

**Climatewalk on 29<sup>th</sup> October 2009**  
**Facilitated by Perry Walker, New**  
**Economics Foundation**  
**Hosted by DLA Piper LLP**



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## **Preamble and introductions**

We'll hear what you want to get out of today so that we can tailor what we do to what you want. We'll be hearing from 3 people:

- Shaun Quegan who's going to tell us what climate change is, what causes it and what we can do about it.
- Andy Nolan will talk about what's happening here locally in Sheffield
- Panni is going to talk more metaphysically about the connections between human beings and nature,

We'll then have a chat about the issues raised and you'll be able to ask questions, followed by a break and then Perry will facilitate Climatewalk from 2009 until the end of the century so that we can explore what may happen to the climate. Then there'll be a chance for you in small groups to talk about the things which come up out of the discussion so far and the things you care about and then we'll spend a little time at the end pulling things together, finding out what you made of the event and how to make things better for next time.

Why did you come along today, what would you like to get out of it, what would make it better for you?

- Didn't really know what to expect and it's only with the interest.
- I'm interested in people who are but from a position of fear, threat from a knowledgeable position and I think what's been going on in the last few years creative,
- Is that you want to make sure that we push this out of the way today?
- Just that a person could walk out of here and have a sense of oh I have some knowledge now that I can do an action from rather than enjoy a cup of tea and refreshments but I think that we need something which is a little more of an action.
- If we're not achieving that tell us halfway through
- We can start out just by turning down some of the lights here. That's how simple it can be.
- I was interested to see that the event seem to focus on looking at some of the wider implications of which aren't receiving much attention so far and looking at how people can be encouraged for taking as much responsibility as possible

and in how social structures can contribute to the solution as well.

- Thank you for saying that and I hope the speakers will absorb that.
- I'm from CAFOD (Catholic Agencies for Overseas Development) and having worked for partners I feel very convinced that climate change is happening and is effecting extremely poor communities around the world. Living in Sheffield, I've been used to working with faith communities trying to raise awareness around South Yorkshire about the issues and how our lifestyles are directly contributing. So I'm used to working particularly with faith based organisations and trying to build up knowledge and people having that feeling that actually they can participate and change their lives and actually make a difference. And its interesting to come along today to an event which feels like there's an opportunity to work in a more cohesive, co-ordinated way and I just like to have a feeling of people responsible but also some leadership as well.
- I'm concerned about the response of governments, international, national, local a) with respect to a sense of urgency about the science which I don't think is always there and b) with respect to the amount that they're actually doing which seems to me is falling short of what's required from what I read about things. So I'd be interested in reflections which speakers have on those issues.

That's very helpful so I'd like you all, especially if you've said something to keep us up to the mark when we're half way through and still time to tell us if you're not getting what you need.

- I'd like to hear about what people in groups are doing to try and eliminate carbon emissions and how this might spur on future activity.
- I'd like to know speakers views on I'd like to know what your view is on the state of the planet.
- We're here today to learn a bit about the environment and use what we learn in our architectural studies

## Professor Shaun Quegan, Director, Centre for Terrestrial Carbon Dynamics, The University of Sheffield

What is Climate change, what causes it and what can we do about it? My name is Shaun Quegan and I work at the University of Sheffield, in the applied mathematics department though these days I work far more generally on carbon cycle issues. I run a Centre for Terrestrial Carbon Dynamics and you'll understand why that's important in this context once you've heard my talk. It is distributed across the UK, and works on land, atmospheric and ocean carbon. I will show you a series of slides which aims to tell the climate change story. Although I could talk for an hour on each slide I'll resist the temptation to make a couple of key points.

Fourier became interested in the planet's temperature because he couldn't understand why it wasn't colder; simple physical reasoning suggested that it ought to be around  $-6^{\circ}$  Centigrade. He thought this was connected with the atmosphere, in fact atmospheric carbon dioxide. In 1896, Arrhenius pointed out that  $\text{CO}_2$  would act like a greenhouse layer over the planet, helping to keep it warm. This layer causes the global average temperature of the Earth to be around  $15^{\circ}$  C.

Arrhenius predicted that doubling carbon dioxide would raise the temperature by between  $5-7^{\circ}$  - in his paper he talked about atmospheric  $\text{CO}_2$  causing the atmosphere to behave like a hothouse. This greenhouse effect occurs because radiation coming in from the sun at long wavelengths is partly re-radiated at infrared wavelengths which are absorbed by the atmosphere, heating it. It should be understood this is largely beneficial, since it keeps the planet habitable for us. Without it, it would probably be too cold for life, so the greenhouse effect is partly responsible for us being here.

It was realised in the mid-20<sup>th</sup> century that we were we were putting lots of carbon dioxide into the atmosphere and potentially enhancing the greenhouse effect. Hence, in 1958 David Keeling started to measure atmospheric carbon dioxide at the Mauna Loa observatory in Hawaii, producing over time possibly the most important single environmental science curve of the 20<sup>th</sup> Century.

Keeling showed that the rise in  $\text{CO}_2$  in the atmosphere is growing exponentially; the plot of its mean value is getting steadily steeper. The curve also has an annual oscillation. The growth and oscillation tell us two different things which both indicate the planet is affecting growth in  $\text{CO}_2$  - it isn't just passively sitting there while carbon dioxide increases in the atmosphere:

1. The growth trend tells us we are putting more  $\text{CO}_2$  into the atmosphere and it tends to stay there. Only about half the  $\text{CO}_2$  emitted by fossil fuel burning remains in the atmosphere. The other half is absorbed in the ocean and by land vegetation and soils.

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2. The oscillation shows the effect of the growing season in the northern hemisphere, when plants are actively taking up carbon. A similar curve for the South Pole shows a much smaller oscillation.

Probably the second most important curve of the 20<sup>th</sup> Century in environmental terms is this one. The timescale is from about ½ million years ago; the present is on the right; the CO<sub>2</sub> concentration is the black curve, and the red is the temperature. What you see is the Planet behaving in a remarkable way, with a periodicity of about 120,000 years marking the time between Ice Ages. From the glacial minimum, it warms up rapidly, giving us a comfortable place to live. We are living at the top of one of these bumps, not in an Ice Age. The trigger that brings us out of the Ice Ages is not CO<sub>2</sub> but changes in radiation from the Sun caused by long term cycles in the Earth's orbit around the Sun. CO<sub>2</sub> is very tightly coupled to the planet's temperature for reasons such as greenhouse gas effect.

The other interesting thing about this plot is that CO<sub>2</sub> lies between 180 to 310 parts per million (ppm) and is very closely matched to the temperature, with the same periodicity of 120,000 years. Up to now I've left the last 150 years off the plot; let me show you where we are now. That's where we are now. CO<sub>2</sub> is way outside the normal limits imposed by the planet's functioning. The same physics that predicts the greenhouse effect suggests that, with some caveats, this rise in CO<sub>2</sub> will force the planet to warm, and the evidence is that this is what it's doing.

Where is this carbon dioxide coming from? This pie chart on the right shows why carbon dioxide is going in to the atmosphere; this is mostly related to energy (power), but with substantial contributions from agriculture and deforestation. So the areas we can do something with have got to be production of energy and the way we use land. This shows deforestation is a very significant part of the story because about 20% of the total emissions driving the increase in atmospheric CO<sub>2</sub> are caused by deforestation. This is not just from fire; it's the fact that when you get rid of forest, you trigger a range of processes that can add carbon in the atmosphere. One of these is enhanced emissions from the soils. Another arises if forest is replaced with pasture land for cattle, since their belching emits methane, which is an even more potent greenhouse than CO<sub>2</sub>.

Where does this CO<sub>2</sub> go? I just said it goes to the atmosphere, but it doesn't all stay there. I was recently giving a talk to the Parliamentary Space Committee and a researcher for one of the MPs said, "Well, if you've got CO<sub>2</sub> up there, it's bound to decay away, isn't it, because everything decays". In fact, atmospheric CO<sub>2</sub> doesn't decay. Once you've put it into the atmosphere it would stay there more or less forever, if it wasn't for the Earth's surface sucking it back down by absorbing it into the ocean and land.

Since CO<sub>2</sub> does not decay, the carbon budget is always in balance, i.e. the difference between what is emitted by burning fossil fuels and deforestation and what remains in the atmosphere has to be taken up by the land and ocean. Computer calculations of how the land component of this balance may behave from 1850 to 2100 show that up to about 2050 you get progressively more take-up of carbon by vegetation and soils, but then vegetation's ability to soak up carbon saturates and, much worse, soil stops soaking up carbon and starts to emit it. This is because of increased activity (and hence respiration of CO<sub>2</sub>) by soil organisms as it gets warmer. If these calculations are correct, this will lead to accelerated greenhouse warming. This is an example of a feedback between climate warming and the processes driving climate warming. In this case it's a positive feedback: warming climate enhances the driver, which warms climate further, enhancing the driver further, and so on.

The land surface acts in ways which can both increase CO<sub>2</sub> warming or decrease it. Without going into details, this table lists some of these processes; those marked in yellow are ones in which we have a say as to whether they happen, but the white ones are beyond our direct control.

Reduction in climate warming is unlikely to be achieved by a single fix. Instead we need to respond using many combined points of attack, in what has been called the "climate stabilisation wedge". It's not a case of one solution; it's a solution with many parts; some of them involve how we manage your energy, some how we deal with forests and soils. We have to combine a whole range of creative approaches. What we are all involved in is a one-time experiment with the climate. The factors which are pushing it out of kilter, such as economic growth, use of resources and increase in population, are strongly inter-related,. The challenge is to find new ways to manage the planet within the constraints arising from these factors, unless we want this century to see radical changes to the Earth and its inhabitants.

## Andy Nolan, Director of Sustainability, Sheffield City Council

I'm going to explain at least some of what's happening in Sheffield with regards to tackling the carbon footprint and climate change agenda. I can't promise to tackle every single aspect of this. One of my challenges as the Council's former Chief Executive, Sir Bob Kerslake said about a month or so before he left, "we never had a problem with climate change until you arrived".

Behind that comment I think there wasn't any recognition of climate change as a local issue in 2005 which is when I started at the Council. Over the intervening 4-5 years for a whole load of reasons, climate change is a much higher profile agenda for us locally, regionally and nationally.

I would suggest that the presence of Al Gore in Sheffield in early 2007 made a major difference to Sheffield's awareness of climate change. I'm using this slide this afternoon because it was a partnership programme with DLA Piper LLP where we are today, the Council and other partners to bring Al Gore to the City as part of a very high profile lecture to c. 1000 people at the University of Sheffield.

It's fair to say there was still cynicism and scepticism of climate change and its impact. In 2005 people were still debating whether climate change was happening; those that believed it were still questioning why it was happening.

Al Gore came to the City in early 2007; a lot of people had conversed with him and then saw - the Sheffield Floods - which I remember well because it was my first day back after 2 weeks paternity leave so I was thinking I would get back to work, put my feet up and fall asleep after two weeks of a new baby. I didn't. We were evacuated from our buildings in Meadowhall and sent home as we were all under water. It was a big wakeup call for the City. I don't think you'll find a climate scientist who will be prepared to say I bet my bottom dollar this event was connected to climate change. I don't think you'll ever find that but all of the predictions which Shaun talked about suggest this is going to become a more common event.

Climate change is important because it has huge health, economic, liveability, quality of life issues. It's not simply tactical climate change for the sake of it. Last year for the first time, the City Council had a very clear ambition and commitment to promoting sustainable development and reducing carbon footprint in the City which it set out in its Corporate Plan; the first time the Council's Corporate Plan has made a very clear commitment towards this. It had been in the system's strategy for a little while but the Council showing real leadership has been the first time.

Since then a whole load of things have happened which you may or may not be aware of; the government now requires us to measure and understand carbon emissions at the local level and report on progress against those. These are the latest figures with scrutiny reports - but we can talk about the total of per capita emissions now across the city, not in absolute 100 % confidence but there's always a degree of error here. It tells us where to focus our effort, where we need to tackle carbon emissions in the City; things which will make the biggest impact and from that pie chart you can see the big chunk on the right, the blue, is emissions from industry and commerce; the red is emissions from domestic activity - people's homes; the 17-18 per cent or so making up the rest is from road transport; that's how Sheffield's contribution is divided up.

For the first time getting data and recognising where the emissions were was an important step forward in understanding where to put our effort and where we can put our effort. The question raised before we kicked off the presentations was around the response of government and I think the UK government has made a big commitment to tackling this agenda. We are the first country to have a climate change act which sets by statute the targets we must hit.

The interesting thing as a local authority officer is that much of that activity and the delivery is on our shoulders. Government was quite quick, perhaps too quick to recognise a lot of the delivery would happen at a local level.

Our challenge is whilst there will be discussions in Copenhagen in December about what we need to do in terms of science and survival of the planet, the reality is what does that mean in places like Sheffield which is one of my challenges. Without boring you with all the details behind it, we have set targets as the City which we will seek to achieve.

The good news is we are some way ahead of these targets. We've seen in the last 3 years 2005 - 7 that we've achieved close to 5% reduction on carbons due to interventions such as national policies, taxation, rising energy costs, general awareness raising and the investment in technology which has helped to reduce emissions and vehicle technology and beginning to see improvements in building stock around the UK as well.

What we did as the Sheffield First Environment Partnership which is part of the local strategic partnership was to try and back cast some of our emissions of the city and forecast where our emissions were going. It gave us a very stark challenge, if I'm honest. What it suggested and you can challenge all this; this is total carbon emissions if you look at it as a footprint so it isn't quite the same dataset which I was showing you earlier.

Putting that to one side for the moment, it suggests that carbon emissions have gone down since 1990 as a consequence of a whole range of technological improvements, behaviour change etc. However, the economic ambitions of the City in terms of growth and if we base that growth on carbon intense growth, more people driving further, more goods and services being moved around, buildings opening for longer and operating for longer, people consuming and trying to moderate and control their climate we will see an increase in carbon emissions.

This green line is the worrying trend which says if we were to achieve all of the growth we had in our economic master plan we would be going in the wrong direction. Conversely this is where we need to be so we started to understand where the gap was and then the magnitude of the challenge.

Our vision was to help, encourage and show leadership on tackling climate change and creating the conditions for that to happen in partnership with others in the city. Our carbon reduction strategy for Sheffield targeted the three key areas: home, businesses and transport which sets out a whole range of interventions to tackle carbon emissions in those areas.

For example, in homes we've got a free insulation programme around the City systematically knock on doors and putting in place quite fundamental stuff around cavity wall insulation, loft insulation and giving people a bit of advice and encouragement on what they can do. It's nowhere near enough, I'll be honest with you. I'm not going to suggest that's enough - it's a start a stepping stone.

With businesses I think we've got a real challenge and I do believe that the national policy drive carbon reduction commitment which kicks in next year will start to see real changes in behaviour and investment.

Transport is clearly a big political football and one which is probably the most difficult to crack. Challenging people's need to drive is going to change and reverse a whole culture which has emerged over the last 50-100 years and the emergence of the private car.

Underpinning all of that is a real need for us to be positive in the way we communicate and engage with people. Of course our ambitions for economic growth don't go away so the real challenge is how to achieve all of that carbon reduction whilst achieving an improved economic growth.

These are the type of activities which are going on: this is the slide which we use to promote our free insulation scheme which is going around the City and again David made the point earlier on about how people go away thinking they can do something, if we make this just doom and gloom we will turn so many people off.



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The initial climate language was very much about if you don't do this then the horsemen will come over the top and it will be apocalyptic. I think we need to be very careful about the language we use if we are going to make serious change and help people make change.

Some very practical things, this is a rather uninspiring and pretty nondescript building is a bio-mass boiler in Burngreave which we use to produce district heating for community in that part of Burngreave. We're seeing the uptake of green roofs around the City both in terms of an opportunity to reduce carbon, but also to reduce the impact of some of the heavy rainfall which we'll most likely see again and we're working with the Universities on this. I'm speaking in the building in the bottom right tomorrow evening (Friday 30<sup>th</sup> October) - talking about peak oil.

There are other things going on. This is the energy from waste partners in the City which turns your domestic waste in Sheffield, the black bin waste in to heat and energy which is used to heat 140 buildings and cool one, or will cool one soon the Crucible Theatre refurb is going to be cooled by this district heating network. That's got 60 Megawatts of thermal energy and 19 megawatts of classical electrical energy and the very best in terms of performance of what's happening in Europe. The EON flag is there because we are in the process of working with E.ON on 25 Megawatt Biomass boiler plant in Blackburn Meadows near the M1.

Our waste strategy - I won't dwell on this too much but am happy to take questions on it - we've taken a life cycle analysis approach to understanding how we can reduce carbon in the waste services that we provide residents in the City and we have been recognised as a beacon of authority which is a bit of a flag for the City Council in the work we've done around air quality and improvement in vehicle technology and we are involved in a demonstration project around gas and electric vehicles and you will see more on that.

We're also working with CABI on a manual for sustainable cities and looking at this in the entire realm if you like and understand what interventions we can make and what needs to promote carbon reduction and liveability. And that's all I wanted to say. There is a lot going on and in 12 minutes it's almost impossible to get that across to you but I'm here all afternoon so I'm more than happy to talk to you individually or indeed give you my card and you can get in touch with me after the event.

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## Panni Poh Yoke Loh, International Artist, Photographer & Environmentalist

Panni uses paint, photography and live art installations to work with people to portray responses to environmental issues with gestures and colours to her express her perception of higher consciousness.

A photograph shot at Annurpurna base camp 4000 metres above sea level, a strenuous walk up 3000 stone steps gave Panni time to realise the small part she played in life's scheme. Porters carried increasingly scarce food supplies. They had no chickens, eggs or vegetables. Unlike the UK summer with many birds and trees, there were no trees. We were forbidden to burn transported wood for heat. I realised my dependence on other life forms, my weakness as my body slowed down by lack of oxygen. I watched, listened, sensed, heard the glacier cracking in the eerie stillness.

Physicist Fritoj Capra links spiritual awareness and belonging to the cosmos "it becomes clear that ecological awareness is spiritual in its deepest sense.", (1997). Inspired to question how to improve life and environment, Panni realised we need to focus on how to *Act locally, think globally*.

Panni's challenge as an artist is Susan Lacy says: *'To search for the good and make it matter. This is the real challenge for the artist not simply to transform ideas or revelations into matter, but to make those revelations actually matter.'*

Live art practice which Panni defines as the life of a work of art from inception, public exhibition and legacy through spontaneous interaction of people in our environment. Working with people and the elements, Panni aims to create greater harmony of our interrelationship, some examples being:

- **Abbeyfield Park Multicultural Environmental Festival'** 1999-2004 celebrated its 11<sup>th</sup> anniversary in July 2009 while at *Green City Action* to connect and raise awareness of the green environment in an urban multicultural area with 58% of people from minority ethnic backgrounds for which the Office of the Deputy Prime Minister awarded 'Community Cohesion' award for in 2004.
- **Peace Servings' 2002-3**  
Small scale live art practice with 20 people of different ethnic, cultural and faith backgrounds invited to serve vegetarian food on Ellesmere Green act of solidarity to demonstrate communication between diverse people publicly seen in an outdoor green space.

### SLIDE 11-'Tea Talks' 2006- Fukuoka Asian art Triennale

A ceremonial tree planting by school children give compost to the tree of the tea leaves of all the tea talks orchestrated between very different pairs of people.

**SLIDE 12- WALLACE HEIM quote**

‘They initiate rehearsals of a culture in which those public conversations are possible, within situations imbued with the aesthetic, and which have purposes, however indirectly drawn, to bring about a change.’ (Wallace Heim, 2003)  
Art is about transformation to initiate change.

**SLIDE 13- WRITING THE WORD EARTH**

An outward expression of her last live art exhibition contemplated her place on the earth.

**SLIDE 14- 15-16-17- East-West, Spirit, Earth’ 2007**

Panni’s last live art exhibition ‘East-West, Spirit Earth’, includes garden installations, theatre performance, duet conversation tables and round table on ‘The importance of human relations in the face of climate change’.

‘Unifying Threads’ 2009 with filmmaker Jeni Vine, long term residents and refugees in Barnsley led to considering global migration and how women adapted. This made me consider how those of us who consider we are safe and secure in our present living accommodation and cities, would cope if we became climate change migrants.

Physicist Fritjof Capra in 1997“ The more we study the major problems of our time, the more we come to realize that they cannot be understood in isolation. They are systemic problems, which means that they are interconnected and interdependent.” (Capra, 1997, p.3)

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## Question & Answer Panel

Perry asked for short questions or comments for the speakers' responses.

1. What is the temperature at which soil starts emitting carbon
2. Why has it become so difficult for the transportation issue because integrated transport moving corporate transportation isn't happening enough across the whole country and it's why the government is finding it so so difficult -
3. Question to Professor Quegan in relation to carbon capture - it's a technology that we don't know about and so I'm not so clear why that should be put in to a solution as yet because it's a non-intensive way of going about this.
4. I'd like to ask Andy Nolan about this very worrying steep curve showing a continued dependence on economic growth when we should - economic growth does not lead to increased happiness and benefits.
5. What's your views on the idea of maximum speed of 20mph in inner cities in relation to transport issues?
6. Another question for Andy actually and it's about the role arts and communications industry in campaigning climate changes if an approach based on a stronger message more merely passed a propaganda really used might be a better approach rather than a softly softly approach
7. I was just going to ask you how closely you work with the equivalent of the DTI to look for a model of economic growth which will keep us going but will reduce that polarised model which you (andy) mentioned in your talk.

**Perry:** Couple of points for you Shaun

**Shaun:** This question is about at what temperature does soil emit carbon. In fact, soil emits carbon all the time. As part of their growth, plants take up huge amounts of carbon dioxide, large parts of which enter the soil as litter; soils then emit about half of the total carbon taken up by plants back to the atmosphere, due to the action of microbes and bacteria. These work harder and emit more carbon as soil gets warmer; so as the temperature rises the warming effect accelerates. This exponential response of soil emissions to temperature is a part of the natural world and is not something we can directly control.

**Perry:** There was a point about carbon capture

**Shaun:** Carbon capture as a technology does work, an example being Statoil in Norway. Because of the taxes on carbon emission in Norway, they use carbon capture and win twice over because they pay lower taxes and use CO<sub>2</sub> pumped into their reservoirs to recover more oil, so this technology can work in the right circumstances. Although carbon capture can be applied over a very wide range of scenarios it cannot be applied generally, e.g. to a Chinese coal-fired coal station. Applying it needs an integrated system to generate energy, in which the right geology exists, preferably near the power plant, to allow the CO<sub>2</sub> produced in energy generation to be immediately and safely stored underground.

**Perry:** Andy I've got four for you

**Andy:** I made it six so I'll try to wrap up transport, integration, economic growth and 20mph speed zones in one response. I think the single biggest challenge is for local democracy to understand the choices and give confidence to those representing them democratically that the choices being made are right. I say that not because there are technical challenges.

David's question on transport and integration is not about this school financial or economic challenges, it's about a political willingness to change a culture, possibly restrict choice but certainly be pro-choice on measures and modes of transport which are least harmful. This goes back to the polluter pays principle which seems to have been lost in politics over the last few years and returned in the Climate Change Act - may make the transport sector and choices at the sharp end such as the 20mph zone issue.

When I came in to the council I found a whole new arena for local authorities dealing with challenges on this scale. We need evidence which we need to present; the solution whether we go for 20mph zones in residential areas and set speed limits less than 70mph on motorways is less about whether it's right for one agenda.

The issue is whether it actually meets other agendas as well. I know restricting road speeds on motorways will improve air quality, reduce noise, reduce the likelihood of accidents and probably tackle congestion. But you've got to give the politicians the armoury to say we're going to make a decision which might be unpopular to a loud minority.

Economic growth is a good point; I wasn't saying that we're aiming for unbridled economic growth, but looking at success I would say that with brackets round it that the successful cities have seen significant huge urbanisation, regeneration, investment in concrete, cement, tarmac, metal, wood.

A few weeks ago I saw a programme on BBC2 about the ancient Egyptians and the trade routes through the East. Even in ancient Egypt, the Pharaohs deployed the entire population to build huge temples or pyramids and shows a dependency to build stuff which is what we do.

Somewhere we need to change, disconnect from that challenging longer term agenda. Our challenge is to find a model which I don't think yet exists of a city or place where we've cracked in terms of quality of life sustained over a long period of time.

Picking up on a point about cultures and government, we work far more closely with government on this agenda than ever before. We work very closely with DEFRA, Department for Environment, Food & Rural Affairs because of its broad responsibility for the climate change adaptation agenda, flood risk particularly through the Environment Agency and increasingly with the Department for Energy & Climate Change.

The figures and reports from that Department which has recently produced the low carbon transition plan is this Government's first attempt at suggesting ways to develop a low carbon economy. It will require massive infra-structure investment.

My presentation tomorrow night (30<sup>th</sup> October) on Peak Oil suggests that 200 years ago the Victorians had great foresight in building a city in urban areas with the infra-structure to sustain and improve the quality of life; that's crumbling and needs massive massive investment in decentralised and national energy networks: water networks for example. I am the Chair of the City's Climate Change Working Group which is the 8 big cities outside London and we meet regularly.

**Perry:** Panni we've got two points about culture and propaganda - just to remind us of the issues is about connecting us with the environment everywhere, living in a multicultural area, with people who are happy and proud and I just wanted you to expand on the work you've been doing.#

**Panni:** I felt it was very important to setup the multi-cultural festival. Multi-cultural as a term may not used much now but at the time, it was very important because it was about *all* cultures including white which some people didn't always appreciate. The underlying principle is that we all belong to the human race and we all need to work together as a society. When setting up that festival it was extremely important because I was going to other environmental organisations which only certain sectors of society were going ---- and that was the idea of doing that.

**Perry -** the idea of propaganda rather than softly softly approach?

**Panni:** The softly softly approach - please could we have the question again?

**Question:** My point was could we convince enough people to change their behaviour in terms of their lifestyles quickly enough and we need mass propaganda of a very similar style to that seen in the 2<sup>nd</sup> World War in order to get to enough people quickly enough. Would you agree with that?

**Panni:** Certainly we had to set some rules which we need to go about putting in place and there has to be some sanctions because I don't think there's any other way of going about it really. But I was also picking up on the softly softly and I just wanted to say that if it's about that, we have to have balance and just as an example and that it's not just another example it's not ..... these sorts of issues are important and the reason I mentioned meditation and going within is because I believe we all need to do that sometimes as well as going outward. There are important things about doing that and it's very easy; there is this drastic climate change situation and to go ahead saying we must do this, we must do that when sometimes we need to be still inside which gives us the best solution and how we can all work together. There could be - we need to work together to prevent problems.

**Andy:** Just a quick point, propaganda isn't what we need at all. Effective communication in a world of ever more sophisticated communication is absolutely essential. All of the evidence suggests that if you scare people they tend to feel disempowered. If you make the issue so big they cannot do anything about it has the opposite effect to the one you are trying to achieve.

The approach which social marketing brings is something we need to adopt and I completely agree it challenges the time frame which people change their behaviours. Just think about the drink/drive campaigns, seat belt campaigns, smoking campaigns which have taken 20, 30, 40 years to change and embed behaviour. Interestingly enough with the smoking it was probably the ban in public places that made the big --- but it took 40 years for that to become even near politically acceptable and this is the point which someone made about reducing freedoms.

Dog/sheep campaign is another very successful one.

On that last point about propaganda - there was a MORI poll done last year time asking people whether they were concerned about climate change and whether they wanted to change and overwhelmingly 75 % voted for it and that's something that's been done. But I think what's more important to know is that it's still not at all easy to do things with climate change which people really want to do. Faced with hundreds of choices and not very much information is available.

Anyone like to raise some issues which we could do something about?

- One of my big bug bears is that there doesn't appear to be much being done with things like food waste for example I've got vegetables and food waste from food preparation with nowhere to dispose it, I would like gardeners to take my stuff but cant find anyone who'd be willing to take it. In LB Barnet they've got vegetable waste, green waste, paper waste,, plastic waste and ordinary domestic household and don't think we've got that here.
- Major waste when you go to supermarkets and by the end of the day when the sandwiches are outdated it becomes major waste and there's no mechanism for anyone else to use it for regular and there's an extraordinary level of food waste
- Real actual reasons that we're actually in this position in the first place and I'm interested to find out what people's thoughts on that are and beyond that and the role of the media which perhaps goes back to the propaganda question but the effect of the media on our subjectivities which eventually ends up in the kind of work which Panni's doing which I think is really important - this area of subjectivities and our relationships
- It seems sad that Sheffield has problems of transport which it has seeing that about 25 years ago it had a remarkable free bus system and one of the problems now is that people are faced with impossible choices. If you want to take your family in to town it'll cost about a tenner whereas then it was possible to go anywhere in South Yorkshire for 15p. We have these very large structures which we have to pay for as well.

**Perry:** I'd like you to pick up on one point.

**Andy:** Enabling people to be positive and making positive environmental choices is the big challenge; Wendy's point about recycling seems to be the default position for a lot of people as well. My first thing I can do as an individual is recycle more. I didn't really get enough time to speak about it, but some of the things we've done is look at a range of options. Recycling is just one.

We are reducing carbon emissions in the City of Sheffield by about 58,000 tonnes a year by burning our domestic waste rather than sticking it in a hole in the ground and we will be making announcements in the next couple of months about new recycling services which we are introducing.

I am going to make links to Michael's question about the free bus service. It wasn't free; it never was free. It was cheap to the user who got on the bus but it was paid for in a different way and the point which comes out of this, is how much you as individuals are prepared to have the responsibility for bearing that cost.

We could recycle every single material in the city if you are prepared to see your council tax rise which many of you won't. We may also be able to look at internalising different costs for public transport and a whole range of other things. That's the cusp of it. The models of where we are and if we want to fundamentally rip those models up we can; it will just take longer to do that.

**Panni:** My final point was to say let's keep communicating because we are all in this together and events like this is one way we can do it and produce solutions. I think we've got to keep interacting and persevering.

**Perry:** This point about food waste, Caroline and I made our first venture in to freegalism last week raiding Tesco's bins for tomatoes they'd thrown away and very nice they were too.

Let's take a break and start with the Climatewalk in about 15 minutes.