



Environmental responsibility

Debate on climate change

Emma Duncan

Hello, I'm Emma Duncan. To discuss what we should be doing about climate change over the next decade, I'm joined in the studio by Dave Frame, the Deputy Director of the Smith School of Enterprise and the Environment at the University of Oxford; by Tom Burke, who is the founding director of E3G, an Environmental Policy Advisor to Rio Tinto plc and a visiting professor at Imperial and University Colleges, London; and Charlie Kronick, Chief Policy Adviser for Greenpeace.

Dave, can you tell us a bit about the Smith School and what your objectives there are?

Dave Frame

Yeah, we're a new school – we only opened the doors in October last year –but what we're trying to do is mainstream climate and environment issues. So I think there's a bit of a concern that you see sometimes when you look at environmental programmes around the world that they tend to produce quite good, broad students, but ones who end up in a bit of a green ghetto and not necessarily in the mainstream of strategic thinking or policy making. And what we're trying to do is take excellent environmental scholarship and add that to mainstream degrees. So, each of their fellows teaches in a regular department, rather than in a specifically environmental department. And the aims of the institute are to do the excellent environmental scholarship, but also to inform strategic decision making in business and academia. Because I think there's a feeling that there's something of a disconnect sometimes between what goes on in environmental science and strategy.

Emma Duncan

Thanks for that. Tom, tell us a bit about the perspective that you're coming from.

Tom Burke

Well, I work a lot with E3G, which is an organisation I helped to found. And in a way, E3G is exactly the kind of outfit we need to do to solve the problem. Because what our particular role – as, in a sense, an environmental NGO – is to bring together government and business and NGOs, other opinion-formers, to actually shape the outcome. So in a sense our focus is not on changing headlines, not on stirring up trouble, not on deep research into the sort of economics or the science. Very much on how do you bring together all of those actors that have to play a part in solving what, I think people now recognise pretty widely, is one of the most complicated and difficult problems humanity has ever faced. And in particular, I think, one of the things that we've tried very much to do is to get climate change and energy policy – 'cause they really go together, they're two sides of the same coin – is to take them out of the green ghetto. So that they're not seen simply as an environmental issue but they're actually seen as an issue that is about prosperity and security – actually not just to 60 million Britons, but of indeed of six and a half billion people on the planet. So it's to

get an understanding of the scale of response that we need and why that is justified as a scale of response.

Emma Duncan

Charlie, where are you coming from on this issue?

Charlie Kronick

Well, Greenpeace is a pretty well-known brand, I guess, to some people. It's a 30-plus-year-old environment activist movement that was founded on the basis of direct action – which, in contrast to what Tom and David both referred to as their core business, is *not* usually thought to be about deep analysis or, you know, getting outside the green ghetto. We may even have started the green ghetto. I think in the 30 years since that Greenpeace has been going, we cover a rather larger patch than that. Although a big part of what Greenpeace does is still to cause trouble and is still to kind of cause disruption in the best possible sense – at least I hope it's the best possible sense – where continuity in incremental change, although easy on institutions, isn't actually very effective when you're facing something of this scale, the challenge of climate change. But having said that, as well as buying up bits of land and, you know, in critical places for the expansion of, say, the new runway at Heathrow, we're also doing policy work on the role of large-scale renewables or decentralised generation in the energy mix. So we cover an awful lot of bases, not just in the UK but in around 40 countries around the world. So we are a genuinely global outfit.

Emma Duncan

Well, those are three very good, deep, broad perspectives to have with us today. To set the context a bit, over the past decades, climate change has changed dramatically and hasn't changed at all. Changed, in the sense that it's risen up the political agenda radically. So many people at so many levels of society, all around the world, are now aware of this as an issue that we need to deal with, in a way they really weren't 10 years ago. And yet, in policy terms, not as much has happened as we really need it to. So, at the moment in the UK and all around the world, we're struggling with a whole range of issues. Should we be talking about mitigating climate change, or should we be talking about adapting to it, or both, and where does the balance lie? Energy provision: how do we satisfy our energy needs and at the same time avoid serious irreversible climate change? Aviation policy: how do we deal with the rise in air travel? Carbon trading: is that the right way to go or do we need taxes? How do we need to change human behaviour in order to avert serious climate change? And right now, sitting as we are on the day that Barack Obama is being inaugurated as the new President of the United States – the first President of the United States to commit himself seriously to doing something about this – we're at a really exciting moment.

Tom, can you talk to us a bit about what you think needs to be done now and in the next few years?

Tom Burke

I think you're exactly right about the excitement and the optimism that Barack Obama is bringing with him, and that sense that, you know, there are difficult problems but we can actually do something about them. And, of all the problems we have, climate change is the most difficult. People worry quite understandably about the recession but, you know, recessions pass. Climate change is forever. If we destabilise the

climate – as we’re threatening to do, to the point where it actually won’t support the kind of civilisation we enjoy today – we can’t go back and say ‘oops, sorry, that was a mistake, let’s do something else, let’s start again’. There’s no rewind button, as people say, on the climate. Now, what Barack Obama, I think, has really understood is that there is a tremendous linkage between what you’ve got to do for economic recovery and what you need to do for the climate. And it resolves that dilemma you said between economic growth, which needs energy, and the stable climate which needs not to add more carbon. And so he’s leading the charge in taking the world off the dependence on oil. And if the rest of the stimulus packages align with that and pursue that same goal from Europe, from China, from elsewhere in the world, then I think there’s a real prospect that we will start, with Obama, the transition to the low-carbon economy. Which is what we need to do if we want to have prosperity and security, not just for our children but even for ourselves.

Emma Duncan

Dave, it may be today – this very optimistic day – that’s affecting Tom. He’s taking a very hopeful line on this one. Do you see things in the same way that he does?

Dave Frame

Mostly. I think the thing I disagree with at the start of the thing is actually something you said about ‘not much has happened’. I think one of the things that we have to realise is the scale of the problem is enormous. And carbon, the release of fossil carbon, is different from all the other environmental problems we’ve faced before because the range of processes, the number of actors, are so much more vast than in, say, ozone destruction or sulphate aerosols. But I think, given the scale of the problem, we need to work on a whole range of fronts and in a whole range of different ways to come up with sensible solutions. And I think there has been a lot of work on policy thinking. And companies have spent a lot of time thinking about, beginning to engage with the problem. And that’s partly because of the, Tom and I both mentioned the green ghetto, but we should also give credit to the NGO community for having raised the climate change issue up the agenda. And I think that’s forced companies to think about their carbon footprint and to think about what their influence on carbon is. And there is, I think there’s beginning to be, some real movement on those fronts.

And – given that it’s only really, not even 10 years since the third assessment report of the IPCC really showed some smoking-gun evidence for the existence of climate change – I think actually a lot of the global community has moved quite fast to at least engage with the issues. And I think it’s important that we continue to develop thinking and to try and come up with rich perspectives that will enable us to grow sustainably – rather than strike, necessarily, just while the iron’s hot because it’s hot. So I think the thing I’d like to see from Obama is well-thought-through policy. And I think, I’m sure he’ll have the time to do that. But I think developing coherent strategies around the world, and tying in other really important global issues – such as trade and development – into climate policy, is really going to be one of the key challenges that his administration’s going to face and the EU will face in the next 10 years.

Emma Duncan

Charlie, given that we have a relentless drumbeat of bad news from the climate scientists, and that emissions go on going up faster and faster, do you feel as optimistic as these two others do?

Charlie Kronick

I think I look at it slightly differently. I don't think you could be an environmentalist for 20 years and not have some innate sense of optimism, or you wouldn't keep coming to work. But actually, I really do disagree with Dave in that although I think there's been a lot of noise around climate change in the last year, and clearly that climate science has advanced beyond all recognition, actually emissions have continued to rise quite dramatically in the United States, you know, or very, very dramatically in China, which isn't surprising, or countries like India. But worryingly, even a progressive market leader like the UK – which was, you know, for many years considered, at least in rhetorical terms, to be at the forefront of international climate diplomacy – most of the gains were made for a series of one-off or structural adjustments to a couple of industrial strategies or power sectors in the 1990s, and since then every indication has actually gone the *wrong* way. And I would question how serious companies are, at the broadest level, about climate change if you've got companies like RWE or EON – big European utilities – which are not just, you know, inclined to but are actually absolutely intent on building new unabated coal-fired power stations, using technologies that are incrementally better than the boilers, the 1930s, but only just. Leading to what will be absolutely *enormous* increases in carbon emissions from the power sector, combined with, of course, you know, recent decisions around infrastructure, like runway three at Heathrow. So I'm not optimistic at all about what the government or industry has put on the table so far.

I am optimistic about what's *possible* to achieve, but I think even just today amongst the four of us discussing it, there's been the idea that unending economic growth – at least on the scale and in the pattern that we've been experiencing the last 30, 40 years, the post-war boom – has to be an inevitable outcome. And I think there are going to be, and Greenpeace thinks there are going to have to be, some kind of trade-offs, not just in terms of consumption but in distribution of consumption. And if poverty eradication, which Greenpeace takes very seriously in the developing world, is going to happen, it's simultaneously with responding to climate change. There actually are going to have to be some negotiations about who gets what and how much and when. And that has not been a very obvious part of the climate negotiations so far – it's been classic power politics – and in that regard it's been exactly like the trade negotiations in the WTO.

Emma Duncan

Do you mean you're going to have to make rich people poorer if you're going to make poor people richer?

Charlie Kronick

I think that, at the very least, rich people are going to have to contemplate getting richer at a much, much slower rate. And I think that if you, you know, you look at some of the work that people like the New Economics Foundation have done, is you have to find a much better measurement of prosperity than crude GDP. And at the moment that's not currently even part of the conversation.

Emma Duncan

What I would like from you now, if you wouldn't mind, is a fairly clear, brief sense of what in policy terms we need from the Obama administration and then globally in order to tackle this problem seriously.

Tom Burke

The first thing we need is lots of public spending. And we need lots of public spending on the transformational technology change that we need, you're not going to get that from a carbon price. Now, you're not going to get that *without* a carbon price, but carbon prices will produce change at the margin. Because of the nature of this problem, we need transformational change. We need change in a specific time. So you're going to have to spend and be prepared to spend a lot of public money. Now we're going to spend a lot of public money anyway on the recovery packages. So the issue is *what* do you spend that on – not just how much do you spend – but what do you spend it on? And, if we're spending that on energy efficiency, on deploying the renewables and deploying carbon capture and storage, then as I said earlier we're getting onto at least the beginning of a pathway to a low-carbon economy. If we miss this chance, then I think life is going to get very hard indeed.

But even that won't be enough and we really are going to have to use a lot more regulation. We've, I think, had a pretty kind of brutal lesson in the downside of living in a very deregulated world. I think that's just as true for climate change as it is for the economy as a whole. And so there are areas where we really need to do things through regulation much more effectively. You look at the California Climate Action Plan, for instance – which is one of the most advanced and most praised plans – you look at what *actually* they're doing, they're doing an awful lot of work using things like building standards, appliance standards, to drive things forward. Now, I'm very much in the Michael Porter camp of thinking that actually the right kind of regulation, deployed in the right way and at the right time, drives technological advance and brings with it economic productivity gains. So one of the things you've really got to avoid doing is making false choices.

Emma Duncan

And the carbon price that you're talking about? How would you get that carbon price and how would it work?

Tom Burke

If I could trust governments then I would get it by a carbon tax, because it creates a sort of predictability. But I'm not relying on the price signal to bring about the change. I would then do what we've seen has worked, for instance, with the Swedish NOx tax. I would then hypothecate – though dreadful word, that – hypothecate those revenues towards making the technology shifts we need to make. Now the advantage of that is politically it's transparent, you have a self-sunsetting tax. As you drive down your carbon emissions, so you need less and less tax to get the next step, and so the public can see that they're not being, as it were, hijacked by stealth taxes. I think that's pretty important. I think trading in some places will have a part to play, and maybe particularly with the power sector – if we can stop the power sector sort of double-dipping on the revenues on it – but I think trading may have some role to play. But it has very high transactional costs, and the idea that we're going to build a global carbon market any time soon – even with everybody pulling the same way, which they're not – doesn't really take much account of the kind of thing that's taken to build *any* kind of global market. It takes a long time. Time is the one resource we don't have with us, probably.

Emma Duncan

Dave, would you go with that very heavy public spending, heavier regulation than we have at the moment, and a carbon tax?

Dave Frame

Mostly. I'd certainly go with *smart* regulation, which is what I took Tom to be meaning, rather than heavy. And I think there's a hell of a lot of the gains that we're after that are not inspiring and not terribly glamorous – like building insulation, things like that – which could well be a part of those sorts of initiatives. Tax versus trading: I'm a bit of an agnostic on that one because as I understand the economics, it's that it turns on the marginal benefit of abatement of the thing you're trying to get rid of. And that you prefer – in the case of carbon – you would prefer taxes in the short term and trading in the long. And that poses all sorts of challenges. But the four things I think I'd, I think will be needed are big initiatives on carbon accounting, because it becomes very obvious if you try and do carbon, if you try and produce a trading system, that you need good solid carbon accounting. And in fact the initial allocations of the EU emissions trading system showed what happens when you don't. But even if you have a tax, you're going to want to know what you ought to be paying tax on and I don't think at the moment there's any internationally agreed framework that everybody finds compelling. So I think one thing we'll need to get to grips with is finding ways of accounting embedded carbon across a vast range of processes.

And thinking about timescales associated with the climate, we often hear claims that climate is urgent in one sense or another, and there are times when that's probably right and there are times when it's exaggerated. And I think it often depends on the sort of churn timescale of the industry you're talking about and things like coal-fired power plants, which are going to be around for 60 odd years. Obviously if you build one of those today, anywhere in the world, you need to think of the emissions implications under whatever global scheme you're intending to bring in. You need to think about the emission implications in 60 years' time. So quite often, although people have space under some sort of emissions plan they may be advocating today, they run out of room quite rapidly with that. But then there are other sectors like, as I mentioned, building insulation, where you could do things quite fast. So I think timescale, unpacking that and bringing that into the policy arena would be really useful. And doing things efficiently so as to not be more wealth-reducing than they need to be is obviously pretty key, 'cause there's so many other things we want to do.

And, finally, to make equitable policy. It's an easy thing to say and it's a really hard thing to do because it brings to the fore all sorts of issues about the framing of the problem. How broad is climate policy? What other policies does it need to be bundled in with, and what other policies does it leave outside its realm? And I think that's really easy to answer that naively or to answer it badly, and I think that I'd like to see a lot more of the negotiations being around development trade and a variety of other things as well, such as corruption. Because we have this intergovernmental process and where many of the governments aren't necessarily great with public funds, it runs the risk of eroding political will in the developed world, as well as being detrimental to the welfare of the people on whose behalf these transfers are being initiated.

Emma Duncan

Charlie, any other bases that you want to cover on the policy front?

Charlie Kronick

No, I think that, I think Dave and Tom have covered pretty much everything that I would have picked up on. I think there's something, though, that Dave mentioned I think is really interesting, talking about the political process and the negotiations that are ongoing. The Copenhagen deadline of 2009 for negotiating a successor to the Kyoto Protocol means that the ideas will have an ongoing regime, which will begin in 2012 and carry on onwards. But the decisions that are being taken now about new power stations, about new runways, infrastructure, there's kind of a very, very long lifetime and run the risk of being, you know, severely stranded assets in economic terms and real white elephants in environmental terms. Those decisions are being taken almost irrespective of that political, multi-lateral political process, which for all its flaws is very attractive because it's a multi-lateral process. And there is this real tension, I think, between, you know, the sense of urgency which people like, you know, Greenpeace and others constantly go on about and the sense of the ongoing march of progress that, you know, quite reasonably people responsible for the economy have to take responsibility for. And that tension, I don't see it being resolved in any way or even being publicly explored in current decision making. And so it just stays there and the whole circus goes on and on and on, year on year, you know, you get thousands of people walking up to these things. You make this tiny progress in the sort of incremental negotiations. But its *decisions* – that are going to affect those outcomes beyond 2015, 2020 – are rolling onwards with very little input. We really need to find some way, whether it's in policy terms or political terms or even activism terms, to address that tension. Because without it, we'll have an agreement – it might even be a good agreement –but it won't actually do the thing that we need it to do, which is to avert the worst impacts on the climate.

Emma Duncan

Well, that's the crucial thing, isn't it? How do we bring the discussions together with the reality? And that's what I want to bring you on to now. We're at a really interesting time for making global policy, which possibly makes making environmental policy between the rich countries and the developing world harder and possibly it makes it easier.

Tom, can you talk a bit about how do we do 'greenery' in a recession? Can we bring these things together, do they conflict or do they help each other?

Tom Burke

You have to separate the discussion on the politics of this from the discussion on the policy. And one of the reasons for getting out of the green ghetto and indeed the climate ghetto is to get away from endless discussion of the minutiae of the policy, because that isn't how we're going to do it. And you need to remember that international treaties consolidate political bargains that have already been made – they're *outputs* from those bargains, they're not *inputs* to them. And to some extent, we've gone off in the wrong direction on climate change that doesn't mean the negotiations aren't very important; in a sense, 'park those, they'll run their course' in the way Charlie just described.

Emma Duncan

Can I just stop you? Just talk to me a little bit about that very interesting distinction between the politics and the policy.

Tom Burke

Policy is the map of how you get from here to there. Politics is the journey. You use different tools to make a map than you do to make the journey. And quite often in making the journey, you're using the instruments or tools you've got on the other people you want to take along with you. So it's a much more crude and brutal process, which is why I said at the beginning, the key to the politics of this is aligning up the stimulus packages. Because what will actually bring about the technology transformation that we need is not detailed agreements about emissions and sharing of burden and all that stuff, which will go on forever. What will bring it about is the kind of public spending I've talked about on the scale I've talked about, and if that's done – essentially by the EU, by China and by the US – then the rest of the world will follow.

Now that's a political process, it's not a policy process. The countries don't need to agree their precise measures and so on – they don't even need to agree to go together – but they have to agree to point in the same direction and to align the scale of ambition that they've got for that. Now, that's not instead of the negotiations. But if you don't do that then the negotiations get bogged down in the sort of swamp of minutiae, because there isn't enough political space and political momentum to force people to agree. If you start creating the alternative you want to see then people follow that. And that's why I'm optimistic about Obama, just in a resurgence of hope, not because they think our prospects are yet all that much better. But at least, it seems to me, he understands the importance of creating a sort of political impulse on the right scale for this, and he explicitly links what we have to do on economic recovery and what we have to do on energy and climate.

Emma Duncan

OK, I can see that, but isn't this a pretty dreadful time to ask any government to start spending large amounts of new money on anything? And we're pouring vast quantities of taxpayers' money down a black hole called the banking system at the moment. Dave, do you think one can reconcile these two rather difficult aims?

Dave Frame

Well, I think on the policy versus politics side, the thing I worry about there is one of the arguments people deploy for capping trade systems, as opposed to taxes, is you build a constituency around the policy and therefore you have a bunch of people whose vested interests lie in the maintenance of the policy. And the argument against tax is well, they won't be there long, and it's interesting to see EXON come out in favour of tax, presumably on the grounds that everybody likes repealing taxes. But I think there is a danger – and the same danger occurs with creating communities who are recipients of large-scale public funds. And that's if you create political inertia behind a policy process that you haven't thought through properly, that you subsequently decide you really aren't that keen on, it's much harder to unpick. So I think I agree –

Emma Duncan

Do you have any examples of that?

Dave Frame

If you try to unpick something like the European, the Emissions Trading System – I'm not saying it's necessarily a bad policy – but if you wanted to do something like

that it would be pretty hard. A better example is probably the Common Agricultural Policy, actually. Personally, I think it undermines a lot of European claims to moral leadership in the environmental arena. But if you try and unpick something like that, you find that the reasonably small number of people who have a massive vested interest in it end up making sure that they have a very strong vested interest in it. They make sure that the thing continues to exist. So you lose the ability to revise policy if you decouple too much the politics from the policy.

Emma Duncan

And, Tom, could one not also cite the American biofuel subsidy as an example of this? You have huge government spending, gets poured into the pockets of farmers, it gets sold on a green basis, turns out to be a really bad, not at all green, incredibly expensive policy. And does that not end up somewhat discrediting the whole 'tackling climate change' cause?

Tom Burke

Uh, possibly. I mean, you just remember that the corn subsidies for ethanol production were being sold long before people were as anxious as they are now about ethanol, and had lots to do with Tom Dashed getting votes in Dakota. So I think you want to be careful. But there are going to be mistakes. Don't kid yourself that making the kind of transformation we're talking about – we need to do and we need to really get going in the next three or four years – making that kind of transformation is not going to be mistake-free, at all. But partly why I said the way we should do the tax is linking the tax to the emissions, so that as the emissions go down then the tax yield goes down – precisely to get out of the kind of trap that the CAP can produce for you. So there are ways to work your way round that. But right now, I don't think there is a serious political impulse to deal with this problem. I think that what was being said earlier on by Charlie and Dave about the sense of the slowness of the process is right. So sitting around arguing about what's the best way to pay for Spitfires or Hurricanes in September 1938 is, you know, maybe entertaining but it's probably not going to help you very much. And I don't mind if in the process of trying to get the Spitfires and Hurricanes, we build three or four other planes that don't work. Because we're in that kind of state.

Dave Frame

I don't agree that we're in that kind of state. I don't think that the sense of urgency is like that of a war. And I think that the risk of analogy, making an analogy between a war and climate change, is that one, in a war, people are prepared to undergo hardship because they know exactly what it would be like to win, they understand there's a finitude to it, they know what the victory conditions are, they know it's temporary and they can see the end game. And I don't think those things –

Tom Burke

You mean like the war on terror?

Dave Frame

Actually I think a war on carbon would be just a lot like a war on terror, war on drugs.

Charlie Kronick

I think a war metaphor doesn't help us very much here, but a wartime footing might. And I think the idea that the urgency isn't there is – I think it's not, I mean, if you

look at the recent science, I think the science says it all. But I think even if you don't look at it in scientific terms – look at it in infrastructure, investment terms – there is going to be hundreds of millions of Euros spent on electricity power sector, infrastructure, regardless of whether you believe climate change was happening or not. The chance we've got right now, combined with the economic downturn, is that we do that – that infrastructure can be guided, in Tom's terms, in the right direction of travel. Of course there are going to be mistakes in, you know, certain technologies aren't going to deliver as much as they should or the implementation of certain technologies. You only have to look at the growth of wind and then the crash of wind in California in the 70s, and there was one simple reason: it was an investment tax credit not a production tax credit. So you could make money by building wind farms. You didn't have to generate any electricity from them. Simple policy interventions can make actually a big difference, and you can make adjustments to make sure they deliver the right outcomes. But if you go back to corn ethanol, I mean, it was never about climate change. It was always about fuel security in the United States. And I think a lack of honesty –

Tom Burke

It's always about votes.

Charlie Kronick

– votes combined with the rhetoric of independence from Middle East oil. I grew up in the Great Plains and I know about what we used to call 'pork barrel politics', and it's very, very powerful in the United States. But you can turn pork barrel politics into a reasonable outcome if what you're clearly identifying is the right outcome. And I think there is a real, you know, there was – it was just downright dishonesty in the biofuel debacle, I'm afraid.

Emma Duncan

OK. What, Charlie, is your sense of what to me is probably the crucial question over the next couple of years, which is in America, how do the forces for tackling climate change play against the forces resisting the urge to tackle it? And, you know, who are they on both sides and how do you feel that game's going to play out?

Charlie Kronick

Well, it's really interesting and it's incredibly fluid at the moment. You know, one of the most successful oil men in the late twentieth century is a guy called T-Bone Pickins, who is an absolutely compelling and persuasive advocate for a renewable economy. For moving, you know, for moving away from oil for electric-powered vehicles, massive investment in onshore wind, you know, on the Great Plains – the kind of thing that even four or five years ago would have been considered – in a Texas oil man – would have been considered unthinkable. I think bizarrely, wonderfully, ironically, you know, the California Climate Action Plan in Schwarzenegger's leadership has been extraordinary. You know, the combination of output efficiency standards for power stations, low-carbon fuel standards, which means that the oil derived from the Canadian tar sands will never be sold in the lower 48, you know, in the continent of the United States. They are really exciting and quite remarkable transformations in a short period of time. But they've got to deal with the coal states. And so there is this massive counterweight to, you know, the progressive policies in, you know, mountain-top mining and old-fashioned extractive industries. And those tensions are playing out in quite a different way than I would have

expected a couple of years ago, but they're very real. And although there might be differences of opinion around the table for the potential for carbon capture, I think it's a real thing. I just don't think it's going to be a real thing in the timeframe we've got conveniently available to us. So –

Dave Frame

What is that timeframe? Because I think this is another point of disagreement.

Charlie Kronick

Well, it depends on who you ask. I mean, EON were pretty clear that, you know, the big European utilities have been pretty clear they don't see it happening in any kind of industrial scale, utility scale, before mid-2020s, maybe 2030. That's not soon enough, which then brings that conflict between the coal states and California – to put it crudely – in sharp focus.

Emma Duncan

Charlie, Tom, Dave, I think you're all, I'm happy to say, a little more optimistic than I expected. Thanks very much.