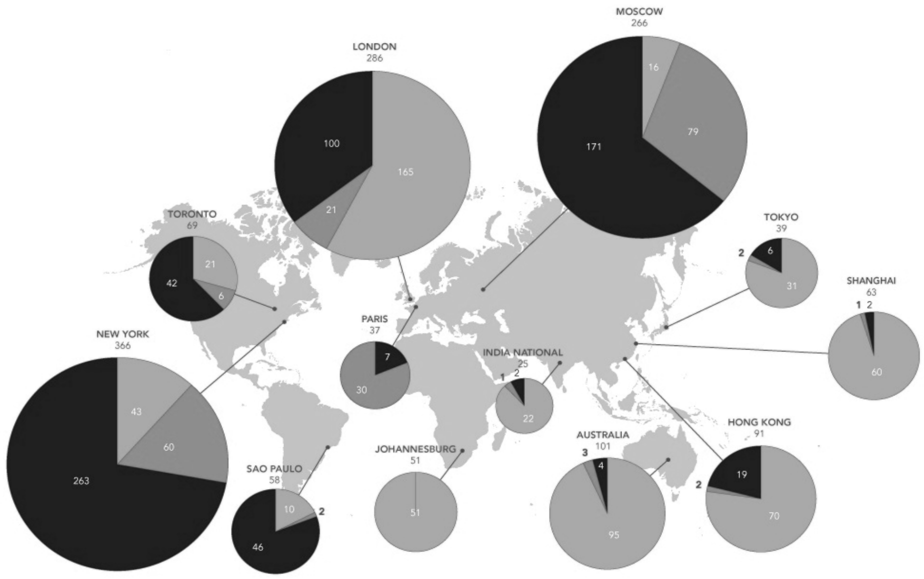
Listed reserves are a quarter of all known fossil fuel reserves.
Current listed reserves (762GtCO_2) far exceed a quarter of the total carbon budgets but could double (1541GtCO_2).
If we break the 2°C budget we very quickly hit 2.5°C and 3°C.

3: Current Reserves on Stock Exchanges



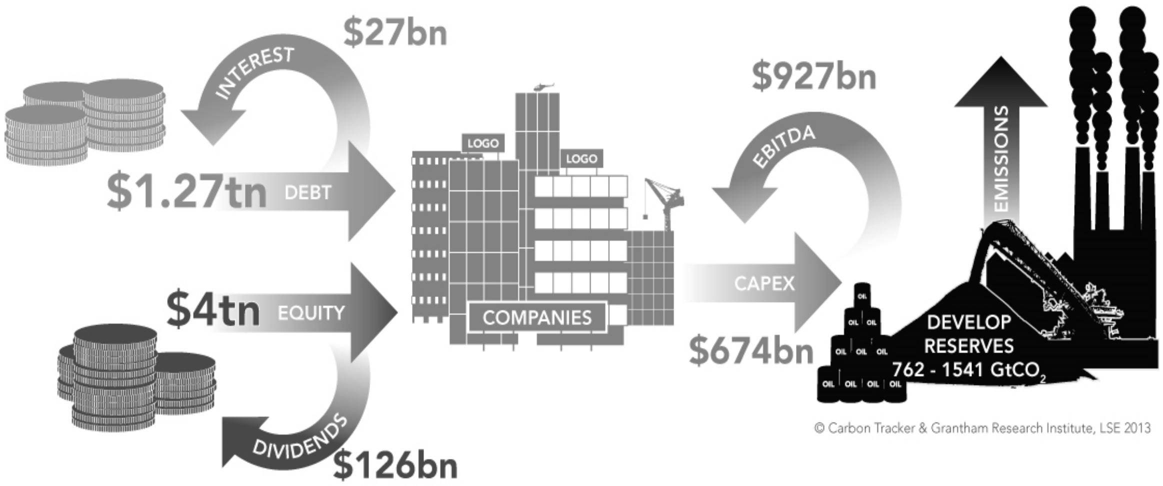
TOTALS
●COAL: 273 GtCO_2
●OIL: 388 GtCO_2
●GAS: 101 GtCO_2
GLOBAL TOTAL: 762 GtCO_2

4: Potential Reserves with ongoing Capex



TOTALS
●COAL: 640 $GtCO_2$
●OIL: 715 $GtCO_2$
●GAS: 186 $GtCO_2$
GLOBAL TOTAL: 1541 $GtCO_2$

5: A Rebalancing is Needed Between Flows



6: Making this Shift – Our Workstreams

Workstream	Systemic Risks	Challenging Valuations	Accounting for Stranded Assets	Capital Raising	Closing the Policy & Market Gap
Activity	Global climate analysis & market rules	New models for equities and credit ratings	Assessing implications for accounting standards	Placing climate at heart of IPO process	Regular updating of macro analysis
Targets	Investors, Regulators	Analysts, Ratings Agencies	Accountants Listing authorities	Banks, Lawyers, Regulators	Investors, Government
Outcome	Regulation of climate change as a systemic risk	New valuations that change CAPEX	Standards which recognise climate risk	Listing rules including climate risk	Climate policy that integrates finance