Transcript BAA2

Interviewer (Ir): Thanks for taking the time to do this interview, we couldn’t do this research without people like yourself giving up your time, so…

Interviewee (Ie): It’s fine, [redacted].

Ir: Yeah…

Ie: [redacted].

Ir: Right so… so the interview basically, I’m just gonna start off with asking you a few questions about your job and the company you work for and some background information. And then I’ll ask you some questions about policy instruments relating to energy efficiency in the data centre sector.

Ie: That’s fine.

Ir: Give you a rough idea. So if we could start off, if you just describe your job role and what your responsibilities are and things like that.

Ie: Right well, within [redacted] I’m probably classed as a senior manager. So I look after 3 areas: the [redacted area which is all the enterprise servers, so you can feedback into this, er… all the storage for [redacted], and then the bit that you’re interested in which is the data centres. So erm, at [redacted] we’ve got a number of data centres, 2 of them would be classed as primary, so one’s based at [redacted], which is where I’m based. And the other’s based in the [redacted]. So both them data centres are kind of active. We try to split services evenly between them. So, and also, we’ve got capacity there so that if some servers or services fail we can fail them over to [redacted]. As well as that, our other main data centre is at [redacted]. And that kind of acts as a back up location if you like. So you know, constantly and more on a night, there’s snapshots of all the data being taken that’s kind of replicated to, you know, whichever one or the other primary sites, and then, on a night, that data gets sent off to a vault, a read-only vault. So, you know, no viruses can get on it unless they’re on it already, so read-only vault at [redacted]. Which means that that’s the 3rd copy of the data and that’s our kind of like safety net. Which also means we… for most of our systems we don’t need tape. So that’s kind of the environment. I kind of… so on the data centre site, I manage a team that’s got 2 managers who kind of manage the day to day data centre environment. And then underneath them they’ve got four shifts of 3 people on each shift, so they would cover the 24/7 – we almost cover 24/7, there’s a time onsite when there’s no one there for one shift. It’s historical. So basically if… what we have with the data centres, we’ve got preventative maintenance contracts in place. We’ve just put it out over the last 6 months and… we’ve got a new company that we’re dealing with, so they’ll come out and you know, check all of our equipment. Check to see if any parts need replacing. You can imagine there’s diesel generators, UPSs everything. So they do that. Anything else you want me to go into about that?

Ir: Erm, yeah that’s most of the things… so you’re responsible for kind of looking after IT and stuff, but how about the facilities side of things, do you have much involvement in cooling and the power provision and things?

Ie: Yeah, yeah. All the, what we… within [redacted] we’ve got a separate department that deals with facilities, facilities management… but because data centres are a little bit specialised, we don’t let them touch it.

[laughter]

Ie: So data centres is the little bit where facilities where we manage it ourselves. So what we do, because we’re not experts on it…. I suppose people like me need to know enough detail to make the right decision, but you end up not being an expert on UPSs and cooling etc. So although we manage it, we sub-contract it out to a company who, they do a lot of PPM visits – propert preventative maintenance I think it is, something like that. And also we kind of… if anything needs replacing or if anything needs replacing, the airflows and things, we’ll either instigate it or we’ll talk to them. So over the years we’ve kind of…. We’ve had a project which installs the free cooling at [redacted]. So the big external air intakes. And then… so we do get involved a lot. And this contract we’ve just signed over the course of the last month or so. One of the things that I did is, [redacted], I made sure there was a training element. So with them being the experts, they’ve got to, kind of, provide training to increase our knowledge.

Ir: Yeah, that makes sense.

Ie: So I think they do… the company who we went for, they manage data centres all over Europe. [redacted]. Cos you guys have got big data centres don’t you?!

Ir: Yeah.

Ie: Probably bigger than ours I would have thought.

Ir: Maybe yeah, probably. Yeah, so obviously it’s an enterprise data centre, presumably you don’t take work in from outside [redacted] or anything like that?

Ie: Well that’s a really interesting topic because what we’re looking at now, it’s a very hot topic at the moment, is hosting services for other people.

Ir: Right, OK.

Ie: So we have actually talked to the [redacted]. So basically what we’re doing is we’re talking to the health authorities quite a lot, cos within [redacted] there’s loads of different health bodies, [redacted]. So there’s a lot of data centres out there which… they, all of them tend to be smaller than our data centres, and less well managed. With them not being as mature. Take the hospitals, I suppose IT is important, but it’s not their core business is it? Whereas I suppose IT underpins everything [redacted] does, pretty much. So at the moment we’re in discussions with people just, with public bodies within [redacted]. And it could be that we all get together and we decide we can lead or host it, or it might be that we get a third party company, or we kind of build a new facility and host it as a [redacted] enterprise group. So at the moment we’ve got all of our data, plus we’ve got [redacted]. That’s a body that they can rent… they rent 2 racks off us, so we’ve got a kind of hosting area where they kind of they’ve just got the 2 racks. And then we took on board [redacted]. And they do the fringe services. And they do the fringe services, [redacted]. They were struggling with their IT technology, kept on falling down and everything. So what we did, we basically consumed them into our environment. And kind of gave them all of our kind of best practices, you know, ways of doing. They didn’t have a lot of say in any solution because you’ve got to make them one size, you’ve got to make them vanilla. And one of the problems they had is they’ve been tinkering with their systems over the years, which means that you know, when you skill them up they’re not maintainable, where with [redacted], if you go on to my laptop and someone else’s laptop, the functionality and the feel are exactly the same. You can take it to most of the buildings and you can get wifi connected instantly. So it’s kind of standardised.

Ir: That’s interesting. Oh yeah. How is the electricity bill for the data centres divied up, is it something that your team has responsibility for?

Ie: It’s an interesting one that, and it’s… we don’t, no. Basically what happens is, say, the central energy team in [redacted] manage the energy for all of the buildings, including the data centres. If you take the [redacted] for example, that consumes, [redacted] consumes a lot of energy, of which the data centre within it consumes a lot as well. So they don’t tend to just basically silo the data centres out. Which means that we don’t have a bill for the energy as an ICT department. And… so you could say there’s not an incentive to reduce it. There is from a moral point of view but not from a financial point of view. So the central team what they do is, they kind of buy powers quite a lot, so they kind of go out to the market and buy energy cheap and get the best price for [redacted]. There’s various people in [redacted], including me, who’ve got access to their systems. So I can go in and find out how much energy a particular building’s using. Unfortunately there’s… it’s not too hard getting the information from [redacted] because of how it’s all wired up. But [redacted] is a little bit more difficult because from their system’s point of view it’s the entire building, the data centre’s just one more room. So for us to get real true life figures is… we just can’t. I wouldn’t like to say to the penny, that’s how much our data centre costs. Which is a bit of a shame but…

Ir: Could you give me a rough idea what the size of the combined data centre floor space or power consumption… I mean obviously you don’t know with some of the data centres, but a rough idea…

Ie: Erm, would it be possible for me to send you that detail?

Ir: Yeah, of course.

Ie: Because we had a review [redacted] of our data centres and [redacted]. So we had to actually collect all of that information. How many racks, the PUE – or as best we could get it – and power consumption, everything. So there’s a lot of information there that you’d probably find useful. So I think I can extract as much as I can pass on. If you… would you be able to just take a note of that and just send me a list of actions?

Ir: Yeah, yeah. Erm yeah I was gonna ask how long the data centres have been in operation, I guess that varies, some of them are relatively new, and some of them a bit older?

Ie: Erm, yeah, well… the …. Again I should have a date from it on a spreadsheet. But the one at [redacted] is less than 10 years, because it was introduced while I were at [redacted]. [redacted] one probably goes back to the stone age!

Ir: Right! But it’s been re-jigged relatively recently?

Ie: Yeah. What basically happened – it’s quite an old data centre, but it’s… what was happening about 6 years ago, something like that, we kept having failures. And some of them were due to the power infrastructure inside the room. Some of them were something as simple as, there was a dodgy substation wherever we were getting us power from. So [redacted] used to just used to trip out. As soon as it tripped out, it kind of took out our data centre. Or rather at the time we were going through a UPS which lasted about 45 minutes, cos there was no diesel generator. But we ended up having a serious outage, and that were the time the money started flowing. So it was totally re-fitted. So basically it went from being no, not much resilience, 45 minutes UPS was the resilience, and we couldn’t monitor or anything, all the cables were under the floor, going up into the cabinet, couldn’t get accurate power measurements… so it went from that type of environment, to basically where nothing is under the floor, so all power and data comes down from above the racks, so it’s very clean, we had a diesel generator installed, and brand new LV room with all the kind of power panels coming in. Everything was new, brand new UPS which I think lasts probably about 10 minutes if that because…

Ir: It’s just to carry you on to the diesel…

Ie: Yeah, whereas before it was our lifeline. Now it just smooths the flow and automatically, you know, the diesel generator kicks in, which we test every month. Which is a key thing, you’ve got to test them. And so with all the power in the data centre, you know we’ve got brand new PDUs. So pretty much everything was ripped out. The only thing that was left was the cabinets. And even them, the cabinets, we used to in a lot of the cabinets we’d have PDUs at the bottom, which power would go into, then they’d kind of smooth it out for the racks. Or in rare cases it might even have a UPS in there. All of that was ripped out so basically power for each rack comes from 2 separate highly resilient PDUs over the top and each rack just gets basically 232 amp feeds into the power rails. So we’ve cut out all of the redundancy there. And although it’s not currently on their radar, but one of the things I’m interested in is the open compute project, because that kind of takes things a stage further, you know, with trying to, kind of like, instead of having like pizza box servers inside racks, it tries to treat the rack as one entity. So instead of having like power rails in every rack, and you might have some power distribution type things in racks, they just try to treat it as *a rack*, and that’s interesting because that’s a bit more efficient and just basically having the data centre as one entity rather than loads of little silos within it. So that’s something that would be a big change to do anything like that because at the moment each server for example

Ir: Has a specific job…

Ie: Yeah and each server has a PDU inside the server, so with Open Commute, you know, you could get rid of each PDU inside the server because why would you need… you know if you’ve got 20 servers in a rack for example, why do you need 40 PDUs? It would make sense just having 2. So you know, the future might be very interesting.

Ir: OK. You mentioned PUE earlier, that you had to report PUE, you don’t monitor PUE then on a regular basis or…

Ie: Er, yeah we do, in a fashion. I had similar discussions, a little bit of disagreement with [redacted] when they came in, because I believe our PUE is a little lower than what they think. I forget what it is at the moment, it might be about 1.6 or something like that. But they were basically saying for a typical data centre like ours it would be 2. But for the PUE, we measure all the air con usage, and the power from the servers and efficiency of the UPS and things. We’ve got a token, we factor in a token of 1 kilowatt for lighting and things. Just talking about [redacted] here. Cos it’s a lights out data centre. So we kind of factor in a lot of things, there might be just some fringe devices where we can’t include that in the figures. So they listed up things that should be included in our PUE benchmark and we were pretty much monitoring them all, factoring them into the equation. And because we collect all of the power and air con, the CRAC power usage on a weekly basis, you know, every week it generates a new PUE. And obviously it depends on what the weather’s like. So yeah.

Ir: OK. Alright well I think that gives us a very good idea of kind of your data centres and stuff. So if we move on to some questions on the, well first of all on the EU’s Code of Conduct for data centres, I don’t know if you’ve heard about or know much about this…

Ie: No, not a lot really.

Ir: Erm, so I mean basically it’s a code of conduct put together mainly with data centre industry folks in the UK, although it’s an EU administered thing. But it’s basically a set of best practices essentially, for data centres. So…

Ie: I came across it at one of the data centre events. But it was a case of interest as to whether it would bring us any value.

Ir: Yeah.

Ie: I’ll let you carry on sorry.

Ir: Well no that was kind of what I was gonna go on to really. So you read a bit about it but presumably felt that it perhaps wasn’t for you, or didn’t see the value for yourselves?

Ie: It’s probably one of them things that needs selling to us. So that we could see the value. Because as with a lot of public bodies, finances have been reduced and you’re having to make a load of savings. Data centres is a bit of an oddball because although it costs us quite a bit, you know, we don’t see the saving from the electricity because that’s a central pot. So it’s more of a finance thing. So it would be a case of, you know, it would be interesting to look at all of the, where this could help. But it’s then a case of how to implement it, because I imagine some of it will need specialised skills to come in and change things. And also data centres are one of them things where if you’ve got a blank canvas you can design it brilliantly. But if it’s organic, you’re screwed to be honest. So, I imagine, I haven’t looked at the Code of Conduct, what the different things are in it, but I imagine there’ll be a number of them where it’s a case that we can’t do that because of x, y, z.

Ir: OK.

Ie: But I am interested in it.

Ir: OK. That’s good. Is it something that’s been discussed much within [redacted] much then or?

Ie: No.

Ir: Do you have much of a sense of what impact the Code of Conduct has had on the industry perhaps more widely?

Ie: No I haven’t, and my perception rightly or wrongly, is that data centres, sizes, fit into different categories. And kind of, like, we’re at a size where we’re not huge, but we’re not small. So we’re in kind of like that no man’s land, where we could make efficiencies, but they’re not going to be on the scale of, you know you go to these events and their data centres need a power station beside them! So it’s a case of for them, when you get bigger than [redacted] you can start designing it and gaining the rewards by just the magnitude or the scale. Where I think for us, we’re just on that border. And the other [redacted]… erm they’re kind of too small, their data centres. So it ends up being a data centre, but a glorified comms room. So it’s like, cos you know with a data centre you’ll appreciate you’ve got to have contracts in place for the gas and all the UPS and everything. So it’s a case of you know, if there was, there’s be no real reason for us to be… that could be ticking the box, but we don’t have anyone who we need to show that tick to. If you were a… if you provided data centres, you know, co-hosting things, I’m sure if we went out looking for that type of solution we’d be looking to make sure that they’d got all these code of conducts, best practices. So I probably see it as being more, taken more serious, for the private industry people who are selling data centre space. I don’t know if you have your own thoughts…

Ir: Yeah, yeah well I mean you get a mixture of, kind of on the co-location side as well, a mixture of opinions, but yeah you’re more likely to, people obviously have to win contracts and things and it can come into it.

Ie: And it’s the same with the security standard, is it the 27001 or something like that. But yeah it’s good if we had that, but we’re not going to… it’s probably gonna be more of an overhead of maintaining the…

Ir: Yeah, I suppose the other thing for your organisation possibly, say for example when you had the [main site] data centre re-done out, you sub-contracted some of the design services and things. Is there an extent to which maybe you rely on sub-contractors to have an eye on energy efficiency, and maybe to know a little more detail on best practices and things like that?

Ie: Erm, yeah, yeah, definitely. And it is a worry for me. Because I’d probably say most of our skills are from, most of the skills of managing the data centre are through 3rd parties, so it’s their skills. And I would like me and also the 2 data centre managers who report to me to have a lot more knowledge on all aspects of data centres from air flow to power and everything. So erm, you know, simple example, what we did is we upped the, at [redacted], which is our biggest data centre, we upped the temperature in there to 26°C. So that was for the cold aisle. Because historically computers have been like, kept really cold, like 19 degrees or something. Where technology nowadays doesn’t need to be that cold. So what we did is, went around all the equipment, trying to gauge what the worst pieces of equipment was, were there any pieces of equipment that would start frying if they go up to 26, 27 degrees. And there wasn’t. So we upped it, gradually. So this is making quite a nice little saving. But when we got to I think it was about 26 degrees, when we got to that we kept on having some of the CRAC units tripping out. And [redacted] CRAC units. But the ones that were tripping out were so old that they couldn’t cope with that high a temperature. The others, the more modern ones could, but that’s kind of a nice example of where we had to drop the temperature by 1 degree because the infrastructure, the CRAC units which didn’t get replaced as part of the re-fit, probably the only thing that didn’t, although over time we’ve had new ones put in place. So it were the old ones that were kind of tripping out and I think we could make a lot of efficiency saving by ripping out the old CRACs and putting in more efficient units, but to do that, you know, I’d have to have some real figures and some proof as to when we would get the return on the investment. And also being strapped for cash, you know capital investment might be a bit hard now. But I suppose the big thing is, we’re in a bit of a limbo because we don’t know if we’re going to have shared facilities with the [redacted]. So it’s kind of like, don’t invest in something that you might end up not using in the future.

Ir: Erm, do you have much of a sense of what kinds of policies might encourage you to look more at energy efficiency, kind of encourage you to reduce your energy consumption, if not something like the Code of Conduct, then…

Ie: It would probably have to be something that penalised us, or kind of made us stand out from a negative PR point of view. So… negative PR, if we take that, you know like buildings have got like a building don’t they? People might or might not take that seriously if you talk about somebody’s house. I don’t know, if you see a house that’s a C or a D as opposed to an A would you not buy it? So if there was something like that but for data centres where it was a case of, it shamed you or you know, embarrassed you, cos… people kind of just like know that they need data centres, but they just kind of like, it’s like a black art, it’s a cloak over it, so they don’t… Joe public and things, is just… don’t appreciate what goes in there. So if there was something like that where you shamed us, or there was financial penalties if we weren’t efficient. Or any statutory requirements we’d have to abide by them. So it would have to be something like that, or something with teeth.

Ir: Erm, how about other kind of, support kind of mechanisms like some people have suggested maybe things like subsidised energy audits, and subsidised design services and training programs and things like that might be useful for certain portions of the data centre sector.

Ie: Yeah, I totally agree. I think, erm, on each of them items. So on training… I think there’s not enough training out there for people who operate data centres. I think people in big data centres, you kind of find that people run them, they aren’t as knowledgeable as you’d expect. So if there was some kind of like real industry standard set of training that basically said, if you’re managing your data centre you really need, this is the 101 of training courses. I do believe the British Computer Society are working with one of their partners to try to come up with something. But… that would help because I’d like people to go on training of how to monitor data centres better. Even things like you’d learn on day 1, such as the Venturi effect. So we had an example where one of our rows had the open grilles, but they were so close to the CRAC unit that there was

Ir: Reverse flow…

Ie: Yeah so it was sucking rather than blowing. We didn’t know anything about that! But that’s kind of like you know, it would be really good if like, you know, a really useful course that basically said, these are your musts, go back and check all these, and this is where you’ll get kind of like a good saving, and this you’ll get x amount. But I think there’s a lot of, I won’t say lying, but there’s a lot of kind of, made up figures in the data centre industry, so you listen to experts, you could have 2 experts side by side, and they’ll both say totally different things. So when you’ve got people who are classed as experts doing that, and you’ve people who don’t know the technology, don’t know the environment, like me, as much as them, it’s a case of who do you believe. So that was the training, what was the other ones?

Ir: There was things like subsidised energy audits, and design services.

Ie: Yeah, I think they’d be great, if there was a… if we could get someone to come in and look at the design. And we can, but there’s always the hidden motive of they’re wanting to make money out of us. If it was something where we could trust that it was independent that they’re not trying to make money out of us. And subsidise energy, I’ll have a bit of that for my home!

Ir: OK that’s good. I also just wanted to finish off with a couple of quick questions on aisle containment. On the kind of experimental side of my PhD I’m looking at aisle containment systems and stuff. Do you have aisle containment in any of your data centres at [redacted]?

Ie: Yeah we do, if you take the [redacted] data centre, we’ve got the butcher’s curtains, and blanking panels and everything. So that seems to work pretty well. So we’ve got that. What I’m a fan of, and we don’t have any of these, and I’d be interested to know your views, is the pod system. Because I think they would work really well, where you’ve got like a self-contained pod of say, 8 racks, with the air con devices built in.

Ir: Oh, OK.

Ie: You know. So it’s kind of… so rather than pushing air from, you know, I think we’ve probably got about 6 big air con units… rather than pushing air you know 30 feet across a room, it’s just gotta kind of like push it into the servers. So I’m not expert on them but I, just logically I think they seem like they’d be an efficient mechanism. The downside is you’ve got air con in each unit, then you’ve got to maintain, and you’ve got to double that up.

Ir: Yeah cos if one fails you don’t want that whole row…

Ie: Yeah.

Ir: OK. So what was your… have you got aisle containment in the other data centres or was it just at…

Ie: Erm, at [redacted], it’s not got enough equipment in there to warrant it, with it just being like the back up site. The [redacted]’s an interesting one. Poorly designed data centre. It was before I looked after them. I’d have been pushing against it big style. But basically what they did is they put a data centre in the basement [redacted]. But the room isn’t big enough, so basically everything’s crammed in, which means you can’t physically get aisle containment. So that’s a shame because I’d love to put it in but I’ve had a look and I just can’t work out how we would do it. You know. Because it is a small data centre. So it’s quite powerful you know, for its size, but… so [redacted] is our main, and then [redacted] tends to be the one where, we try to split services between [redacted] and [redacted] equally but you know, mainly the production side we do have a lot more equipment at [redacted] you know test beds, and things like that.

Ir: OK. What was your main incentives for putting in aisle containment at [redacted] then?

Ie: Cost. Yeah, it was one of them things where kind of, we wouldn’t be making the money back straight away, but because we were making so many changes to the data centre anyway, we, it was another thing where we could make an efficiency, we could bolt on getting the capital with the data centre refresh. You know, when we introduced the generator and put a whole rack in above, the power above the racks. So it was a logical time to do it. Because putting them in was a reduced cost to do it, because there were workmen in there working on that area anyway.

Ir: OK. I think that’s about it then, of what I wanted to ask you.

Ie: Yeah.

Ir: Unless there’s anything else you wanted to add, or ask or anything.

Ie: Err, no. I’m interested in you know, what work you are doing and what you’ve found out, if there’s anything you could…

[redacted]