Transcript BBB1

Interviewer (Ir): So first of all thanks again for agreeing to take part in the interviews, cos we couldn't do this without your...without you giving up your time, so thanks. Err, yep you signed the consent form, erm...yeah I've explained to you, I'll ask you a few questions about your job role and your company and then we'll move onto talking about policy instruments.

Interviewee (Ie): OK.

Ir: So that's the kind of structure. Erm, ok so first of all if you could just...and some of it will be stuff that we've already be discussed but just so we can get it actually in the interview. So don't worry about repeating things that you've already said to me. Erm, so if you could just briefly describe your job role and what your responsibilities are.

Ie: OK, so my name's [redacted], I'm the engineering director for [redacted]. I've been with [redacted] for just under 3 months. My role mainly is to deal with, if you want, future engineering designs or engineering designs as they stand at the moment on sites. Although I do have a bit of an overlap on operations as well as construction. Because I have experience of both of them. But we do have designated operation and construction designers, erm directors, for that sort of role. Erm, [redacted] itself is more of a co-location, so within the data centre you're in at the moment there is many different clients, people might buy by the rack, or by the room, that's not a problem. They could probably also buy by the whole data centre if they wished, we don't really mind as long as the commercials work.

Ir: Yep.

Ie: Erm, [redacted] I believe have been around probably for around 6 or so years. First data centre in [redacted] coming on line into 2011. Next phase of that was 2013, and then [redacted] which is the latest one was 2014. But we are still, erm, building some parts of that as well, so the full completion of it I think will be May, next year, 2016.

Ir: OK. Erm, so you, you have involvement in sort of M&E and stuff like that?  
Ie: My main bit would be M&E, everything else I would have said is to try and support...

Ir: OK. Do you have much involvement in speaking to customers, winning contracts and stuff like that?

Ie: To, yes, to a point. Certainly at the moment some very large contracts we're working on, yeah I'm...the sales team will sort of speak more directly. But I will be like for instance this afternoon I am on a conference call with one of the clients with the sales team supporting that. So I...they take the lead but we do the support in the...you know that we need to do to help them.

Ir: OK, good. Erm do you, as a company, you probably have different contracts for different customers, but to what extent do you pass on electricity bills to customers?

Ie: I don't know if we're unique in...yes we do, absolutely. All of our, all the electricity basically is billed to the customer. What I was gonna sort of say is I'm not sure if we're kind of a little bit unique in the industry, but we also fix our PUE. So we'll say to a client, for this data centre there is a certain PUE we'll guarantee you. Therefore if we don't hit that PUE we lose. And if we're better than, then obviously...I don't know exactly if we pass on the savings or if we, if that's the kind of deal, you know, it's like that sort of almost double edged sword. That's one part I suppose of the commercials I'm not 100% sure of. But I'm not sure many other people that kind of do that. Erm...and obviously then from the energy efficiency point of view, the finance sort of things, also are interested in our efficiency, so it kind of, I think it kind of brings everybody in. Maybe not necessarily sales, but certainly on the side of operations, finance, the energy efficiency of the data centre, meeting what we say it's gonna do, or better that, is in our, is definitely in our favour.

Ir: OK. That's good. Erm, could you just give me an idea of how big the company is in terms of you know how many data centres, or like total electricity consumption or square footage or...

Ie: OK, Erm yeah. We can probably do that I would think. We've got 2 main data centres at the moment and I think more will come on line in the next couple of years. The 2 data centres between them at the moment are...they probably consume a couple of megawatts. The [redacted] one is still fairly new and a lot of the customers there are still installing a lot of their kit, certainly in one of our sort of biggest customer there who signed for 2.2 megawatts is still installing all their kit. So we would expect that to increase by at least a megawatt over the next year I would think. Most of our clients have some form of ramp up that they discuss with us. The designs of the data centres, the [redacted] data centre has a technical load of about 4.2 megawatts and has incomers up to 8. The [redacted] one...we're still kind of tweaking that a little bit but we could say it's about 11.4 megawatts of technical load. Erm, up to maybe 13, and then the incoming supply to that is 20 megawatts. Space wise, this one's got about 30000 square feet and that one's got about 70000 square feet.

Ir: And, well we kind of discussed this before, but you're kind of in the process of expanding within the existing data centres or...

[brief interuption]

Ie: Yeah, well I'm not in the senior management team, so I don't know exactly where the company's going, but I would consider that that is...I believe that the company has a drive to acquire, because that's one way of growing a bit more rapidly. But the [redacted] data centre, which has been purpose built as a data centre, as opposed to buying a warehouse and fitting it out. And purpose built quite a bit to use adiabatic and evaporative cooling. I feel that that is very well received in the market, and therefore I think that we will probably have 2 sort of channels, one buying, and another one, developing our own. Buying land, owning that land, and then developing data centres that can basically use the latest technology.

Ir: OK. Err, what sort of tier classification do you run to, do you have a...

Ie: Yeah, I mean [redacted] is, for design is tier 3, it's not been certified as billed. The [redacted] data centre has...is classed as a tier 2 data centre, we haven't had it certified. The other thing we're also doing on the certification side, although it's been delayed slightly, is the M&O by the Uptime Institute, I don't know if you know? So the same tier rating can also go into the M&O. So that's all to do with maintaining and operating the data centre. So they will...so the Uptime Institute can accredit it at the design stage, once it's been installed you know, construction...but they also, they also can give a tier rating to how you manage your data centres going forward. So building them is one thing, but if you don't manage it very well, then that can be also a risk. So something we're putting a bit more emphasis on going forward, is probably what's called the M&O from the Uptime Institute. And that still has...in there our ambitions to become tier 3. So we can build a data centre and operate it to that tier 3 standard.

Ir: OK. Good. OK yeah you mentioned that you measure PUE. What sort of PUE do you run to? I guess it may vary across the sites...

Ie: It does vary, this one...I'll say approximately, I believe what we contractually try and say for [redacted] is 1.6, cos there's chilled water system. And for [redacted] we're going for, this is looking at power only, 1.2. And there is a water content to that, but, power-wise as far as I'm aware it's 1.2.

Ir: Yep, OK. Good, right well I think that covers it on the, you know, who you are and what you're doing. So I'm gonna ask you a few questions now then about the code of conduct. So you, [company], aren't participants...

Ie: As far as I'm aware yes. No I don't believe we are.

Ir: OK. What would you say prevents you from thinking about applying for participant status?  
Ie: As a business I'm not really sure...I think that...it may...maybe me thinking as opposed to [company], I would probably say that it's, you know, we have looked at the CCA type of thing as being maybe the bigger driver, than maybe the European Code of Conduct, because it is a code. And I think also that the CCA pretty much...I don't know, I'm not sure if the 2 sort of do the same sort of thing, I'm not sure if you know exactly...from what I've read of the code of conduct, you know, cos you're kind of setting targets and trying to...well the CCA's asking you to do the same thing, so I don't know if there's actually a doubling up there. Erm, and I remember as well that I think they're looking at changing all of this lot, as well, sort of trying to streamline the whole lot, I know it's not necessarily for the European Code of Conduct but I don't know if the whole CCA thing is also looking at being streamlined into something new...so I think that's probably more to do with it. I'd have to probably ask the question of my boss who's sort of the chief technical officer, to sort of say, why haven't we signed up to it? Is there an intention to or...if so why not. I did ask him if he wanted to do this interview instead of me. Because he might have a better idea on some of those items. But I can probably, I can get back to you and find out with that one.

Ir: OK, erm so, am I right in thinking that you might, you're probably not necessarily that aware of the content of the code of conduct in its detail and stuff?

Ie: I certainly have read it. Although I would say at the moment it's probably a bit...because I think we're not signed up to it, it's not completely fresh in my mind. I would have said the last time I probably read it was about 6 months ago. So I can certainly remember...you know, a good deal of it, and that's what I can kind of remember is it's almost like that, you know, evaluation and setting, and sort of, you know trying to achieve those things, and then recording how you, how you achieved or not achieved it. And that sort of continuitive improvement. That's in the very brief summary I think how I remember it was kind of structured. Would that be about right?!

Ir: Yeah!

Ie: Yeah, OK!

Ir: Do you have much of a feel for, to what extent you might already be complying with a lot of the measures that the code of conduct recommends?

Ie: Er, I feel that we probably do, because of the CCA. Because of that we already have to say where we are, set our sort of targets, I can't remember what the target date is. And obviously one of those targets, you've kind of gotta achieve it, or if you don't achieve it there can be penalties accordingly. So I would have said that we probably...I feel that probably the code of contact...conduct ... might be, shall we say a tiny bit more detailed in the way of, I don't know, maybe the auditing side of things, maybe? You know, it seems to me that the first thing you try to do is audit where you are. Maybe we haven't done that so much because we're fairly brand new. Maybe we felt not necessarily a need to do those sort of [inaudible]...audits. Erm, and then I think the CCA really drives it more.

Ir: Erm, do you have much of a feel for what, erm, other people, other companies you work with within the industry, do you hear the code of conduct mentioned much?

Ie: I used to spend quite a bit in...before I joined for...so I was a consultant, we used to go to quite a few different data centres. So yes, it did get talked about more. I think a lot of them haven't signed...necessarily signed up to it, but they were considering signing up to it, or were certainly interested in it. So...yeah I think there is a general interest. I think that might be more, possibly, on...certainly the guys that I always used to hear talking about it a lot more was kind of like on the operations side, you know the heads of operation and things like that. Whereas maybe what we'll find a little bit is like the CCA is maybe, sits a little bit within like energy teams, or finance teams. Because that's where...you know the code of conduct, I think...well it obviously will have bearing on energy usage and finance, but I suppose maybe energy usage is...sits a little bit more with the operations team, whereas the financial side sits with...well with the commercial side of the business. Yes I have heard of them...heard of people talking about it. And do you know the guys at IO? Sophie and...Robert Tozer, yeah? I know them reasonably well and I've sort of said to them cos I sometimes go to their events, certainly with the DCA events...that's the way I've sort of said oh I think that...because they were sort of fairly big players I believe, or certainly as I read you know in the code of conduct. And I feel that, maybe people do need to know a little bit more about it and I've sort of asked them, you know, encouraged them to well, maybe at the next one, maybe we should do a presentation on it so that everybody in the room understands much better. And then I think we'll get more of a sign up because I think at the moment, I don't believe it's...I've heard a lot of people talk about it, but I haven't heard of that many people sign up to it. You hear the big names maybe, you know within the UK people signing up to it. But I don't know in the co-lo this sort of market if so many people have. I'm not sure I'd love to...probably look that one up if you say they're all available. I would have to...

Ir: OK. Erm...

Ie: All I can see that it could help maybe more, just sort of thinking a little bit is that, because we are only a data centre company, you know, we are certainly part of, you know the CCA, and it's very very driven on that data centre side. Whereas it might come into play more, is if you're a big, a big, if you're a bank, you could say that maybe 80% of your energy uses is offices and everything else, and 20% is your data centre...that's when I think that maybe the code of conduct can possibly come into play more, because...in the grand scale of the whole business it's a very small number but... and therefore, you know things like the CCA might not be so driven by the data centre. So I can see then...and they cos that's what I'm trying to think, I'm trying to think of the people that I know that were interested, they're large, they're parts of very large organisations...the data centre is an important part of those organisations, but it's not, shall we say the big revenue side of things, there are other revenue streams. And I think those guys seem to be more interested in it.

Ir: OK. Do you think the sorts of measures that are recommended in the code of conduct are generally sort of cost effective things? And do you have any concerns about the effects they'd have on reliability and availability and things that.

Ie: Whenever you're implementing any of these sort of things that's the main thing you have got to...it...there's always gonna be, there's potentially always gonna be a business risk, I think that's you know, it's difficult to say oh, I think on a case by case basis you have to look at what the business risk is. Certainly I've come across companies as a consultant that would come round and do an audit. Would say you can save this, that and the other. But they would never really look at what risk it put the business at. You know it was all just to do with, well let's just switch everything off sort of thing. Switch everything off in a data centre and you'll save an awful lot of power, but you won't have a lot of a business! Erm, so I think that, you know, I think each case...when you sort of do your audit and come up with what you're gonna do, then yes, the risk of that...to make a data centre completely bullet proof you can just spend an awful lot of money and make it incredibly inefficient, but the, you know, it will never shut down. But certainly in our market, the co-lo market, we can't really do that, we have to, cos otherwise our clients will never come if we just keep...if we were, if we're billing them too much money, or if our commercials don't really work, then we'll go out of business. We're not part of a big bank or something as a side arm of a big bank.

Ir: OK good. Do you find err, that there's issues with differences of opinion between different teams about taking energy efficiency measures, and sort of how important energy efficiency should be.

Ie: I think it...using the experience on say the consultancy work...I know a particular company there...I think that there can be, erm...I think the saving energy is fine as long as it saves money. That seems to always be the driver that I see. And I worked with a company for about 5 years, we saved them quite a lot of, alright, an awful lot of money. By re-designing their systems or adding bits that would make it more energy efficient. Then there came a point probably about a year ago when they'd probably done all that was reasonably practical to do...and then as far as I'm aware, well what I was told, the budget went, kind of disappeared, so they'd certainly funded it for many many years to the tune of a few million pounds I would think or maybe a bit more every single year. Until they got to a point where it was like, well, we've probably done...well maybe we've done enough, they would be sort of saying. And then the budget kind of went. So...I think everybody in the data centre market wants to make their data centres more efficient. I don't think there's any doubt about that, it's just I don't know if everybody within the environment, you know, financially, will it pay back? Again I've heard different things, we've worked with one data centre company who were only interested if it could pay back in 18 months. Another one would be 3 to 4 years. And obviously that makes a huge difference to if it's really feasible or not. If it's anything less than a year, it's kind of like well, you almost can't, well...you almost can't do it. It's got to be massively inefficient to be able to save any sort of capital investment in that time. I don't know if that answers the question, I don't know if I went off a bit on the way...

Ir: Yeah I was sort of asking about differences of opinion between different teams within data centres, but...

Ie: I think within the data centres, you know, certainly within this sort of data centre, I think the drive of trying to make a data centre more energy efficient is more or less paramount really. Everything I'm doing at the moment, there's a very big focus on not only the energy efficiency, but also the efficiency on the amount of space we use and how we design it, financial efficiency, so efficiency all round really. And again it might well be different if it was a bank's data centre. They might have slightly different drivers...within the organisation. I would think within the data centre team probably not. But then when you went to the wider market which include traders and finance, administration, then yes I think there probably would be quite a lot of different views. As I've sort of experienced, you know the energy team was very focused on saving energy, then there came a point when they thought they'd done what they needed to do. The company needed to save a bit of money, so shall we say the 3 or 4 million pounds they had set aside for energy initiatives kind of got re-allocated. Do you think that answers it?

Ir: Yeah I think so. OK, yeah I was also gonna ask...do you think that the existence of the code of conduct has much effect on the way you operate? Or maybe more generally in the industry as well?

Ie: I think not ourselves, I think the CCA is much more a, it feels to me much more a driver. I hear more about that and also at seminars that we...you know I've just been to the Uptime Institute seminar because we're network members, so I spent 3 days with them. And certainly that's where Emma was there talking about the CCA. I'm trying to think...I can't remember, one or 2 people may have mentioned the code of conduct, but there was certainly, you know there was a whole presentation from her all about that. Also Greenpeace were there as well. So I feel that that probably has more of a drive, has more teeth maybe.

Ir: So the CCA obviously makes you, you have to improve your efficiency to be granted the CCA. But it doesn't really have any specifications about how you operate, or give you any guidance on how you meet the efficiency targets as far as I understand it. So do you look to other sources for information about what sort of practices you might be able to implement to improve your efficiency?

Ie: Not as far as I'm aware, I think maybe cos, again, we're newer. I would say certainly between me and the sort of CTO, we really just look at where the energy is going, we monitor, we have quite extensive energy management systems, and we monitor everything. And I think really we're always sort of looking at things saying how can we improve that. I wouldn't say it was necessarily too structured but it's, it's continuously, is there something we can do better, you know so even today you know we might have been using, our PUE might have been 1.4 here, and it's kind of like well OK, well where is that 0.4, you know, where is it going, you know? Is things running as they should be running. So I think that's probably more how we do it, as opposed to looking at any particular documentation to sort of say well, we should be doing this, this and this. Again, the code of conduct may well be, again...I mean, thinking, you know, a bit more broadly, maybe because, I suppose if you went to a data centre that didn't have, shall we say like M&E engineering, I can see that it has a lot of guidance on shall we say non-M&E people on how to approach things, but I suppose because I suppose I've been doing it for about 10 years now, trying to drive down the energy use in mission critical environments, no I suppose I don't look anywhere else, you've just gotta be kind of inquisitive and say well, why's it doing what it's doing, is there some sort of advantage there. Is there something that we can do. Er, and maybe even in our space you know, if we've said that we're gonna hit 1.6, and we can get 1.3 then, that commercially is a good thing for the company.

Ir: OK, good. Erm, do your customers ask much about..

Ie: I don't know...

Ir: Do they mention the code of conduct or...

Ie: I would have to ask that question of the sales team.

Ir: Yeah, OK.

Ie: I don't know...

Ir: Or if they, are they interested in energy efficiency more generally...

Ie: Oh absolutely. One of our clients who took a whole hall in [redacted], it's part...one of the reasons, they're doing a lot of consolidation of the data centres, one of the reasons...the whole company... I'm not really sure what they've got but they had...they're along the banking lines, they do have...I don't know if it's their own code of conduct or what exactly they've got, but there certainly, there is a drive to be as environmentally friendly as possible. And they've picked, I feel that certainly a driver was when they looked around, you know around [redacted], we're probably the most energy efficient that there is out there, within sort of that band. And I think they signed for that. So yes, certainly that client, definitely will. So I'd probably have to ask the sales team a bit more. I get the feeling sometimes that if you're buying 1 rack you may not care so much. But if you're gonna take you know, like a whole hall, and you're part of a large organisation, then yes, and especially probably a higher profile, they advertise on TV and things like this...erm, then yes, I know that it was definitely part of their, erm, let's say company ethics I suppose to do that. And certainly going forward, we have to report to them, their PUE, that's something that we're always doing to all of our clients. And I'm led to believe that they are obviously very interested in this number, and it gets reported back into the whole of their business. Which is also part of the reason why we don't report it now, because at the moment it's terrible. And they're concerned about a political, I don't know, maybe backlash to some extent, that they've gone to the new, state of the art, very environmentally friendly data centre, but because they're very...they're using very little power...everything modulates, but there is a point where...it has a minimum point, that below that, it doesn't really work properly. And because we have a service level agreement, we've said to them we will keep you in this band, we will keep you in this temperature band, the humidity band...unless they say to us, do you know what, we don't actually care about them anymore...but then they're putting main frames in, they're spending many many millions...and obviously they have drivers as well, so...if Cisco for instance, if the server went outside its band they might invalidate their warranty. So there is a kind of a knock on, which is the reason why I would say...we're not actually gonna start reporting to them until...we've got a couple of trigger points which will probably be around January. And then in January we think they'll have enough load for us to sort of say, look, you know, it's now worth reporting.

Ir: OK, so...

Ie: Yeah so, I'd say in general, I think it depends maybe where you are in the market, and what your ethics are as a company. But certainly I think as they get bigger there is definitely, as they get more sort of corporate, more enterprise type...I think there's definitely a big drive.

Ir: Erm...so you've talked a little bit about the Climate Change Agreement... so do you think that has much impact on the efficiency of the interest as a whole?

Ie: I think it's got to really, yeah. I do think, I think it does, you know. There are financial penalties if we don't, as a country. And no doubt they'll be passing them down the line. Erm, so yeah, I would have said that it feels to me, that's the bigger driver. I've heard, shall we say, more financial teams talking about that, you know like I say this organisation that had the funds for energy - when those funds were decided to stop, they, the next step they took was all to do with kind of, their commitment to that. And because of that they are deploying more metering into all of their, I don't know 1000 different sites they've got. So they can measure and monitor all of that, and they can record where they are and then project where they're gonna be. So...and I feel that was driven...well I don't have access to all the documentation but...as far as I remember that was all to do with the CCA erm, more than anything else. Certainly I don't remember the code of conduct being mentioned by that time. And obviously that team were more, I would say a commercially minded team as opposed to maybe a data centre team. They were looking at all of the mission critical, all of their sort of office environments as well. To, yeah to meet their obligations.

Ir: OK, so do you think something like the CCA works better than say a straight energy tax?

Ie: Oh, well...I think the differences between...I think anything where there's a penalty can get people focused on things, I mean...it's often difficult to get money to do projects, unless there's a...unless there's a driver behind it. Certainly all the energy calculations we used to do for the...we did used to bring in, I can't think what tax it was actually, now...it's to do with CO2. There's a levy for the C...yeah

Ir: The Climate Change Levy...

Ie: There's a levy, and that used to go into the numbers, I can't remember, it's like £12 a ton or something like this so, I think it's changed slightly lately, but, so there is obviously the energy usage, but then we would calculate that into, because there would also be a tax saving...was it a tax or a levy saving, I can't remember what it was now. Amazing how you forget things, I was only doing it probably 6 months ago! So yeah I think anything that's got a bit of teeth, and I think maybe that's, you know, at the end of the day, the European Code of Conduct, which I feel is what you're asking more about, doesn't really have those teeth although it's a good...I think it's still...I still think it's a good thing, but I think it's gonna be more in those sort of data centres that might be attached to another part of the business, you know it's something they can adopt and say well look, we are gonna sign up to it, and we are...and therefore it sets out you know, how you go about doing it you know, whereas you know, if they're not really part of the sort of CCA, then that doesn't have a driver for them. But yeah I think anything that has some form of financial implication will always get, erm, the commercial teams more interested. And...as much as, you know, we might always sort of say, well we wish we had more money, you know, the finance teams are always kind of looking at that. You know so I think it's always got to have something like that, it's gotta have some sort of financial incentive. The whole world kind of revolves around money. So if there's no financial incentive then you'll probably find that nobody does it. You only have to look at, in a smaller way... erm cars, have you got a car?

Ir: Erm, no...

Ie: Oh right. So if you've got cars, they obviously the government have incentivised people to drive down the CO2, now I know that's all gonna sort of change very soon, but you know, and it's something that I've certainly looked at, you know, I try and have a fairly, pretty efficient car that I drive, because I pay less tax. And then there's obviously less tax and less fuel usage as well, so the whole thing has a financial reward. And certainly at the moment I'm heavily looking at an electric car. So I would think in the next 3 months I will have, one of our cars will be purely electric. And the same sort of thing again, you know, it's cheaper to run, you know, less servicing, but also on the tax side. There's gonna be still no tax, there's no tax now and there'll still be no tax in the future. So I think anything that has a financial, you know... we all have to work to get our money, or you have to I don't know, go to sponsors or something to get your money...money is a commodity that I suppose is, let's call it maybe scarce, therefore we have to be efficient with it, and if one way, if the government keep taking it from you... so yes I think anything that has a financial implication will always focus companies' minds much more. Individuals I think can be a bit different, cos... motivated by many things. But I think as a company, as a money-making company, erm, it will always focus, yeah, the minds.

Ir: OK. How...you may or may not be aware, but a few years ago the US department of energy had a workshop with 100-odd data centre representatives and stuff, talking about ways that they might be able to stimulate energy efficiency improvements over there. But a lot of their recommendations were around things like subsidised energy audits, subsidised design services, and training programmes and things like that. Do you think there could be much use for those kind of measures? Do you think they could help improve energy efficiency in the sector?

Ie: If they were subsidised... I mean I could see if they were free, then everyone would probably have one. Subsidised - yeah it probably would because, again commercially, looking at people... I suppose the other thing we hear quite a bit, or certainly did on the consultancy side is, you know, people came in, they said they could do this, we implemented it, and when I look at my bills they haven't changed. And I think there was quite a bit of that. The validation at the end is important. Erm, so, that then started I think deterring people to sort of say, well, OK why should I spend another 10 grand with you, for you to come and do yet another audit when the last one just did it and we got no return. So I can see that there is obviously... if companies have suffered that before, then having another audit, they're not gonna be that interested but if it were subsidised so it wasn't as expensive, then I can see that they could do it. Yeah I think again, anything that makes it commercially easier for companies to do, they will probably take it up more. I don't know... but it is only a small part of it, was it subsidies to do what? Just workshops and designs and operation...?

Ir: Yeah...energy audits and design services...

Ie: I would have said that, from the, you know sort of experience of actually doing this almost end to end, and validating it at the end... those items there are probably actually the smaller items in a, on a... it could be a million pound construction job to implement it, the design fees could be in the 1 or 2 or 3% of that, so to subsidise that.. OK they might do the audits, and then it'd be like, well... subsidising the actual construction would probably be more interesting to people, and probably more interesting because it's just a bigger number. And again the commercial guys will look at it and go well we want a 2 year payback. And we get that. I suppose to some extent it would almost be like photo voltaics. The government give you an incentive for the whole scheme. Whereas if all they did was give you the incentive for someone to come round and do it for free and do a survey and say well you could save this, most people probably wouldn't, well they wouldn't. Individually people would take it up, commercially they probably wouldn't. You know individually, like I say people have different drivers, so... So I don't know, I think people would probably maybe do more surveys, but I don't know if they'd necessarily do more implementation of those surveys, because if they still didn't pay back then I think that would still be a commercial problem. You know, and I say, I would use the feed-in tariffs as an example of maybe how it should work, or certainly could work. But I think really what they've chosen, I feel that it's been flipped on its head slightly, and sort of said, well, under the CCA, if you don't do something, we'll actually tax you more. You know, so I think it's kind of gone, yeah, the other way, it's not an... they've not done like a feed-in tariff, they've gone the other way and said, if you don't do it... And that's really what Emma was kind of describing was that, you know, the carrot is actually 'we won't hit you with a big stick'. That's more the carrot, you know, not the other way round. There isn't really a carrot, there's just a big stick!

Ir: OK, good, yep, well that covers that. Well, my sort of, the practical, experimental and modelling aspects of my work all centre around aisle containment systems.

Ie: Right, OK.

Ir: So I was just gonna ask you a couple of quick questions at the end about aisle containment if that's OK. So you've got, as far as I understand it you've got aisle containment in most of this data centre, and...

Ie: Yeah, I mean within [redacted] we would say it's mandatory. Here it's not so mandatory, but we certainly strongly encourage it. I think it comes down to a lot of, how much load they're putting in each cab. We can see that again, there was a sort of return on this, you know, if you're gonna put one kilowatt in a cab, it might not really be financially worth doing. But if you're gonna put 10 kilowatts in a cab then we would say yes, you know, it's... we would I would think more than just strongly recommend it, we would be saying as part of the contract, you're doing it. And part of that... well I would have said that that is probably linked, although I don't know this for a fact, but if they don't do it, then we can't guarantee them the PUE. I think the... we've got to have our own sort of stick to beat them up with a little bit. Saying well, we can't guarantee your PUE because you're not doing all you can do to be energy efficient. So yes, I would have said that... and I think, you know, over the last sort of 10 years it's probably all that we've really recommended, certainly I've done a lot of, sort of, computational fluid dynamics. I spoke quite a bit with Jon about it actually, while we were at Data Centre Dynamics. And, you know, it's, to me it's very very clear that once you contain either of them, the whole system works so much more efficiently. Erm, so I think I would always recommend that they do it. And I think if it goes in day 1, the cost, you know, if you're fitting out, I'm thinking almost on the smaller scale, if you're fitting out an office with a data centre, or even a small data centre in it, and you put it in, it's gonna be pennies compared with the fitting out of the rest of the, you know... it's almost insignificant. So yeah, I think that it's almost got to really be done.

Ir: Primarily for energy efficiency or

Ie: Yeah, well, yeah well loads of reasons, I mean what you see a lot with the CFD certainly is, you know, air like everything is gonna take the easiest path. If the air coming out the back of the server, it's easier to cycle it back to the front of the server then it will do that. That can effect, you know, the mean time to failures, it's just the whole structure of the whole data centre kind of changes when you contain things. And I've done it in several different ways, I haven't just put containment in, I've actually dropped ceilings. So we bring ceilings down so they're only about, I think they were about I think they were about 3 or 4 hundred mm off the top of the cabs. And we found that certainly through the CFD that there was, it was, because the extracts were so close, the extract brought back to the cooling units were so close, the air did not cycle back round. So I think there's lots of different ways of doing, but yeah, management of our air, not just from the point of view of energy efficiency, although I would think that's probably the biggest driver... mean time to failures, yeah it might be 10 years, are they ever gonna prove it was really because of the temperature and all this sort of thing. And also temperatures are... a lot of servers now will run, you know, 35 degree in the sort of open compute kind of world, that's sort of thing, you know those sort of temperatures aren't necessarily uncommon. So you know, I think a lot of it probably is driven more from energy. But I can see and I've monitored racks and server inlet temperatures being all over the place because you haven't done it. And I would think that that probably is detrimental to some extent over the years. I'm trying to think if there are any other bits, I mean, those are the 2 main ones I would say, it's the sort of even temperatures, and then the energy efficiency. And I would think it still is the energy efficiency that the higher those temperatures we can get, or the more efficient that we can make our system and the less mixing, and the higher, let's say chilled water temperatures that we can have which makes the whole system free cool for longer... so I would think the biggest driver is energy efficiency, and I would think that there's probably also an operational side of it as well. But that's probably lesser, and less tangible as well to put a number to.

Ir: Do you get much resistance from customers on it, do they, are they mostly happy with it?

Ie: Erm, the only thing that I've heard... no I don't think so, the only thing, as will all these things it will come down to money. I feel that some people, and I have worked with some of these people, think that if you put a cold corridor on something you instantly save fortunes of money. And I've said well no, I don't think it is as, quite as easy as that, you know, at the end of the day, and I think there's also been proof out there that we've seen, that it doesn't necessarily work like that. Unless you're gonna modulate the fans, unless you're gonna modulate something else then you're not gonna... cos that's where the energy's gonna be saved, the performance of the data centre changes because of the pressures kind of change. So, yeah... and I think a lot of people don't necessarily like that. I have certainly been involved, or people have asked us to do validations, again this was in the previous role, on data centres where what they have sold to their management is 'we're gonna buy some cold corridors, we're gonna put them on, and it's gonna save us, and it's gonna pay back in 2 years'. And I'm sort of saying, well what other things are you doing? 'Well we're not doing anything else, we're just gonna put the corridors on'. You're not gonna raise the temperatures? 'Oh no we can't do that because of our SLAs', you're not gonna modulate? 'No because it's fixed'. I'm saying, well I can't be held responsible for if you're really gonna save that energy just because you're holding the air in there. Erm, so I don't know, I don't know what you've, cos you've modelled these sort of things?

Ir: Yeah...

Ie: I mean that's how I've always come across is that, unless you're gonna, if you're just gonna... if you've got a fixed fan then it will basically... if you're trying to push air into something that the air can't come out anymore, then you're just gonna move to a different place on your coils, you know the temperature over them, therefore you're gonna drop more latent energy out. And it was interesting that, something that my boss was going on about cos we were having a discussion about return air temperatures, and they did something similar many years ago, and he said it actually used more energy. And I was saying well i think the reason why is because what you then end up doing is because you move back, you're not doing so much sensible cooling anymore, but you still have a sensible cooling load, but now you have quite a latent load as well. He was saying his chillers were actually running more and I'm saying well I think that's why because your load probably actually went up just by putting a corridor on, because you know, your CRAC unit is now not working efficiently, it's not working as they designed it to work. So yes, I think they've got to be correctly implemented. People have got to understand them more. I think there might be a bit of a sales out there at the moment, where people are going around saying 'fit this and it'll solve solve all of the problems in the world that you've ever had'. I don't think that's fully understood, and maybe slightly over sold. But if correctly implemented, then yeah absolutely, I think to be quite honest I don't see why anybody would do anything else now.

Ir: Do you have much... obviously it's becoming increasingly widespread and lots and lots of data centres use cold aisle containment, or aisle containment one way or the other. Do you have much a feel for why it's not come up more quickly, cos it's been fairly well established as being a possible route for improving energy efficiency...

Ie: Yeah, I would really probably go back to money, you know. It's, they can be expensive things to implement. Especially if, you know, if this whole building, 30000 square feet or so, had nothing, then you would probably be talking in the hundreds of thousands of pounds. And like I say, I would have concerns if all you did was just sort of stick it in, and didn't do anything else, if the finance director would ever see that money back. So I would say it's probably pretty much driven by money. I mean the other side of it could also be just sort of thinking of other companies... sometimes it can also be that the people that are working in those data centres are just too busy. You know, they're so busy, and yes, that is something they'd love to do, but to be honest, they've already spent 12 hours dealing with everything else and they've run out of steam to really... so I think that's been another thing, cos I've heard lots of people talking about this but it doesn't seem to go too far, and it's often, when you talk to people you know, we're just so busy with this project and that project, I haven't had the time to do it. Erm, so I think time can be possibly another reason. You know and again if they're operational people that would like to do it, their role is not like my role, my role is a little bit more kind of, a little more strategic, a little bit more... so I probably have more time, or there's part of my role more to look at those sort of things. Whereas my operations team, or the operations team... they're busy dealing with the day to day customer issues, customer deployments... and if that's all the team you've got, and you have no engineering back up then yeah I can see there could be time, workload constraint why people don't do it.

Ir: OK.

Ie: Don't know if that's a different angle?

Ir: Yeah definitely, that's a good answer! Erm, well I think, yeah that covers everything I wanted to ask you. Unless there's anything you wanted to raise or, anything else you wanted to say...

[redacted]