**TRANSCRIPT OF RECORDED INTERVIEW**

**Stream If You Wanna Die Faster**

**Persons Present**

Teresa (T)

Mél (M)

Jenny (J)

Sharlene (S)

Corinne (C)

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T: Welcome everyone to Stream If You Wanna Die Faster, a conversation exploring the hidden environmental impacts of data streaming. I’m delighted to have four experts from across the fields of academia, industry and policy, to explore questions around the state of play. Who is responsible – is it ‘big tech’ or individuals? – and what is our future scenario? Mél, if you could open, please.

M: Sure. Thanks so much for having me. I’m an Associate Professor of Communication Media and Film at the University of Calgary in Canada, and I’m also the Director of the Environmental Media Lab there.

J: Hi, really delighted to be here. I’m Jenny Brennan. I’m a Senior Researcher at the Ada Lovelace Institute, which is an independent Research Institute, which looks to make data and AI work for people in society; and in a previous life was also a software engineer.

P: Hi, everyone. So, so excited to be here, and thank you so much for having me. My name’s Sharlene Ghandi. I am a former Tech Consultant, and I worked in the field of employee experience specifically, and about a year ago I made the jump into full-time journalism, where I focus on the intersection between the worlds of business and sustainability, often also digging into things like tech and agriculture.

C: My name’s Corinne Stewart. I’m a Senior Mechanical Engineer at Dyson, but the last year I’ve had a fellowship with the South West Creative Technology Network, and I’m now taking that work back with me to Dyson to start a role in the sustainability team, looking into the digital impact of big tech.

T: So, Mél, you’re coming at the angle from the data centre’s perspective, Corinne you’re looking at hardware and user behaviour, Jenny it’s software and policy, and Sharlene in terms of tech journalism, and communication. Given that, for those who might not know, really, in a sense, what are those steps behind when you do a search, and where your sort of data goes – perhaps Jenny maybe if you could give us a little overview of that?

J: Yeah, absolutely. I think it’s often really unclear to kind of a general internet user when you go online what the kind of physical impact behind what you’re doing has. So, for instance, if you’re listening to this podcast, maybe you’re on your phone, listening on a podcast app, or you’ve gone to the Container website, and you’ve, like, clicked through, and you’re listening on the Soundcloud, or whatever – that all has a kind of physical cost that kind of runs through it. So, if, let’s say, kind of, you went to the Container website, so you loaded that web page, and that hit your router, went off to the Cloud, as we might talk about it, but in practice that data is stored on a server in a data centre, and so there’s a physical place where that data lives, and that has… has consequences. It requires space – not very much, but it requires energy to run… to run those serves – it requires a lot of energy, often, to cool down the servers. It turns out, if you put a lot of computers in a room, if your… your phone or your laptop has ever got a bit hot, well think that, but with kind of thousands and thousands of computers, and suddenly you need an awful lot of fans, and each of those computers required, kind of, minerals and bits and pieces to build them. So, what for us feels like one click and a… a ‘hit play’, actually has a kind of a whole infrastructure behind it, and also a set of choices. So, where you’d… you know, where that data centre is will have different consequences. Which service, you know, that Container decided to build its website on will have different… different impacts, and I’m sure Mél can kind of dig down a bit more further into… into what that kind of data centre impact looks like.

M: Yeah, so when I last visited a data centre, which was in 2018 in Stockholm, the CEO of the Bahnhof told us, you know, as he was showing off this really efficient server room, that a few Google searches use the same amount of energy as cooking an egg, and I think it’s… it was a… it was a good comparative, especially if we consider how many Google searches are done, you know, every second around the world: you can start imagining how many eggs are being cooked. So I do think that that is… speaks to us more than, you know, speaking in watts per hour, for example. And the other example I really like is in… is the corporate anthropologist, Jane Ann Morris, who wrote a piece called The Bicycle Powered Internet, about 10 years ago, so the calculations are maybe slightly off, but the idea was that a well-trained cyclist produces about a constant 100 watts per hour on a bike generator, and that’s fine, but again a little bit sort of meaningless until you consider that a Google search activates between… I think it’s between 1,000 and 20,000 servers all over the world for a search, right, and then a Google data centre processes upward of 40,000,000 searches per second. If you do the math based on this idea that you would power with like, you know, human pedallers, she figured that it would require in terms of bicycle power about the equivalent of 350 football fields, and again, this is 10 years ago, so this grows exponentially, and I think the takeaway that’s interesting is that there… there simply aren’t enough cyclists on the planet to maintain the pedalling required to power our online habits, and I think the question that you asked was, you know, also pointing to the idea of, you know, the framing of individual activity in terms of energy expenditures, in relation to the global environmental crisis, and I think what we’re seeing is that we’ve outpaced ourselves collectively. And so I think these metaphors or comparisons, or, you know, more tangible sort of examples are really useful and interesting for thinking through things politically and poetically in ways that just forever seem intangible otherwise.

S: Also, when it comes to things like data centres, those aren’t physical pieces of infrastructure that a lot of people are actually familiar with, and I think we do often forget that. They often live in, you know, some sort of industrial estate, or somewhere out of urban centres, and, you know, I… I’m not even sure where our closest data centre is, for instance. So, you know, it’s that level of intangibility when it comes to the internet is really difficult for a lot of consumers and lay people to understand and grapple with, and I think when it comes to being able to… to quantify those numbers, it’s really about being able to ground it in some sort of reality, you know, whether that’s, you know, a physical piece of infrastructure that people can understand, and touch, and feel, and, you know, is part of their… their day-to-day life.

J: I definitely see with this that there’s a kind of contrast of us desperately needing this set of metaphors to communicate something that’s very intangible with how a lot of this technology is described in industry or in practice. You know, people talk about the Cloud, which itself is a metaphor, which talks about something light and fluffy, and natural, but in practice is actually talking about something that’s very hefty, and physical. When people say something’s in the Cloud, what it actually means is it’s somewhere in a data centre that’s large, hefty, dark, and… and using a lot of energy. And I think that’s a real disconnect that we see, and so I really like things that help us connect those two things together. For instance, I’m a big fan of the work of kind of artist and researcher Joanna Mull who does really exciting, creative work to kind of visualise what’s going on behind the internet. You know, if you search for something like Amazon, what’s all of the… the data and energy consumption in that process, and how to kind of make it feel more human and tangible. And I think there’s one more comparator that I think maybe… maybe it’s veering away from a metaphor, but I definitely find helpful in a policy context, which is that current estimates of the impact, for instance, on the environment of data centres are that they look like about 2% of global emissions, which is actually similar to the aviation industry, but we spend a lot of times talking about planes, and not very much time talking about data centres, or… or kind of what’s powering the internet, and so I think comparators like that, where they might not even be metaphors, but just understanding where the scale of the problem sits within the scale of other issues around the climate crisis, can be really helpful.

S: One thing to… to perhaps add to that is the sorts of industries that we hold accountable in terms of not only the media, and the way that media powers certain communication, and powers the way that we set agenda when it comes to the climate crisis, but also how that then informs things like policy, and, you know, we spend a lot of time, and rightly so, we spend a lot of time thinking about oil and gas; we spend a lot of time thinking about emissions-heavy industries. One thing that that ignores is all the other metrics that contribute to… to climate disasters. You know, things like water contamination, water waste, you know, flood risk; all of that is sort of ignored when we take an emission-centric perspective. But it also means that we don’t hold industries that are service-based to account as much. You know, we don’t hold consulting, accountancy, banking, the tech industry accountable at all when it comes to… to the climate crisis, and that’s very much something that… that the media maybe needs to take more responsibility of is, you know, how do we frame the climate crisis, and are we still stuck on thinking about single-use plastics?

T: Yeah, I think that framing is really interesting actually, and it kind of re… it sort of relates to a framing around ‘data as the new oil’ in a way, but it does highlight again these issues of… of the invisibility of labour and costs that are going into having intensive digital lives at the moment, and picking up on something, Mél, that you’ve also kind of written about as well, the ‘sacrifice zones’. What exactly, or how would you define a… a sacrifice zone, Mél?

M: Yeah, I… I think it’s really important, and I think it’s sort of echoing what Sharlene’s just said. It’s just when we talk about internet infrastructure, we have to really consider all the things that are upholding that material infrastructure, but also the… the culture of consumption around, and I think that when we think… maybe we… you know, we pay more attention to – sort of a generalised ‘we’ – to our online consumption, I think especially with Zoom in a pandemic, there’s been a lot of reflection on that kind of impact, right, that having our cameras on uses more sort of bandwidth, etcetera. But I do also think that less attention is still brought to, you know, the mining for rare earth minerals, for example, on one end of the supply chain, and at the other end, sacrifice zones are like where the e-waste ends up, right? So, I think this is often sort of separated from this conversation, and I think that a more interesting analysis is something that, you know, takes all of this into consideration because, like, without our devices, without the sort of disposability culture that we have around these devices, then the internet itself looks very different, right? So, we’ve created this giant mess, but it is material well beyond the cables that carry the… the fibreoptics, or whatever. You know, it’s like… yeah, it’s… I want to say it’s a social cultural and global in… in terms of how we might want to measure, and then hopefully rectify and manage the future of the internet. Unless we pull the plug, of course.

C: Yeah, from tech, from industry, then it is being kind of brought in: data as a saviour to a lot of problems that we don’t know we have yet. So it’s an idea that we can put sensors anywhere, and then we’ll be able to find products to sell, or invent products to solve problems that we’re not even aware that we need at the minute. I think there obviously is a true value in data because, without it, we wouldn’t be aware of the climate crisis; it helps us with a lot of what we need in our day-to-day lives, healthcare, learning, etcetera. But I think there’s a lot of applications, such as analytics of personal data, crypto-currencies, etcetera, where it’s now being abused to a level, and it’s completely unstoppable at this rate, and I think it’s fallen by the wayside of Governments and regulation, and I think there’s a bit of an irony when you look at people like Elon Musk, who are, although creating electric cars, which is great, he’s also driving Bitcoin up like through the roof at the minute, and it’s this cross-confusion for what is a green, sustainable future in tech.

J: Absolutely. What I’ve been seeing is that there’s a mix of both consumer demand, in terms of thinking about things like streaming, Netflix, Tik-Tok, etcetera, but also there’s huge industry demand for kind of large-scale data use, a general trend towards more data is… is better, right? We see it both kind of as a… as a general trend, but also even at the kind of top end of… of machine learning research – we see this kind of leaning on very large data sets to create cutting edge research. Recently Emily Bender and Timnic Gebru, and others, presented a paper that kind of pushed back on… on those kind of ideas, and thinking about kind of, for instance, the way that… that we can start to factor in the energy consumption of… of developing those models, or the climate impact of those modelling and that work into the very processes that form part of those kind of industrial processes, or those research processes – because I think they push at two things: not only kind of how we’re going about doing things, but also the purpose that we’re putting those things to. So… so, for instance, in… in this context, Emily Bender and others talk about large language models, so things that would be used to, for instance, do translation work, like Google Translate, or… or potentially generate new text, and they tend to focus on the English language. That therefore benefits predominantly kind of non-marginalised populations who will not be the first to feel the impacts of the climate crisis. And so I think there’s this kind of… there’s two-level approaches. One is kind of how are we thinking about doing this, and how are we not factoring in the environmental costs of… of work that are less transparent, but also kind of what are the purposes we’re putting this to, and… and how do those interplay with the environmental impacts of work?

M: Can I… can I add something to that? I think, you know, on the… just riffing off what Corinne and… and Jenny have just said, but I think we need to really take into account, you know, everything from Amazon workers trying to unionise right now, and also the… you know, that Google keeps firing these powerful women, women of colour, who are essentially answering questions of ethics that the company, you know, is claiming to pose, so it’s… you know, I think these are all also really important policy questions, and they are also informing the way the infrastructure is being built. And as we’re talking about large models, or large data sets, we also have to think about, you know, how Google and Amazon, again to pick on them, like, they are… they are… they have massive data centres, and when… you know, we’re starting to see hints that something like education will move towards something like Google, and we see that healthcare will move towards something like Amazon, right? Probably under different names, but these data sets are not… you know, these are not just companies hiring Amazon or Google servers to do their work; there’s sort of an exchange, and we see this… you know. Something I’ve looked into is just genomics: you know, Google genomics will… or, you know, for… for a while would offer for a lot of that data to be stored, but then they would have kind of this ‘first dibs’ on any sort of discovery made around genomics. So that’s just one massive example of the way it’s just these industries are… are… they’re sort of joining together with where that infrastructure lives, right? So, I think these are… they’re… they’re questions about materiality and about politics, and about policy that are really sort of mutually reinforcing each other, and so… and the fact that people who push back against this get fired, or… you know, or worse, I think sometimes, can suffer quite a bit of push-back.

T: I guess it goes back to this tension which, Mél, you’re also kind of flagging, regarding, you know, corporate responsibility, individual responsibility, and that question about when we think about, you know, recycling, for example, there’s a lot of emphasis based on the individual to sort of be a good citizen on that level. But of course the question then is where does this… where do these individual habits of change, when ­– even when they scale up – are they comparable or as effective as… as changing practices on a corporate level? What are your thoughts on that? Could we even see a future where someone is at fault for streaming too much data, or… or getting a fine for that?

M: I wonder if it’s actually just a… a sort of a… like a false dichotomy, or a way to draw attention from more important questions, and I think this has been done by the oil industry before, to say, you know, “you do your part, you change your light-bulbs”, etcetera. And I think, if we’re thinking of that kind of industry itself, by saying, you know: Is it a problem that, you know, Zoom uses up a lot of power?” Sure, but I would say that that’s not a good comparison, right? I think that what we need to do is basically address sort of the… the deeper issues of the industry itself, and not be distracted by these, I would say quite minor… relatively minor. On the other hand, if you take… if you compare it to recycling, you know, recycling also relies on global infrastructure, and, you know, if it sort of breaks down in China, and China says, “no, we’re not taking any more of this” for whatever reason, then it… there’s not really the kind of blow-back where people will stop recycling because you don’t want to have a whole sort of culture of people who have lost that habit. I think it’s much easier to go through the motions of having people keep recycling, even though there is a breakdown sort of in the system. So, I think these… that dichotomy you’re saying, you know, individual versus industry is just… is sort of misleading, and sort of our go-to, so that we can feel a little bit better if we, you know, manage our own data, or, you know, we can say, “oh, I don’t watch Netflix,” or something like that, but I… I actually think they’re just two totally separate issues. And I might, you know, later just… you know, if we want to get into this, also talk a little bit about how data centres build themselves in the image of climate change increasingly, and use even the language of sustainability, and all of this, and I think that might be worth opening up as well.

C: I’d like to add that I think industry and consumer are two key people in this, but I think we need to remember the kind of internet service providers that are also responsible for a lot of the energy that’s consumed, and the transmission of the energy, because that can be like half of the energy to watch a film, so if we’re only looking at Netflix and the user, that misses a big gap, which is paid for in like your broadband deal for the month, or your phone deal for the month, where that’s kind of, get this high speed, really lovely, quick, cheap deal, it’s like glamorised, it’s sold as like be-all-fix-all as fast and quick as you can, and then I guess the other one is the Government, or whoever’s the policy maker, and it should also be in that. So, it’s kind of four people in the conversation, I believe: the industry, the internet service provider, the consumer, and the policy makers.

T: So, yeah, I guess, picking up, Mél, on that point that you were speaking to on the… the narrative of data centres at the moment in terms of sustainability, and then Sharlene and Corinne come back in.

M: I think, you know, some of the things that I look at in relation to climate change is just how we are very set on making the infrastructure itself withstand increasingly harsh, and essentially destructive, planetary conditions ­– instead of addressing the problems of neo-liberal policies, and colonial extractivist capitalism, right? Like, it’s an easier fix to turn to technology than to disentangle all the extremely problematic and often violent sort of human underpinnings, right? So, I look at this, but I do it in a… in a sort of roundabout way. I, for example, will… you know, we… we’ve seen in the last few years that, you know, California’s been through severe droughts and forest fires, but what if we look at that in sort of… in relation to the number of data centres that there are there, and the amount of electricity that consumes; the incredible amount of water required to cool those servers, right? They generate a lot of heat, and so there is a really, sort of, obvious relationship between the inside climate of the data centre, and the conditions that are required to maintain it. I also like the example of the hurricane Harvey devastating Huston – this was in 2017 – all the residents were displaced, and there were major power outages, and thousands of them were… were basically, you know, out of luck, but the data centre stayed open, and they had cots and showers, and even washing machines, and they became these sort of, you know, bunkers; they became these safe places… safe from tornadoes, from ice storms. They’re actually built now to say, well the con… planetary conditions are going to get worse, so we’re going to withstand that, and the last thing standing will be data centres, you know? 10 years ago, I was speculating – like, who would have dibs on the water in… in a time of crisis? And I think the Huston hurricane shows us that, in fact, the data centres, the industry, will have dibs over energy, water: all the things they need to operate. And I think what we need to maybe think of is that these industries are ‘big tech’, but they’re also real estate companies; they’re also increasingly energy companies, and I think that that complicates a lot of the ways in which we can offer up a critique. Anyway, lots more to say about that, but no… I’ll pause there.

J: I was going to say, has someone written the dystopian novel yet where, kind of, you know, post-climate crisis, the data centres are being maintained, but kind of humans… humans live in the remaining wasteland, but at least they can stay connected to Instagram?

C: Do they turn off heart support, or do they keep the data centres on? I hope it wouldn’t come to that.

S: I think sometimes we forget to have some of the more radical discussions that underpin things like industry and economics, and we… we often stick to that level, but, you know, those things don’t exist without often quite ‘fluffy’ sounding concepts: like community and, you know, how we interact with each other; and how, you know, human life has become in… in this like incredibly heavily technological system that we now all exist in. And, you know, we… we struggle to… to apply a… an idea of radical change when it comes to… to thinking about technology and the role that that plays. And, you know, we often think about tech, and data and streaming in the context of work, and especially now that we’ve all moved... well, a lot of the… the world’s population has shifted to working from home, and there’s now that… that higher reliance on data and tech – but we don’t often think about it in the context of social relationships, and, you know, the reason that… that a lot of these platforms exist, whether that’s social media, or streaming, or, you know, Tik-Tok, as we brought up earlier, or even N… NFTs.

T: An NFT is a Non-Fungible Token.

S: A lot of the reason that… that a lot of that exists is because we have just become fragmented as a society, and it’s that sort of chicken and egg question of: did tech lead us to become a fragmented society, or did the fragmented society lead to tech becoming as ubiquitous as it is today? But, you know, radical change really requires us to think about how we form community, and how we interact with one… one another as people. And, you know, just a… a super simple example of that is, if we remove ourselves from this mindset of fragmentation, we are able to connect with each other a little bit more, and, you know, that’s… that’s just the bare bones of an example that allows for… for human connection to… to come to the forefront again, and just, you know, reduces our reliance on this tech-based communication that we’ve… we’ve become so… so used to.

C: Just off of what you were saying about our connected societies and connected lives that we now have, then I read Cal Newport’s Digital Minimalism, and he talks about having conversations rather than connections, and I think that’s something that has really stuck with me. I think it’s quite easy to be pressing ‘like’ buttons, which then trigger people back onto their devices, or, “oh, that’s a really lovely picture,” and I think it’s just, instead of aiming to staying connected, to aiming to having proper conversations with people, because that does so much more good in the world. So, it’s just kind of going through all the interactions that you are having in your connected lives, and working out where there’s real value in the relationships you form on them.

T: And I guess with those who are listening, it… it would be useful to explain the hype and the buzz around the NFT, which Sharlene you were going to… to speak to, so go for it.

S: Right. This is going to be difficult so strap yourselves in. NFT stands for… for non-fungible token, and I suppose the… the concept of fungibility is what needs to be explained here. And essentially, in a nutshell, the concept of fungibility is when something can be exchanged for something of equal value. So, say one pound is exchanged for another pound, or a dollar for a dollar. Now, non-fungibility operates on the basis that a token, as it were, you know, whether that’s a piece of art, or a piece of music on the internet, or increasingly just, you know, what people are calling ‘moments’, so like the NBA is selling off, you know, really famous moments in their broadcast history; the way that that’s traded means that there’s a slight mark-up every time it gets traded between different hands. Now, NFTs have obviously blown up because, from a sort of utopian perspective, they apparently have opened up the world of art specifically to emerging digital artists, and that’s why there are just so many people jumping on the hype, and, you know, obviously, this idea of, sort of, compounded wealth means that an artist that produces a piece of digital content benefits every time that piece of digital content is traded in… in the NFT system. So, the other flipside to that that a lot of people really, really aren’t talking about – and actually there’s an emerging sub-culture of digital artists that are now addressing the fact that NFTs have a huge, huge, huge climate impact. They produce art in a digital context, but because of the crypto-currency transactions that an NFT trade requires, that is where the… the climate impact is centred, and so these digital artists are saying, “actually, no, we don’t need to partake in that,” because the impact is so large that rather than changing a system – so say, for example, the art world has been so traditionally undemocratic, it’s been inaccessible to a number of different people, whether that’s small businesses, or digital artists that are just emerging – it’s been so inaccessible, and the NFT world seems to open up this possibility. But at the same time, all it’s doing is adding another layer of inequality onto the discussion rather than sort of thinking about the original system of how art is traded, and trying to… to unpick why that world is unequal. It’s just created another inherently unequal system, which I suppose, chimes into… into what Mél was saying as well.

T: You know, I don’t… I don’t know enough of the consumption realities also of… of NFTs. I don’t know if anyone can unpack a little bit of that, because I do agree that, on one point, that it’s definitely a future that is not going to go away, anyway soon, I think it’s probably just going to potentially increase in its uses or forms.

C: Comparing like buying a print from someone on Etsy versus buying an NFT of the same picture, well then the print would be about 2 kilos of CO2 emitted, whereas the NFT would be over 200, so it’s like a hundred-fold for energy consumption, because it’s trying to get those transactions done with the crypto-currency. But I think there’s another issue, in that the kind of trades on the blockchain, then there’s only so many can be done at a certain time, and this kind of like ‘gold rush’ mentality to get NFTs is kind of crowding out potentially more socially productive, or more environmentally sustainable things that could be happening in this tech space, and it’s diverting a lot of energy of brilliant people onto something that’s potentially not got that much value, other than monetarily.

T: I guess this kind of goes back really to a closing kind of question really, and maybe a radical perspective in a sense, you know, should we abolish the internet? Should we… should we start from scratch again, knowing all what we know right now? The internet in one way is the… you know, the massive backbone and mainframe through which all these bits of data, including NFTs and Bitcoins, and personal data, and all of the aspects in which data can manifest, flows around. Do we need to re… to re-tweak that in the same way that we’re constantly having an ongoing debate around what is democracy, and what are the frameworks that support is? Is that what… is that the headspace that we kind of need to be in?

M: It’s a really good question, it’s a really good provocation: should we abolish the internet? Because my gut instinct, like on a purely personal level is: yes, let’s just get rid of this. Like, I just remember a time where things were just better. You know, I have this like very strong individual personal sense that, like, childhoods were better before the internet; human connection was better. On the other hand, we wouldn’t have the Covid vaccine if it weren’t for the internet, and I think that that’s a kind of a big deal right now: a very concrete, tangible example. And then I want to flip it again, and say, but because we have the internet, there are things like QAnon and the crumbling of US empire, and of their democracy, and probably not just in the US; the circulation of disinformation, and the power of disinformation is also a by-product of the internet. So, I… I think I could keep flipping sort of the pros and cons like that all day, and not really settle. So, that’s the worst answer ever, but it’s the most genuine.

T: Go on then, Jenny, take a dibs at this. Should we abolish the internet?

J: So I think I have the opposite instinct to Mél. As someone who doesn’t really remember pre- the internet, my natural instinct is: “But I would break if the internet broke!” Which I think in and of itself maybe says something! But something I have been thinking a little bit about is… is, I guess, putting my web developer hat on, is how we think about the kind of the complexity of… of what we do, and the unnecessary complexity. I think… I can’t remember the researchers now who refer to this as kind of data waste. You know, I think I start to… I first started building websites like nearly… over 10 years ago, 13 years ago, or something like that, and they were a very simpler thing. I think there’s an interesting kind of design and development resurgence of like the ‘vintage internet’, if you like, where everything’s much more manually created, much plainer to look at, but also much less data intensive. I think there’s something in kind of thinking about some of the more simple fundamental information-sharing uses that could maybe support something like the creation of the Covid vaccine, that don’t necessarily require all the bells and whistles that we… that we see now, and… and how we could maintain some of those pieces whilst thinking about… thinking about challenging some of that… that knowledge and kind of infrastructure and the… the centralisation of those experiences on the internet.

S: Shall I give it a crack?

T: Go on.

S: I… I suppose my sort of immediate… where my brain goes to is – and this is funny as I’m saying this, I’m realising that we don’t have this system in place – but I think most people who are familiar in any capacity with the climate crisis are aware that, you know, carbon crediting as a system has been thought about for a long, long time without much… without much impact or implementation, and you know, I wonder whether that’s an approach that we take to… to internet usage, and, you know, just to come back to… to what Jenny was saying about, you know, waste data use, and, you know, just really critiquing where that time and that energy is going. And I suppose in a… in a sort of roundabout way, it falls down to… to regulation, and, you know, the internet as a business – the internet as an economy – has never been proactively regulated. It’s always been regulated in a reactive way. And, you know, we see that in, you know, the hilarious deposition that Mark Zuckerberg went through a few years ago, where like, you know, people didn’t even know how Facebook worked as a business model. So, you know, how can you expect that the internet, or the complexity of the internet can be regulated, when our governments and policy makers just aren’t aware of the complexity that it poses? So, you know, on one hand, I’m like the dissident voice in the business community that… that loves a bit more regulation, but it really does fall down to regulating in a way that is able to… to foresee where the internet is going, and, you know, just to come back to NFTs as a closing point, it’s a completely unregulated space at the moment. You know, the climate impact is one… one part of that, but, you know, people simply selling NFTs as their own that aren’t their own work is a… is a completely different example of a space that just isn’t… isn’t having any, you know, regulation done to it whatsoever. So, I suppose that’s… that’s where my head’s at, is, you know, similar to Mél, you know, sort of in-between the… the two camps, but thinking about whether or not a, sort of, radical new approach to… to regulation, and treating the internet like an economy is… is where we need to start.

T: It’s interesting about that point about regulation, and I did… one strand of my work look… looks a lot at surveillance, and surveillance histories, and I was particularly focusing on CCTV cameras, and… which generally got rolled out in the late 60s/early 70s, the beginnings, but really massively in the 90s, but it was only… and… and the UK being one of the intensely surveyed societies in the world on that level. But it would… it took… if you take, sort of, ‘68 as a point to ‘20… I think it was 2015 or 2016 before there was a commissioner that was appointed to look at issues around privacy in relation to CCTVs on the street, and how it might be an invasion of personal privacy. So I think that’s a kind of an… a marker in a sense, and Facebook is another good example – I’m glad you brought it up. You know, what we’re basically sort of seeing is a bit of a pattern of: the tech gets done, it gets rolled out, and there’s a 20 to 50 year gap before any sort of real consideration of what’s going on in terms of the rights that it might be invading, or the issues in relation to the environment, or the social limitations of it, etcetera. So I think… you know, I… I appreciate your point there on… on the regulation. Corinne?

C: Yeah, so I guess my answer to whether we should delete the internet is that, currently probably only 60% of the world have access to the internet, so that would be a bit mean to the other 40% if we said they couldn’t have it – because it’s been pretty great for us. And I think we have to also remember that we’re right at the beginning of the journey of humanity with the internet, and with data; we’re still learning, and I think we’re lucky that with innovation electricity costs money, so… and materials cost money, so that will drive some innovation and efficiencies in business. However, whether that’s going to be a quick enough rate to catch the issues that that’s causing to the environment – so I think what I’m pledging to try to lead is to switch to thinking about data in a lean way, and trying to reduce not only consumption, but also how much is designed into things. And I think if we start that from the beginning rather than later on down the line when it’s too late, and pioneer in that way, then that will be the best we could do because we’ve started to see what’s happening with the impact of the data centres, although I do like having an internet-free day every now and then. It’s a very welcome respite.

T: We’re on the brink of, you know, having lived now with the internet for 25+ years, and it’s still a bit of a wild west, and the NFTs is a good example of that ‘wild westness’ that’s kind of happening, and land grabs, and I think that’s why we have these conversations around, you know, data colonialism, because the ‘extractiveness’ of it is pretty intense. And then I think the work that we are all engaged in that we’re doing at the moment is at that edge of trying to navigate – be it in our scholarship, or in our artistic practices, in the regulations, in our thinking through policies, or thinking through how to communicate this beyond the… the tech sector – we’re working in industry and trying to spark those conversations with our colleagues. So I just want to say that, thank you for… for bringing so much generative thoughts to… to the table really. It feels like something that we could kind of continue with, and… and I’m sure that we will post… post this podcast, but is there any closing comments, or thoughts?

M: In terms of assessing the environmental costs of this podcast, if we, you know, use this egg analogy that we started with, I think that we’ve made at least one big quiche.