[Start of recorded material at 00:00:00]

Facilitator 1: So you can see it there, so the way it works is that this way, you can read it upwards, the length is the duration of time, and the height is the consumption, the power level let’s say. So everybody has their own – some people I have improvised a little bit, and added some more things, so if I saw that there were not enough, so I tried to make it though realistically, like a real day would be for some of you it’s a Saturday, for some of you it’s Tuesday, but it doesn’t really matter because the idea here is that we’re going to try to see how collectively your days would look like.

So the scenario we’re going to play out is that you have a solar panel collectively, that you have purchased together, and that when it’s been in use then the power of it gets divided by three two to you three, sorry to you four. And so everything that is inside the solar curve, I will explain what this is, then everything that gets generated by the solar panel is divided by you three, and everything that is extra that is consumed outside of the solar panel, then everybody pays individually from their own electricity account, as would be normal currently.

And what we are going to simulate is some days of the year, we have two of them, and we’re going to see how you can, in which ways can you coordinate among yourselves to make the most use out of this panel, OK. So let’s start by – this is an example of the generation of what this solar panel would generate, so here you see the hours of the day, like 1am, 2am, 3am, all the way to the night, and the power. It’s a relatively small panel, so it's like 4.8 around there, around five, and this generates, this is for an example of consumption for a very sunny day actually, so you can see it starts at 4am in the morning, it starts having sunshine and then it’s generating energy, there are some clouds somewhere there in the morning, and then it peaks there in the midday, and then it gets dark slowly by 8pm.

So this is a June 12th day, this is real data from [Anonymised] one of their installations but scaled to a smaller extent because their installations are quite big. So what I would like to start with is like you use your – you take your data, and you place them on the day with – you have a little piece of a sheet here that actually shows which time you have documented that it started, and what you were doing, and so you can see where it should be going on the graph – yeah, I think I pressed it, yes. And the way you read is like the letters are always written, you always read right side up, so that one is flat.

H2: Oh sorry, that way up.

H10: Shall we try and do it at those times that are on here?

Facilitator 1: I mean these are the ones that you have documented, but if you feel like it was wrong, or if you feel like you would like to put it on another time, that’s still OK, but these are the real times that I had documented in the paper.

Facilitator 2: For the time being the aim is that you’re not trying to move them around or anything, just putting them when you actually did it.

H9: Can we put them on top of each other?

Facilitator 1: Yeah, yeah, on top of each other no, sorry I mean like on top on that side.

H9: Up here.

Facilitator 1: Yes, exactly. Maybe you could put that at the bottom and push everything up.

H9: OK, oh no, that’s two weeks of breadmaking, I felt I had to explain myself.

Facilitator 1: I was wondering what the – and then you can put the yellow one touching back down because – yeah, exactly. OK, what do you see in your – this is a day of all of you together.

H2: Much more use on this day, this part of the day.

Facilitator 1: Yeah.

H10: We should eat at lunchtime, not in the evening.

H2: Yeah, earlier in the day, yeah lunchtime anyway yeah.

H9: Yeah, when we have the most parties we’re using probably – well not the least but much less.

H2: Less, so yeah, more activity in the middle of the day.

H9: Which means we’re having to pay for it and it’s extra all these ones, if they could come in there, they could be part of the energy that’s being delivered.

H10: Replace our dinner parties with lunch parties, everybody gives up work in the middle of the day.

Facilitator 1: Is that something you each individually see about your own patterns?

H10: I’m delighted to see I can get my breakfast cup of tea in there, that’s very satisfying, wouldn’t want that to be bumped out.

Facilitator 3: Does anything surprise you about either your own blocks that you were given, or the way it looks?

H10: It makes you realise that if you’re turning the oven on, you should use both shelves, not just one.

H2: Yeah really max out.

H10: Yeah, that could be good, I’m sure you were with the bread, whereas I just know that that – I don’t think that was using both shelves from what I remember.

H2: No.

H10: And it’s that you shouldn’t do that.

H2: No, when I used it wasn’t definitely.

Facilitator 2: Out of interest do any of you broadly familiar with when you might be using electricity during the day like this from other things that you’ve looked into?

H8: No I don’t think I’ve ever thought about it to any great extent before.

H10: I think that because in my house the gas usage dwarfs electricity usage so much, I probably don’t even think about the electricity, it’s like the problem is the gas, that would be what I’d be tackling, whereas obviously, and it wasn’t a typical – exactly the five days the meter was on somebody was staying with me, a friend was staying, so it was a completely atypical – everything is for two people not one, it doesn’t matter.

Facilitator 2: What about anyone else, has anyone got an idea of when they would normally be, or what their electricity use pattern normally looks like?

H2: No, I’m a bit like you, I was saying that to you [Facilitator Name] wasn’t I, it made me realise that I am very dependent on gas actually, so yeah, but yeah, I suppose it was interesting to see, but also I was a bit less active unfortunately, when I was doing this as well, so yeah.

H8: I’ve got a smart meter, so I do keep an eye out when things – if there’s something really high going on I’ll see if I just left anything on, but it could be me. But yes, I know we could present well this is a bad habit, but we try and run the dishwasher, so we set it for midnight, but we typically don’t do that.

Facilitator 1: Why is it a bad habit?

H8: Because we were running at 7/8pm when it’s probably the most expensive as opposed to setting for a timer when it goes on at 2am.

Facilitator 3: When you say the most expensive, do you have a tariff that differentiates between –

H8: To be honest I have no idea, I just assume it’s cheaper, I have no idea.

Facilitator 2: Cheaper to you, cheaper to you or –

H8: Cheaper to me yeah, I’ve always assumed – is it electric I’m not sure, post-midnight I assumed it was cheaper.

Facilitator 1: There’s just less, they’re supposed to have less – how do you say it, the grid is supposed to be less –

Facilitator 4: Less pressurised in terms of demand.

H8: There are some tariffs where you pay less overnight, like Economy 7 you might have heard of.

Facilitator 3: Yeah.

Facilitator 2: There are very few people relatively speaking are on that tariff, if you are, normally you would know about it, but that’s what I was wondering about whether it was priced for you because your energy supplier would be paying more for the electricity at that time, the price they buy on the wholesale market is higher, but we just hear it all flattened out, so yeah you’ve got the right thinking, but they’re the ones who are picking up the cost rather than you.

H10: I’m wondering what that would look like in the winter because that was an exceptionally hot week in the UK, and when you think how much more you make soup and toast, and put on an electric heater, I don’t know you just do more things with electricity don’t you, when it’s cold.

H2: I mean I suppose we were using fans during that hot weather, or at least I was anyway, which I wouldn’t normally do obviously, so maybe compensated a little on that I suppose, but yeah you’re right, in the winter the usage would be a lot more wouldn’t it.

Facilitator 1: I was impressed with the difference between the two ovens even, even amongst the four of you like every oven seems to be a completely different story.

H9: I was really surprised how much electricity an oven uses up and everything, considering that it would be the heaviest usage.

Facilitator 1: OK, and this was bread making, what was that?

H9: Yeah, we make all our own bread, but we do it in big batches because it’s an expense in the oven otherwise, so like a whole morning making lots of bread and freezing it for a few weeks usually.

Facilitator 2: So yours kind of looks bad because it’s so big, but really if it was individual baking sessions over multiple weeks, it would add up to a lot more.

H9: Yeah, yeah definitely, again we’d never do that, and that seems worthwhile when you just put in one.

H10: I was surprised that – because you know you told us only annotate the peaks, not the there’s this general underlying I’ve got a laptop on, and I think I expected the fridge to show up, a fridge freezer and of course it doesn’t, it’s just part of that little low level thing which is presumably your laptop, charging of phone, I don’t know, the stuff that doesn’t show up.

Facilitator 3: Yeah, the things which are on standby.

H10: Yeah.

H8: It would be great if your smart meter could give you this kind of information, and let you know much more when you’re using stuff, and when you’re not.

H9: I don’t have one, is it just usage it shows – it goes up and down?

H8: It will tell you what you’re consuming now, it will tell you today and how much you spent weekly, monthly, yearly, so it’s kind of useful but the real interesting things are the trends and that kind of stuff, especially if you had something like solar.

H10: It’s more about money isn’t it, the smart meter, it’s more you’ve spent 72 pence today, or that sort of thing.

Facilitator 1: And you also have a smart meter right?

H10: Yeah.

H8: I did download an app called [App Name], which takes your smart meter data and visualises it, I’ve just connected the two, I haven’t actually looked at it yet.

Facilitator 1: OK, so was it the – were you surprised when you saw your data visualised, your consumption data or not?

H8: To be honest, I thought it would be more, yeah I knew this was going to be high, that’s like the dishwasher, so but yeah, I thought the oven would be a lot more than the dishwasher, so yeah.

Facilitator 1: Surprising, OK so as I will repeat the scenario here, so we have a common solar panel, where everything that is inside the underneath the generation curve, then that gets shared amongst you four, so that gets shared evenly. And anything that is outside you pay with the normal tariff, so 30p per kilowatt hour more or less. And anything that is generated by the solar panel, but it isn’t used, so for instance these grey areas that are still visible these actually go to waste right now right, and this won’t go to waste, it goes back to the grid that you would earn from that let’s say, 5p, these are just imaginary numbers a little bit, that would also be divided amongst you four. So it’s on your benefit to figure out a way to have as many things underneath the curve as possible, right.

H8: How does that work; it goes back to the grid at 5p and then you buy it back for 31?

Facilitator 1: Yeah, that’s how it works.

H8: Somebody is making a good spread there.

Facilitator 1: That’s why it’s in your benefit to try to use as much as possible from the solar because actually the solar in this scenario we’re playing is free, so anything you use directly from there is basically like you’re getting it for free, you have the installation cost of the solar panel, but you have already done that. So which of the activities you see here could you shift to do them during the day and try to think of realistically of those days that were coming through, like which of them can you do earlier, how can you move them.

H9: Well this was actually an unusual day, normally it is at the beginning of the day we do that, so it was just so happened that day we didn’t have time, so normally that would be right here.

H10: Can you put it here.

H8: I think if you shift all those other ones up.

Facilitator 1: Yeah, shift the other ones up.

H10: It’s easier to move washing than cooking isn’t it because washing doesn’t matter so much as when you eat your meals.

Facilitator 2: Well, baking is a good example I think of one because it’s not tied to eating.

H10: OK, yeah, yeah, that’s true.

Facilitator 1: But for you –

H8: I’d probably shift this here ish, maybe more like that actually.

Facilitator 1: You can put these on top.

H2: Yeah, I think that was a bit of planning that could have been done, put that somewhere in that kind of time.

Facilitator 1: So you are available during the day to do the oven?

H2: Only at present I am, yeah so just go along with my pattern at present – yeah – but some of it’s going to be about planning isn’t it really, yeah.

Facilitator 1: Yeah, and your son as well is something that.

H8: Yeah, I could do that and go here.

H2: Yeah, that could have been changed.

Facilitator 1: It seems like you’re all pretty flexible with your schedules.

H10: Not with my breakfast cup of tea.

Facilitator 3: Not breakfast cup of tea no.

H9: And the dishwasher definitely could be within that because it only goes on once a day, so it’s pretty flexible when, it takes a day to fill it up.

H2: Yeah, and again that could –

Facilitator 1: You can shift it up, OK almost there.

H8: There’s a sneaky one sitting on top there.

H2: That’s the dishwasher as well.

H10: The computer.

H9: The computer.

H2: Oh sorry. But yeah, it does depend on one’s schedule doesn’t it, because obviously, like I say at present I am flexible but –

H10: But the computer could fit in here, if the washing – the washing shifted a little bit couldn’t it fit, do you see what I mean.

H2: Yeah, definitely yeah.

H10: Am I doing a weird thing though just moving all the washing to fit the computer in.

Facilitator 3: It’s like a little Tetris or a jigsaw puzzle.

Facilitator 1: And how realistic is this with the lives you have right now with your family, kids, pets, is it something that you could actually indeed shift and be flexible?

H9: For me it would be very easy because I work from home, so I’m around the house pretty much all day.

H2: Yeah, I mean I’m mainly home based at present, so yeah, but I don’t know maybe it will change in the future, so yeah at present I’m flexible.

H8: Me as well, I’m three days a week at home, so easy to shift.

Facilitator 1: Great, you as well?

H10: Yeah, I work from home currently yeah, it is just that thing about when people are invited for dinner, you kind of have to put the oven on just before they come, you know.

Facilitator 1: Yeah, special events right, where you cannot do anything about it.

H10: But washing, washing could happen whenever it needs to happen.

Facilitator 3: Do you think if you saw it kind of visualised in this way it would make a difference to what you did, like does this feel different to how it looked when it had all the gaps in and the things outside the curve, or do you think –

H10: Well, it’s so much to do with knowing about other people’s lives isn’t it, which you just don’t because you are flexible, but there’s no point in one person thinking oh I’ll be really helpful, I’ll move my washing over there, and then everybody’s just moved it to the same place, you do need to see a collective smart meter or something or book a slot in advance or something like that.

H8: I do think it’s that kind of adage, it’s measured and managed kind of thing, but I think my friends who have got solar panels they really actually manage them, like they’re quite interesting, they’re on the app all the time.

Facilitator 1: Like looking at when to do things?

H8: Yeah, exactly, but a shared solar panel it would be interesting as well, I agree you’d have to see collectively, it be quite a good community thing actually.

H10: Yeah, totally.

Facilitator 1: And you’re also considering installing solar panels?

H8: Yeah, we’re in the process of doing that solar together thing.

Facilitator 3: A collective solar?

H8: It’s called [Project Name] – it’s a group buying thing, but they partner with [City Council], I think they do it all over Britain, and they do a reverse action, and you can sign up to the thing, it will take a long time though I think.

H10: I was going to say, if you find a single builder prepared to come out and do some work can I have the phone number?

H8: Yeah, I’m in the queue as well.

Facilitator 2: Well hold that thought about what you were talking there about the ways in which you might coordinate because that’s something we’re going to come back to.

Facilitator 1: Exactly, maybe first we’re going to try to do the same thing with a more difficult day that is not in June but it’s in March, so if we can take our –

H2: Take our bits and pieces away –

Facilitator 1: Bits and pieces away. Right, so we have a day in March which is still actually a pretty sunny day for March, you still have like a peak, but then you can see there are intermittent clouds, the day starts much later, it starts at 7am rather than four, and then it gets dark already around a little bit before six. And then you see there are intermittent clouds during the day, you have some peaks, but it’s not June.

H10: I’ll pay for that cup of tea.

Facilitator 1: Yeah, let’s try to put things again here and then see to what extent could you – let’s see first what it looks like again, and then what would you shift in this case?

H10: Shall we put the biggest ones on the bottom.

H2: Yeah, OK.

H10: You can put your really big one, we all like bread that’s OK.

Facilitator 1: Maybe with your collective bread you can give it to your neighbours as well.

Facilitator 3: Yeah, we’re not accounting for the cooking of the bread, we like to share it.

Facilitator 1: Exactly.

H2: Is there a bit more space?

Facilitator 1: OK, so what did you decide to leave outside, which because it won’t fit anyway?

H2: Sorry, say that again?

Facilitator 1: No, I mean I see here for instance there’s a washing machine, like you left it outside –

H8: Oh sorry, is that the washing machine, sorry.

Facilitator 1: No, no, that’s fine I thought you did it on purpose.

H8: Oh yeah, well I can put it there.

H2: Squeeze it in.

H9: Because some things like that because that’s when we get up and we shower, and it’s not going to change, the time is not going to change.

Facilitator 3: Needs to be realistic.

Facilitator 1: It needs to be realistic, OK. There is also an element here that we’re seeing this in hindsight, so we already know that the day is going to be exactly like this, so then you can actually plan the activities like that, but in reality it will never be so perfect right, because we will not know that in one hour there are going to be clouds, and we need to be able to do that, what we just did right, you took it and you put it on the peak.

Facilitator 2: I also want to say as well, is that two washings at the same time?

H2: No it was over a period – it was over three hours actually.

Facilitator 2: It was two separate washing occasions?

H2: No, it was one cycle, but it was –

Facilitator 2: Oh it was one cycle –

Facilitator 1: OK it was done separately.

Facilitator 2: Oh I see, it came up as two, OK fine.

Facilitator 1: OK.

H9: That was because it was – it must have been a Saturday because there were – I think it’s because we do totally different things on that day, so a second person had a shower at a completely different time, normally we both get up earlier, so I could put it somewhere there but it’s in the morning.

Facilitator 2: Is it a week day?

Facilitator 1: Sorry?

Facilitator 2: Is it a week day?

Facilitator 1: For everybody it’s a different day, it just happens to be the busiest day but because each of you have a different profile obviously of a household, then for some of you it’s a Saturday, for some of you it was another – a normal day. But let’s say this is the most strenuous day in terms of energy, so if you would have really a common solar panel then that would be like the most difficult situation in which you would have to coordinate, and that’s why I chose to have this kind of scenario, OK.

H8: Would a common panel be housed on people’s roofs and then shared effectively, or is it a case of solar partners or something?

Facilitator 1: Well in this case we’re doing a really simple scenario in which it would be like on people’s roofs, and then we were assuming that you live close to each other, and then that you would just share it like that. But the next question we were going to have is what if it would be through an organisation or through some farm, which if you want you can –

Facilitator 3: Yeah, I mean I think it can get quite complicated because there’s different models of how you can share energy, so some of it is to do with having a kind of contract that means your energy prices are lower because you’re sharing resources that are generated by solar panels that you’ve invested in, or that you’ve been part of. Some of it could be from, as you say, from a solar farm, and then [Faciliator 2] you probably have a better kind of sense of some of the scenarios.

Facilitator 2: Yeah, sorry I was slightly thinking of something else when you were talking about that.

Facilitator 1: But at least in this case we’re making the most simple scenario of let’s say that it would assume that it’s on your roof let’s say, and you live next to each other, OK.

H10: And is it that if all of that power had been used up it just reversed to the grid, what you need comes from the grid and as soon as some becomes available it’s that called on first?

Facilitator 3: Yes, exactly, exactly.

Facilitator 1: And in this scenario also we don’t use batteries or anything like this, so it’s a very direct use from the panel, and I have a question here, you have this really beautiful laid out puzzle, jigsaw, you have aligned it perfectly, in real life how do you think you would go about coordinating yourselves to make such a perfect jigsaw?

H8: The scenario being that we’re all neighbours and we all have a shared solar panel.

Facilitator 1: Exactly.

H8: OK, and we import it ourselves.

Facilitator 1: How else would you make this, right?

H8: I assume we’d have an app, most people I know with solar panels get an app that will tell them what’s being generated I guess, so is – I don’t know, would the manufacturer provide something that would be able to coordinate us –

Facilitator 1: And what would it show?

H8: Sorry?

Facilitator 1: What would it show?

H8: Ideally visualisation of the, I was thinking how much energy is being generated now, you would assume that they could have predictive – based on what the pattern is, I think they could predict what was going to come, what might be there.

H10: Would you have to book a slot, suppose you knew you were going to do a great big bread bake, and then – I’m just remembering when I was student, if you wanted to use a washing machine you had to book it, we are talking 100 years ago, but like you signed up to book a washing machine so you didn’t go down and then – so maybe if you knew you needed to do a big bread bake you’d have the option to just book it so the rest of us left you a clear run.

H9: Yes.

H10: If we were nice.

H2: You would have to plan to a certain extent and be aware of your schedule to be able to share that information, so that you can communicate.

Facilitator 1: Do you find that realistic for you, do you think you could?

H2: For some things yeah.

Facilitator 2: What sort of things?

H2: I mean like cooking to some extent I think, even using laptops, yeah I mean I think it will be just about becoming quite conscious of best times to do those types of things and working out what each things were flexible.

H10: You’d have to be sort of sensitive to other people going – cooking is harder to move, general cooking of a meal is harder to move than washing, so if you were coordinating with other people you’d have to be a bit sensitive to, it’s easy for me to move my washing than someone else to move their dinner, I’m not quite sure.

Facilitator 1: How would you do that?

H9: But would it be enough to have discussions about this where you look at maybe this through the year and just develop a much better understanding of the right times, and just do the best to achieve that without it actually being I want that slot. But then obviously, it wouldn’t be, this is the optimal way of getting the best results, but maybe something close to that would be achievable.

H8: If you had a little light that showed you’re getting green, you’re getting free energy, red you’re not getting free energy, it could get quite annoying probably, you’d be thinking I’ll move my washing and then you’re baking bread.

H9: Could be a bit competitive.

H10: Or is this quite satisfying to see how you’re doing against a target, like a Blue Peter fundraising style thing, so if you know collectively, maybe not individually, but you know collectively how well you’re falling within a boundary, maybe that’s quite satisfying to see, a bit like, oh we did quite well today, we were all within, I don’t know.

Facilitator 3: Could you have a kind of tariff that was evened out across everybody if everybody did really well at using the solar panels, and you all benefitted rather than trying to individualise it.

H10: I just meant the smug satisfaction –

Facilitator 3: Oh you like the smug satisfaction?

H8: You could have – to that point, what you mentioned with the fundraising, you could actually have like a weekly report on how much energy was exported to the grid for pennies, versus use by the community, and then maybe sort of say here’s some times where if you’re thinking about doing something – that’s free, avoiding finger pointing out and stuff.

Facilitator 1: So in your scenario it would be – progressively you would learn with the app as the app goes on right, so then we wouldn’t have a pre-fixed schedule of booking systems, but you would use it and it would educate you along the way on how to –

H10: That’s interesting.

H8: But it’s the perfect application machine learning, it could basically say hey, what’s your name sorry?

H10: [H10 name].

H8: [H10 name], hey [H10 name] we noticed you do X, Y, and Z at a certain time, maybe you should move it a half hour to this time because you’re more likely to get free energy, all that is readily available to do.

H10: Yeah, it would do that wouldn’t it, yeah.

Facilitator 1: OK.

Facilitator 2: Just quickly there, a couple of things I wanted to ask about that, firstly I mean you were just describing a scenario there where you were thinking I might do my washing now, and then you suddenly realise that he started baking his bread, I mean that’s obviously a situation that could – if people aren’t necessarily booking in every aspect of their life, if it could arise, and I know it’s a bit abstract but I mean, do you think that would be awkward, thinking now this person has jumped in my slot?

H8: I think if you had that real-time view of what other people are doing, it probably could be awkward, but I think looking at it more historically saying, this week we did really well, this week we didn’t do so well, would be probably less contentious.

H10: And the penalties wouldn’t be so bad because it’s not like if somebody goes in the shower, and then somebody else starts washing up downstairs and their water goes cold, that really pisses you off, whereas like if he’s baking his bread, and then you want to do your washing, it’s not the end of the world, it just means somebody is going to spend a few more pence from the grid isn’t it. So it’s kind of like it’s not a massive penalty, do you see what I mean, it’s not awful, and that’s probably to do with how much we – it’s like we care about it from an environmental perspective probably more than the money, so we’re probably all thinking, yeah a few more pence, do you see what I mean.

Facilitator 1: Yeah, that’s what I was going to ask you now, how do you see it, you see it in monetary terms right, because you can actually see the booking slots like you were saying, some time slots are actually cheaper for you to do somethings than others right, like you can also see it from that perspective that if I do my laundry now it’s free, or if I do it in the app like a little bit later it might be costing 10 pence because somebody else is also doing stuff, or if I do it in the evening it might cost 30, I don’t know. Do you see that as a way to – like would it be interesting to see let’s say your laundry, or your washing, or your dishwasher in terms of money how much you have paid?

H9: Yeah sure, I mean if I had solar panels on my own roof, I would become acutely aware of them, and I’d really enjoy being very boring with those.

H10: I think if I’m just really honest about it, my gas bill so dwarfs my electricity bill, 3p, 10p is neither here nor there, I can’t tell you what my gas bill is, it’s hard to separate it out, it’s not like I don’t care, but the financial aspect isn’t that significant when you’re looking at a gas bill, that’s all. And maybe if they were – no offence to anybody, but maybe if it was a slightly younger group of people here, they might be a bit more financially sort of on that kind of thing, I don’t know.

Facilitator 3: I think it’s about –

H10: Apart from you really.

Facilitator 3: And maybe this is about thinking forward into the future a bit as well in terms of if things that we currently power by gas, whether that’s your heating or your hob, ends up being powered by electricity, does this then start to become more interesting?

H10: Totally.

H2: Yeah definitely.

H10: Totally, we were talking about the heat pumps weren’t we downstairs, that changes the whole thing.

Facilitator 3: It chances it, yeah.

H8: But if I had a heat pump there would big old block right in the middle there because it would be – you’d be basically using an electric boiler, essentially you’re spending the max, you’d be running that pretty much all day, and if I had a heat pump and none of you guys did, you’d probably see me as being a big consumer of maybe consuming maybe a disproportionate amount of the solar power.

Facilitator 1: So you would benefit more from the solar panel than others.

Facilitator 2: I mean in this scenario that we’ve concocted where you’ve each I guess invested in a shared solar panel, and then you’re splitting the free electricity between you, then yeah, if someone’s using a load of the electricity maybe they wouldn’t be the most popular one. Would it be worth – you were talking earlier about the different models by which this could be dealt with, this relates to the price issue which Julia was mentioning there which is effectively in this situation, if you are saying within the curve there you’re getting it for free, whoever is using it, if you’re outside of it, it’s 30 pence, and when you’re selling excess, those grey bits back to the grid, you’re selling it for five pence together.

So I think possibly a more common way in which this sort of situation would arise is one, I guess those of you who’ve dealt with [Charity Name] might be familiar with, which is where a community organisation would make – would do the installation, would install a shared solar panel basically, so it might be on the top of a building, and you might have invested in it, but essentially they’re doing it. And they’ve obviously got to make that work economically, so they need to sell the electricity to someone, if they’re just selling it to the grid at five pence per unit, that’s not like an economic prospect for them if they can’t make money out of doing that.

So they need to sell it at the best price they can possibly get, so in that situation, when you’re using it outside of the curve you’re still paying 30p, but when you’re using it in the generation, you might be paying let’s say, 15 pence, OK. So this is the situation where it’s a community organisation, they’ve installed it, basically when you’re within the grey you get a discount of 15 pence, but because they’re getting 15 pence from you instead of five pence from the grid, it’s good for them.

So it’s – it adds a slight sort of difference to the possible motivation, which is that it’s still a saving for you, not as much, but it’s also the more you can consume during that grey, the more in a sense the community organisation benefits. And I just wondered if anyone had any thought or reflection on – I know it’s again, probably quite difficult to imagine, but whether that would be an important or meaningful consideration for you when you were doing this, how it would rate and relate to the savings you can make?

H8: So they put solar panels on a school, and then they sell that energy back to us, how – do we subscribe to them as an uptake or something?

Facilitator 2: Yeah, I mean these are things which we’re looking a bit forward in terms of what can be done under the regulations at the moment, but it might be a situation effectively where you’ve got your normal electricity supplier that you normally have, but you’ve also got a deal with essentially a contract with this organisation – with the community organisation to get your electricity from them when they’re generating. So yeah, you’d be – when it's coming from them you’re paying, essentially paying 15 pence a unit to them, when it’s not coming from them you’re paying 30 pence a unit.

H10: Is there – stop me if this is a complete down the rabbit hole, is there another way to look at it which is you can see when you’re using electricity that was generated by fossil fuels, and when you’re using clean electricity, because I just find that more interesting to know than 15p here, and 20p there, it’s just a different way, it’s just like how do you stop using fossil fuels. If you told me, if you make your cup of tea then, you’d just used fossil fuels to do it, it’s like, ah now I’m interested.

Facilitator 2: Or like, what about if it said now you’re using grid electricity, now you’re using school electricity, your community electricity, is that a similar sort of –

H10: Yeah, yeah, it’s similar, I don’t know to what extent grid electricity is clean.

Facilitator 2: It’s – grid electricity really varies between – so on average in the UK it’s about 40 percent of the electricity comes from renewable sources, about 40 percent from gas, and about 20 percent from nuclear. But it varies between almost nothing to about 60 odd percent renewables, so it’s definitely important to know, and you can get that information now, in fact I run a website where you can get – but I won’t be quoting that, but OK, but not just price information, contextual information about any information about where the electricity is coming from.

H10: Maybe just to me that’s more interesting, but I can see that –

H2: I’d prefer to know the money was going to a local organisation if I was using it for the good of the community basically.

Facilitator 1: But it would be an equally strong motivator to shift your energy, the fact that you would do it for the local community because you would still be paying right, but you wouldn’t –

H2: Yeah, I don’t know, I’d have to, yeah possibly not so strongly motivated, but it would be somewhat motivation.

Facilitator 2: What about, I suppose you could combine the idea that you were suggesting, which was some way of seeing the cumulative, I mean you were talking about the amount that you’d managed to self-consume over the week or something, but it might also be a totaliser of here’s how much you’ve paid, or the community organisation has raised or something from electricity sales this week or something like that. Any other reflections on that before we move on?

H10: So this community organisation with the solar panels might be also generating income for good causes, not purely to cover the costs for another, oh OK.

H8: I love the idea, if I could buy energy off the school, the school benefits, it’s green energy, it’s additional it’s not [unintelligible 00:41:00] whatever, yeah I mean I really like it, and they get a more bigger bit of money, we get a discount.

Facilitator 1: How about you?

H9: Yeah, I’d be very keen on it really.

Facilitator 1: It would still require you to coordinate though in order to figure out a way to make the most out of that right? And but in reality in real life, you mentioned various ideas, like one is that you see how much electricity generation is right now, so then you would know how much is green, or how much is coming from the school, you mentioned booking slots where you book into the future, like another way to coordinate. There was just learning, like letting the machine learn your mechanisms, your patterns and showing them back to you, so progressively you would figure out a way to do that.

And you also mentioned one more where you would say that you just see an overview like this – correct me if I’m wrong, this is what I understood, you see an overview like this, and then you kind of let it – you just hope that people, not hope, but you assume that by seeing something like this then people will understand more or less people’s patterns, but then there’s not a lot of intervention right?

H9: Yeah, I mean that would be the lowest level of –

Facilitator 1: Coordination.

H9: Yeah, and presumably the least effective for that, you’d get a less effective system on that, but it wouldn’t require a great deal, except to learn a little bit, and be engaged enough to learn from the sessions like this.

Facilitator 1: Yeah, and what about having fixed dates, like you say that Tuesday’s are your days to do larger electricity, to use a big consumption, or do your laundry days, like you get Monday, you get Tuesday, you get Wednesday, you get Thursday, what about something like this.

Facilitator 2: Be honest.

Facilitator 1: Yeah honestly, not hypothetically, would you be able to shift your life and coordinate in this kind of way?

H8: We’re not organised enough for that.

H9: It would be hard, definitely would be hard.

H10: When it’s a mixture of things, having a shower and using a toaster, and boiling the kettle and all that stuff, you can’t do it all on a Monday can you, having a shower for the week on a Monday, that is difficult isn’t it, whereas if it’s something big, a big bake, a big wash, you might be able to do that mightn’t you, to schedule a weekly big wash or something like that.

Facilitator 1: Do you imagine having another way, like live communication, like you have a WhatsApp group or something like this, and you say I’m going to do this right now, but imagine it a little bit with – you don’t know each other, I mean how much do you know your neighbours, so think of it as a real scenario, do you think you would?

H9: I think it would be hard, although having said that, I do that at the moment with – we’ve an electric car, and there’s only one charger on the street, so I put notes on every electric car on the street saying can we set up a WhatsApp group, and we share the charger because it doesn’t have a designated space, it’s not for electric cars, anyone can park there. But it’s almost always an electric car parked there because we’re in touch with each other, and we –

Facilitator 1: You do it through WhatsApp?

H9: Yeah, I just set up a WhatsApp group, it was so easy to do but then that’s a car on the street, it’s not your home, and your activity within your house, and I think that is another level of that.

Facilitator 2: How does it generally go; I mean does it –

H9: It’s been going absolutely fine, I was a little nervous setting it up because I just thought I don’t want to make enemies on the street, I want this to be friendly, but it’s been great. And actually I’ve got to know a few people I never knew before, really nice people, yeah there’s now I think four of us, it’s not a big number yet, but we’re sharing one charger and it seems to be going fine. So we just say like, can I jump on it now and charge.

Facilitator 1: So it’s having like – you don’t have a –

H9: Yeah, but it’s – I mean often – it’s usually my car there actually because it’s right outside my house, so it’s me often moving my car to allow them to charge.

Facilitator 3: And you said it would be more complicated to do it with the house, what is it that –

H9: Because it’s more personal isn’t it, if I want to bake my bread – maybe my car is just – it’s a very minor inconvenience me going out and moving my car, there’s always parking on our street, I suppose that’s the other thing, if it was hard to park on our street, then it may be different, but there’s always the space like a few 100 – well metres away, so it’s not massively inconvenient, and of course I’m there because I’m working from home, so I can nearly always accommodate them. But yeah, I don’t know, it just feels different saying do you mind if I bake my bread now, it’s a bit more personal.

H2: Is there a scenario around the solar panel supplying a certain number of households?

Facilitator 1: In this case it’s you four.

H2: Four, four of us OK.

Facilitator 1: Yeah, for you four.

H2: Coordination between four is feasible, I was thinking of – yeah, I think it would still need a bit of a shift wouldn’t it.

H10: It is a good point though because it makes a difference doesn’t it if it’s four households, or five, or six, or seven, it starts to get more and more complicated.

H2: Yeah, exactly, I was assuming it might be bigger numbers but yeah.

Facilitator 3: And how many people do you each have, is it you all just yourself in the household unless you’ve got visitors, or are there other people in the house?

H2: No, my son and myself.

H9: There’s two of us.

Facilitator 3: Do you think that would make – does that add another level of complication or not necessarily?

H9: It wouldn’t really for me no because Will’s out all day, I’m home all day, I’m the runner of the home, so it’s really my call how it works.

Facilitator 3: You’ve got the responsibility.

H9: Yeah.

Facilitator 2: That is an interesting – sorry go on.

H8: I was going to say one thing – I’ve said it before, I’d like to get a heat pump and probably our next car will probably be electric, and if I was in a shared solar scheme, I’m certainly mad about because it’s the right thing to do, but at the same time I’m probably taking advantage of the communal solar, that would be an issue potentially.

Facilitator 1: So would you have to ask everybody to feel like, or would you –

H8: Do you mind if I get a heat pump and charge my electric up.

Facilitator 1: There are also some other devices that are – another scenario of communication of coordination that you leave it all to your devices, so you imagine that your washing machine communicates with your washing machine, and you have some kind of application, or you have set some parameters that said I want to do my washing, my laundry before six let’s say, and then the devices are the ones that talk between them and figure out when is the optimal time to do that. But that doesn’t include at all your – or it includes very little of your coordination, but it also means that your devices are smart, and that they have some agency over your life, and your activities, how do you feel about that?

H9: That sounds much better to me.

Facilitator 1: Really?

H9: Yeah.

Facilitator 1: Why?

H9: Because I could see it getting tense around people coordinating it, whereas I think if you all agree to it at the beginning that you’re going to allow these smart machines to do it for you, you’ve already agreed to the idea of the machines doing it, so that to me would seem less potentially difficult and fractious.

H10: I kind of agree, I kind of quite like the idea, and just so if we’re just a bit focused on washing machines because that appears to be the most flexible activity, it’s not just the washing, you are also then thinking about you need to be there to take the stuff out, and put it out to dry, and that you’re also factoring that in, you don’t just want a soggy mass sitting in there overnight or something, so you might think oh it’s going to be nice and sunny this morning, I’ll get it out in the garden, there’s just a bit more to washing than literally the machine. Or you might just not want the noise if something else that’s happening in the next room or something, I don’t know.

Facilitator 1: So you would be wanting some more parameters, flexibility?

H10: A servant to hang out the washing, what can you offer?

Facilitator 1: A robot to do it for you or something.

H10: A robot.

H2: It is true what you’re saying Helen, I mean often I do washing when I know the weather is good because I can hang out the clothes, that’s what I prefer to do, so yeah, for me that would be important actually –

H10: Yeah, you do think of that.

H2: Yeah definitely, yeah, I know that lots of people don’t, that’s not how they work.

H10: Yeah, or like in the wintertime, you do it in the morning so you can put it on the radiators during the day, you don’t want it last thing at night so it’s on cold turned off radiators.

H2: Yeah, just get some benefit of putting it out during the day, yeah.

Facilitator 1: So you wouldn’t be too much fans of – you neither, the devices deciding these things, of the device communicating with each other.

H2: I’m not sure actually, I’m sorry I need some time to think about it, I don’t have – yeah, mainly for the reason I just said, mainly I wash where it’s a day where things are likely to dry quickly, so yeah.

H8: I would like that, happy to submit to the robot overload, but yeah, if I could just close the dishwasher and I knew it was going to run at the best time, load the washing machine and press on automatic, the same with the electric car, I like the stuff that would be – that’s just the way it’s going to go.

H10: Would you leave the stuff to tumble dry for example, the clothes washing, laundry –

H8: Yeah, because the washing it would just sit and get smelly while you’re probably at work, yeah that would be – because some things probably like washing are a little harder to coordinate.

H10: Yeah, because like washing – what do you call it –

Facilitator 1: Dishwasher?

H10: Dishwasher, dishwasher yeah, that’s a bit more flexible isn’t it, if you’ve got enough cups to get you through until it’s done whereas it’s the clothes sitting in the washing machine, or not getting dry, and I stopped using a tumble drier a few years ago, so that doesn’t feel like a good option.

Facilitator 1: OK.

Facilitator 2: Just if we go and move on from that bit, I was just going to ask in a sense, on a final thing on that coordination mechanism, so let’s just hypothetically say that we were now setting you the challenge and saying, right you’re going to go home after this, and we want you just quickly to come up with the way in which you would go away and coordinate. So let’s say that you were going home and you were finding yourself in this situation of having the shared solar panel that you had to make the best use of, and we’ve talked about quite a few different options there, around how you could coordinate between you, and obviously you can’t do the smart appliances thing that easily, of all the other things what do you think you would realistically end up doing. Like what would you choose to do, what do you think would work best for you, anyone individually might be able to share, or feel free to discuss between yourselves?

H8: Like I said, if the four of us got together and said let’s buy some solar panels and share the energy, I guess we’d probably manage to figure out how much – if I’m in a household of four, and everyone else has smaller households, then I can probably – we have to know our [consumption], or try to moderate our usage so it’s a bit of a fairer sharing I suppose, that would be one thing.

H10: Or you could have let’s say, if you’re a household of four, chip in a bit more than a household of one, just because you’re likely to use more, and I think that idea – I can’t remember who said it, of just test it, let it run for a bit, to just see how it works out, by common sense, it could be that you don’t need to do as much as you think you do, that when you see the pattern after a couple of weeks you kind of start to modify your behaviour by common sense, it might be a bit optimistic.

H8: That’s a good point, if there was X amount of kilowatts, and we all knew our consumption we could pay and afford to do that, that would set an even – level out the playing field, so we could add to that.

H10: Or just the thing to do with planning who’s doing what at which time of day, rather than all sitting down and having a three hour booking everything in, you could maybe just let it run for a couple of weeks and have a look at it and see how well did we do. And then, do you know what I mean, modify in a gentler way.

Facilitator 3: And when you say have a look at it, what is it that you would want to have a look at to know how well you were doing, have you got a sense of –

H10: Like the thing with the little cardboard blocks, I don’t know.

Facilitator 3: Well, it could be a – just a numerical comparison between – it could be about how much money you spend; it could be about how much energy you send back to the grid, it could be as you say, a visualisation –

H10: I see what you mean, I was thinking like this in relation to this is what was available each hour, and this is where we overshot it each hour, so not singling out individual households and going this one used this much, this one – I think that’s getting a bit personal, it’s just collectively we’ve agreed to do it collectively, and you see that at 10 o’clock we were within the solar panel production, but then at eight in the evening we overshot it, and if we see that over a few weeks we’d start to learn we need to pull that forward, does that make sense?

H9: It’s like gathering a lot of information and sharing it a lot, and just by doing that your behaviour hopefully would start to alter it anyway, like I keep saying, got to use it at three or whatever, eventually someone would start to do it without it needing to be like booking in slots.

H2: Yeah, it will just shape to the production, yeah.

Facilitator 1: So in that scenario you wouldn’t have colours here right, you would just see the collective –

H10: The collective, the collective use hour by hour, that’s just a suggestion.

Facilitator 1: I have a question here now; can you imagine coordinating with your real neighbours?

H9: No, not a chance.

H2: Yeah, I think so.

Facilitator 1: Do you know them; do you have a –

H2: Yeah, reasonably, yeah reasonably, it would take a bit – obviously, it would take a bit of organisation, yeah.

Facilitator 2: That’s a good question though because it’s potentially different with three other people who you’ve never seen before and might not see again compared to people you run into on the stairs, or the driveway every day, what does everyone else think?

H10: I think you’re right, I think it is very different, I think – and like you were saying, it’s kind of what – your home is more personal than your car, and I completely agree, you don’t tell everybody when you’re having a shower, it’s how you live your life, it’s almost how you get on with your neighbours is by just keeping a certain slight distance, and it’s just in order to maintain that sort of nice neighbourly thing. So I’m sure we could do it because our street has an email group for everybody lending things, and borrowing things, so it’s a very, very friendly organised street from that point of view, you never need to buy a Swiss roll tin, someone will lend you a Swiss roll tin, it’s like that, but it’s more personal, so it’s not quite the same as the hypothetical.

Facilitator 1: So in this email group can you imagine if there was a signalling from the example of coordination we had before, I understand that if it was just a signalling of how much electricity is available now that is renewable, perhaps that’s OK, but you wouldn’t want to show what activities you’re actually doing, and how much you’re generating yourself, would you be OK by showing how much you’re consuming – not what kind of activities you’re doing, but how much you’re consuming?

H2: Wouldn’t you have to if you had that kind of shared arrangement it would be implicit that we – oh it wouldn’t have to be individualised?

Facilitator 1: No, and it didn’t have to be live also, like it’s one thing to know live – how much are you spending right now, and it’s another thing to see it collect like for the past two weeks ago what happened right, it’s not so close.

H10: So you just mean, for example, my household has used 30 kilowatts today, and the group gets to know Helen used 30 kilowatts on Tuesday, or whatever it is, just at that level, not if I had the toaster on.

Facilitator 1: Exactly.

Facilitator 2: Would that be OK because previously there you are literally – that you’d have the information on the generation of course at the group level, but then the consumption data would all be effectively kind of grouped, like everyone would be lumped together, so you couldn’t see any individual’s consumption within it, you could just see that that was the amount being used overall by the group.

H10: Yeah, like collectively we used 100 kilowatts rather than which household used how much.

Facilitator 2: Maybe broken up by household, and I kind of inferred that that was something that was more acceptable to you, that you would find that grouping of it together, so that no individual person, or household’s consumption was obvious.

H10: Yeah, no exactly, that was what I was saying yes – and were you saying – and how would you feel if it wasn’t grouped together, if it was individual. Now you see, I feel fine because there’s only me, and I don’t do much exercise, that was thrilling because there was another person staying for a few days, whereas I don’t know, maybe in a bigger household where you have less control over your other household members, I don’t know how you might feel a bit kind of – I don’t know. You’ve got the biggest household, are there rogue elements within your house who might just leave the lights on?

H8: Oh yeah, it’s a bit like not turning lights off, it’s that sort of thing, I think people would obviously want to know I think, whatever the consumption is if it was a shared asset – I think that would probably be, I think most people would want to get a sense of that anyway, and I think that’s why you would need maybe to figure out what the contributions are, I mean you could have it in a group of six guys that are hard core gamers running a lot of gaming rigs night and day, and you’d probably feel a little bit hard done by it if they were consuming all the electricity I think, that’s just an example, but I think to a certain degree.

Facilitator 1: So you would feel comfortable in sharing that information?

H8: I’d feel comfortable yeah sharing how much I’m consuming, but not say like to your point, what I’m doing when.

Facilitator 1: Yeah OK.

Facilitator 2: So just really to pick up – so you’re saying like in some ways it would be kind of interesting to know if there were some people using a lot like, if there were specific households using a load because then you could see that they were using a lot of the resource, so it wouldn’t in some ways be good enough if you could only see the accumulated amount of everyone because then you wouldn’t be able to get that insight into –

H8: I think human nature you just want to know if it’s fair, if we’ve all put 25 percent of our share to this kind of thing, is it fair if someone consuming 60 percent of it, like to know. And it’s obviously that kind of thing as well like, oh shall I get a heat pump, is that going to make things awkward for the neighbours and all that kind of stuff, yeah everything is going to get electrified eventually, so it’s a tricky one – maybe just the way –

H10: Would it be – so suppose in the half hour from nine to nine thirty, if people on the games consoles use up all the solar power between nine and nine thirty, and then you in the same slot want to boil your kettle, why would it be you that pays more, wouldn’t you all collectively pay more because you’ve collectively gone over, does that make sense.

Facilitator 1: Yeah, but that’s how it would be, you would share the resource of the solar, and the extra –

H10: Right, so everybody would pay a little bit extra, not just you because the gamers got in there first with their evil gaming consoles.

Facilitator 2: Just quickly there, when you raised the neighbour point, I think you immediately said like, no way.

H9: Well, I mean we only have two neighbours, it’s very easy, I know for sure that neither of them would do it.

Facilitator 1: Because they’re not interested in environmental sustainability, or because of the relationship?

H9: Not in the slightest, not in the slightest, they think I’m bonkers that I’ve got an electric car, why would you do such a thing, a waste of money, so it was a very – just one of those.

Facilitator 2: OK, so hypothetically speaking, let’s say that this shared solar panel was just installed by some external community organisation, and you were getting access to it along with – I don’t know, five other households including those, and they were just ignoring it, I mean do you think it could be a source of tension if they were just like using it whenever they wanted, and didn’t coordinate?

H9: I mean yeah, it’s just part of living with neighbours in the city I think, like they don’t do any recycling, that’s annoying but it’s just the way it is, in the city people are different.

Facilitator 2: The recycling wouldn’t affect you directly, whereas they’re –

H9: Yeah, it wouldn’t annoy me any more than the recycling.

Facilitator 2: OK, it’s just interesting because in some ways by doing – if this sort of things happens more it is introducing a recognisable, but like new dynamic into neighbourhoods, like and if suddenly someone’s behaviour that previously was just kind of annoying but hurting them, suddenly it’s like oh actually you’re just using up all of the solar panel and that’s annoying.

Facilitator 1: I don’t remember, did you answer about your neighbours?

H8: So I’m a year on the street now, I don’t know, I’ve got one neighbour who’s a bit of a recluse, I rarely see him, quite nocturnal, and then other neighbours are families, but yeah I think they’d be up for it, I mean as long as the households are similar sizes I think it would be fine. I might even do it – very hard to get hold of.

Facilitator 1: OK, so the having the equal sizes so you feel it would be equally shared – it would be more fair because it would be similar consumption, yeah OK, and you know each other so you think it would be more casual?

H8: Yeah, definitely yeah.

H9: You could do it where you would have like on virtual neighbours, like where you have people who are very similar to you, that you group together in groups in some way, so they’re not literally –

Facilitator 1: Next to – the technology I don’t knew, our energy expert is on that corner.

Facilitator 2: No, I mean it’s a really good thought actually because I mean without going into details of it yeah, that kind of curating groups of people whose activity patterns might be complimentary somehow, is quite an interesting way of looking at it, like doing it in a somehow kind of intentional way. The only difficulty is that some of this stuff it’s important where on the grid you’re located, like you might need to be generating and consuming on the same part of the electricity grid for there to be certain benefits, and then you might not have that much freedom to pick and choose who you’re with, for some reasons that sort of curation is actually quite an interesting thing that’s talked about, but not really been seriously explored as far as I know.

H10: And how would you, if you collectively – four households we decided to buy solar panels, how would you know how many to buy, like suppose we kept running out, why wouldn’t we buy one more or something, are they very expensive.

Facilitator 1: I would say keep that thought because now we’re going to introduce a battery, so I think it would be an interesting kind of scenario what you’re describing here, but I’m going to show you a scenario so I’m going to sit there. So now we have been playing with the assumption that whatever gets consumed, whatever gets produced we have to consume immediately because otherwise it gets lost – well not lost, it goes back to the grid right, and there’s not much earning from that. But now we will introduce the scenario where – you have – this is basically your visualisation; this is the March data.

You can see it’s the same pattern as the one underneath, and this is before you shifted your activities to be all together, so the colours are the same, this is like the bread making, this is the other oven, and here we have a simulation of what a battery might look like, what would happen in this case. And what you have here is like this is how much this is the use, this is how much solar energy has been generated, and how much has been used, and how much has been left unused, so the grey, which is here is this grey. And everything that has been consumed by the grid is this black, so you have let’s say here 5.2 pounds that you have saved, by using directly and then you have paid £8 from the grid.

But if you have started to put a battery, then basically what happens is that you save some of this energy here that you haven’t used, and that would allow you not necessarily to have to shift so much your activities earlier in the day. In this case you would need quite a large battery to minimise it as much, so you actually – so this is more or less a maximum size of the battery let’s say, so you would still not manage to save anything, but you would still manage to, to not need to shift so much activities, what do you think about that?

H9: Well, it makes it a lot easier, you don’t have to do anything like as much negotiation if you’ve got a broader sweep of time when you can do something.

H2: Yeah, there’s more flexibility obviously.

Facilitator 1: I mean let me give some context, this battery is huge.

H9: How big?

Facilitator 1: How much money are we talking about here?

Facilitator 2: I mean a battery of that size would be like many – probably multiple tens of thousands I should think, like a sort of a smaller battery in the order of a quarter of that, I think yeah, you’d be talking – well maybe not multiple tens of thousands, maybe like up at 10, 15, 20 thousand.

H10: How does that compare to a car battery, what size is a car battery?

Facilitator 2: I mean, do you mean an electric car or a standard car battery?

H10: Electric, yeah electric car?

Facilitator 2: I mean it’s going to be similar in size to an electric car battery which is apparently why they’re so expensive, so when you’re up to that sort of 15, 20 grand mark a lot of that cost would be on the battery.

Facilitator 1: So from one hand it would need a lot of investment, initial investment to get a battery like that, on the other hand you’re saying it gives you some more flexibility right? What do you think?

H2: Yes, it’s an additional cost isn’t it, yeah but it does give – definitely it is more flexible.

Facilitator 1: Would you prefer to coordinate, or to have flexibility let’s say if you have –

H8: I suppose it depends what the payback is on the battery, if it’s going to take 30 years to pay back the battery, then maybe not so much, but I think coordination – I think coordination as much as possible, but I think when it comes to people starting to get electric cars then the batteries are going to have to be – it’s really how the battery is going to be worth it.

Facilitator 1: Community battery, or like this kind of battery, solar batteries.

Facilitator 3: Do you think you’d lose anything by having a battery and substituting the coordination and the battery?

H9: No, I’m just thinking I suppose it might make you a bit complacent and not bother to learn quite so much if it was easier.

Facilitator 3: That’s true.

H9: If it’s easier you don’t need to learn.

H2: You might not focus quite so much in a way.

H9: Yeah.

H10: I think if we just collectively chipped in 20 grand, or whatever it is to buy this battery I think we’d be very focused, I think it’s like you say, you’d never get it back within your lifetime, it would be cheaper to just keep buying it off the grid wouldn’t it, so it – I think a lot of these environmental things you have to think about intergenerational justice rather than me saving cash now, it’s never going to pay back is it. So we’re either going to put in – I don’t know, I’m just saying 20 thousand – it’s a serious financial commitment.

H8: It would seem to make sense to charge your car during the day when the sun is out, and then use the car as a battery at night, but again it’s –

H2: I don’t think it’s possible.

Facilitator 1: We had another workshop with another participant with an electric car and apparently he cannot use it with solar.

H8: It’s not a two way street at the moment.

H10: What was he going to try and take it in the house and cook on it?

Facilitator 1: No, there was a question, there was a similar idea.

Facilitator 2: But that is definitely a thing which is wanted to be done, linking the vehicle to grid, so I mean it’s not implausible.

H8: But if that’s coming down the road it does seem like investing 20 grand in a battery would be really good, I do think yeah, probably focusing on this the first step would be seeing how it goes and then maybe the battery second.

Facilitator 1: You are planning to – but you are not planning to buy a battery?

H8: I am, yeah we are going to buy a battery, a smaller one but yeah, but not a massive one, yeah – mainly because we’re looking to getting a heat pump as well – it was interesting, when you did the application on solar they ask you do you plan to do this, do you plan to do that, have you got this, have you got that, so you sort of type it in and then it kind of recommends the configuration for the battery. If you had a battery you could save a lot of money, especially if you’re using it for [heating].

H10: That’s interesting.

Facilitator 2: With electricity prices as they are now, which has effectively doubled within the last year or something like that, it just – the more of your own generation that you can use, the saving – well the payback time is halved because the electricity price has doubled.

H10: But how does it compare buying more solar panels as against buying a battery, assuming you’ve got a lot of roof space, wouldn’t it be cheaper to buy more solar panels, or is it cheaper to buy a battery and have fewer solar panels?

Facilitator 2: Very briefly, it’s really you want to get it – just we were talking about just right downstairs, you want to get it just right because basically like in some ways it’s cheaper to get more solar panels because even though solar panels are expensive, a lot of the cost is in the installation, so when someone’s up on the roof with the scaffolding you want to get more, but if you’re just going to generate much more than you need, and exploit it to the grid at a very low sale price, then you’ll pay quite a lot more for your installation, and you’ll take longer to pay it back. So really you want to dial it in as well as you can at the right amount, otherwise you end up investing more than you could ever pay back.

H10: This is like you’re saying about just optimising the balance of panels and people.

Facilitator 1: You were also, sorry.

H8: No go ahead.

Facilitator 1: No, no.

H8: This must be – you mentioned like putting solar panels on a building for example, and then being able to have your existing utility provider, but also the community panels, who would administer that scheme, like how would they work with the existing utility provider to get our new bill or whatever, to funnel energy to your house?

Facilitator 2: Yeah, it’s still not straightforward as to how that would be done, I mean these are things which would be – have to be regulated for exactly how that would be done, I mean it’s not –

H8: So it’s not something that exists right now, it isn’t a scenario?

Facilitator 2: If it exists, it exists in the trial stage with maybe people being given slight kind of divergence from the regulation to be able to do it, but there’s basically different parties involved in the electricity industry who would be involved in overseeing that – getting your meter data, and retrospectively assigning a certain amount of its consumption to one supplier, and a certain amount to another, but yeah, it’s not straightforward, and that’s one of the reasons why it’s not happening at the moment.

H8: I did come across a company called Octopus – I think they do something like that, I don’t know – but it’s the –

H9: We’re on their waiting list for their next project.

H8: So am I actually, yeah.

H9: It’s sort of crowdfunding individual wind turbines that they slot into places that were farms, or there’s enough space for a farm in Wales, and then they – and the deal with Octopus where they reduce your electricity bill because you’ve upfronted the cost of this.

H8: You’re buying shares in the wind farms.

H10: OK, interesting.

Facilitator 2: Yeah, and like you say, they do it through partnerships which is completely – it makes sense, maybe that’s how this sort of thing would happen first. In fact that’s how the [Charity Name] study – [Charity Name] are doing one of many studies similar in nature to this, and I think that’s in partnership with Octopus isn’t it, the local energy project.

Facilitator 3: I think so yeah, I’m not involved in that, but yeah.

[Redacted dialogue relating to partner charity]

H10: I mean I’d like there to be more – more local solar panels – more in this area.

Facilitator 4: Yeah, and we’re definitely growing in building more project investment, it’s a good time to do that, a good time to invest.

Facilitator 1: OK well if there is no more questions I would like to do some debriefing, like to talk a little bit about the process of how you felt, how you experienced both the annotation stage, like when you were monitoring your energy consumption, but also about the workshop and [visualisation] itself. So maybe going in turns, and it might be you agree with each other but that’s OK, maybe tell me three things that you liked, and three things that can be improved from both the energy monitoring, like the visualisations we gave you, the whole bit, as well as this workshop setup today with this visualisation – you can start.

H8: So yeah, I’d love to see this go out in the industry because that was really cool, the annotations were relatively easy to do, sometimes the going back and forth was a little bit clunky, that’s more just for you I think, but generally I found it really easy to do, and really quite interesting as well to see – I’m doing this now, this is well yeah, all right we run a dishwasher it takes four hours, that was interesting. Just made me more acutely aware of how we’re using energy I suppose it was kind of what I want in my smart meter, or I thought my smart meter was going to do which has been a bit of a disappointment, this was actually much better along the lines of where like a good – a proper set of energy management tools would look like.

Facilitator 1: Wasn’t it like – why did your smart meter disappoint you, what does it show you?

H8: It just shows me just very historically what you consume, it will give you what you’re doing now, but not what you’re consuming, it just doesn’t give you much granularity in the detail, just tells you what you’re spending.

Facilitator 1: But it’s also on half an hour right?

H8: Is it, I don’t know, actually it will tell you, so if I turn the kettle on I can see it go to 3K, so it’s pretty immediate on that side, it’s more I think just looking at things historically, and that’s where you start to learn a bit about how you consume stuff.

Facilitator 2: Just quickly, it would depend on your supplier, so some – basically normally you have to opt in to give your supplier half hourly data, if you’ve got a smart meter, and if you’ve got the supplier like Octopus, who you mentioned, you can then get your – you can see what your half hourly pattern is because they provide that as a facility on their website, but I don’t think all suppliers would necessarily do that. So it might be that you can investigate that and find it out, but it will depend a bit on the supplier.

H8: It was interesting, I remember they did a trial where there was excess clean energy they would actually pay you to consume or something, it wasn’t huge amounts, it was like an hour or two, I think it was very successful.

Facilitator 1: And did you learn something new about yourself or how solar energy works in general?

H8: Yeah, it was interesting to see the growth of the energy, and also where we got into like lazy habits of just putting the dishwasher on right after – just so you have clean dishes in the morning kind of thing, it definitely made me think if we had solar panels we’d shift stuff around.

Facilitator 1: How about you?

H2: Yeah, I mean a lot of my thoughts are very similar to yours, yeah I suppose it will also make me more conscious in terms of the actual production – the maximum production times. I mean I suppose this is very brief, maybe not so important, but I did wonder about maybe just a more sensitive graph around the production, around particular use of a particular – say kettles, or washing machines, it didn’t seem – I was surprised, I was expecting a big peak with an oven, or a big peak with the washing machine, and it didn’t seem to reflect that, so that’s my only thought.

Facilitator 1: So you were expecting to see a bigger spike?

H2: Maybe just a more sensitive graph of the different items I was using I suppose, yeah, I don’t think I have anything else more – it was easy to use, and it’s been really interesting to hear the discussion today, I’m not familiar with – I don’t know a huge amount of – I think you all seem to know a lot more, but yeah, so it’s been really interesting. And also to really think out how it would work in the practical situation, the actual realities of it, yeah, interesting.

Facilitator 1: Helen?

H10: Yeah, I found it very interesting, you know you said do it once a day, obviously, I’m on there every half an hour just to see what I’ve – it is very interesting, you have no idea of the relative amount of usage stuff, it was interesting to see. I don’t – I’ve always felt there’s not a lot I can change with regard to electricity, I literally put the amount of water in the kettle I need and stuff like that, you know so it’s interesting. And I just kind of find the whole thing very heartening to know that people are trying to do something about it because you feel very on your own when you know that you have lovely neighbours, but they do not give a shit, just all they’re interested in is if they’ve increased the value of their property, that is the only thought. They are people who are on different places, so it’s just to get together with people who care, but I want to know that people are researching how are we actually going to make it happen, it’s just really good to know.

H9: Me – yeah I enjoyed doing the – I was looking for out for it as well, I hoped that it would calm down if I had it full on, but it was a strangely competitive thing, but I couldn’t quite figure out what the game was. And I was really surprised at my usage, and I could see that if I got solar panels I would really get into changing how I use things, and I thought it was very interesting too that, I found it very easy to notate like I could see yeah, put on the dishwasher then, but I couldn’t figure out for ages, like there were some I thought I don’t understand because I know I did – and it was the things that were on timers, and they wouldn’t register, like I just – it took me so long to figure out what they were because it makes you so passive or something, the fact that they’re just going to come on and go off all the time.

Facilitator 1: Like what?

H9: The boiler coming on to heat water, those kind of things, so I thought that was interesting. And it’s the first time I’ve figured out why anyone would want their dishwasher worked off their phone, I remember when we got our dishwasher and there was – you know, you can set it up as an app on your phone, I thought that was completely ridiculous, why on earth would you ever want that, and I couldn’t understand why. I thought that’s really good, I really liked the physicality of the blocks, it was a good idea.

Facilitator 1: Can I ask why?

H9: For me it really – that taps into the way my brain works, it’s much more physical moving and shifting things around, if that was just all flat and graphs I wouldn’t find that anything that was interesting.

Facilitator 1: OK, you mentioned that you saw it as a competition, as a game?

H9: When I started looking all the time, there was something about – it’s just something about my personality – I knew other people were doing it too, and we were all going to meet up at some point, it just brought out something competitive in me, like would my graph usage be very high, or very low, or very – all of those kind of feelings, it brought up in me.

Facilitator 1: And how do the feelings are in this case?

H9: Well I did feel I had to explain the oven usage, I couldn’t just let it sit there.

Facilitator 1: That would be the reality of the coordination right.

H9: Yeah, in a way it is isn’t it, it would be similar where you’d have to say well actually we do this, don’t judge us.

Facilitator 2: Make some bread.

Facilitator 1: OK, and you also said about the physicality you mentioned that would be the next question I have, we showed you, you used various kind of data presentations, you have the annotation system, you use a phone which is digital with your computer, you have a physical version of your data, there’s another screen based annotation – not annotation, a visualisation system, how do these compare for you, how did they help you understand your electricity consumption and data in general?

H8: I love this to see live data and sliders and different scenarios, so it’s definitely my cup of tea. It’s interesting, this is great, as a workshop setting where we’re sitting it’s perfect, but yeah as a dashboard I guess those – something like that would be quite interesting, especially collectively decide on managing the panels, that would be interesting.

H2: Sorry, can you remind me of the question, sorry.

Facilitator 1: Yeah, no problem, I’m just saying that we have like – we showed you, we gave you three different types of visualisations to work with, the one you had at home with the annotations, the physical version of the data, another kind of dashboard more interactive visualisation here, and the question is how do you feel about this data presentations, and how do you compare them?

H2: Yeah, I mean for me the dashboard I think it’s really interesting, I will have [unintelligible 01:30:12] at home, I just relate to it more.

Facilitator 1: Why – sorry, I have to ask this?

H2: I just think it’s more defined I think, it’s more obvious the usage, it’s more concrete I think yeah, because it was all just all the same on the what we were recording at home, obviously it was just all one colour block wasn’t it, it didn’t stand out as strongly for me.

Facilitator 1: OK, and do you feel like you learned something – I already asked you that.

H9: I think what’s interesting is with the thing like the sliders and this is that you can play with it, and go over – change the scenario, whereas the others is just looking at the information, and it’s not – it is more interesting just to play around, even though maybe go to a silly point where you go and max it out completely and see what that would be, and then bring it back to something more sensible. You can play around and learn from that by just playing around with it more, interacting.

H10: I found the – even though it was all grey coloured on the thing, the peaks for me that was just as interesting as if it had been coloured, it’s like the thing that’s different from your baseline activity, that was the thing that’s interesting, I even experimented once with boiling my water in a cup in the microwave, just to see if it’s different to the kettle and I can let you all know, no it’s no different, and it makes a shit cup of tea, you don’t need to do that, so kind of makes you – I found that made you aware. And this again, I love it for a hypothetical thing, but the exact weakness is the thing about you do not know when the sun is going to come out in the UK, so it’s the sort of hypothetical exercise to get you thinking about what’s like a typical day, but how would you plan when you don’t know, that’s the thing that you wouldn’t know how to do, unless we can – like machine learning, we can be human machine learning, and kind of learn the patterns, which I kind of did.

Facilitator 1: That’s what you suggested as a coordination system, right this is what I take as a takeaway from here that the system that you would prefer it seems would be one where you see it, live through it and adjust your patterns slowly.

Facilitator 2: Sorry, just to follow on to [previous speaker name] – obviously, the forecasting of the sun is possible but not necessarily that accurate, and they’re working on something called Nowcasting, which is like real short-term forecasting of the sun in your area so that you’d be able to see – it would like know there’s a cloud coming over and let you know in half an hour it’s going to go over. So a) the first bit is like I would assume that would be interesting to help you plan, but the other thing – just be interesting to get your thoughts on this, where there’s lots of work is on forecasting what consumption patterns might be. So it might be as you – using machine learning, looking at all your consumption patterns together, and then coming up with predictions of when you might ordinarily be expected to do stuff.

H10: Yes, interesting.

Facilitator 2: I think some people can sometimes have mixed views on that because of its seeming usefulness, but also the way in which it makes you feel like you’re so easily predictable.

H10: You could get your washing in couldn’t you if you knew a cloud was coming.

Facilitator 2: Anyway, just to hear if there were any reactions to that, sorry.

Facilitator 1: Well, from our side if there’s no other questions, I mean now is the time for you to ask questions to us actually if you want to know something about the research, or if there is something else you want to bring as comments or anything.

H10: Can I just take a photo of the thing.

Facilitator 1: Of course.

H10: My colleague –

H9: I think some of it is too – you have to – it’s a bit of a leap of faith, you have to be into it as an idea and then you just have to jump and learn as you go, you won’t be able to have it all in advance, all the knowledge, and all the information, and it will probably all change a bit anyway, and technology will change, so some of it is that you just want to do this, and that you want to move in that direction, and then start learning.

Facilitator 1: Yes.

H9: You would say you can plan certain scenarios and how it might work, but in reality it will probably be a little bit different anyway.

Facilitator 1: There are some other similar coordination systems, there is a study from Denmark where they have an app, where they give people an app where they would say this is how much – this is how much your laundry would cost now, and then you would see how much it would be green or not green. They were trying to do something similar to what we’re discussing here, and they found for instance, that the people had – that’s why I asked you about the competitiveness and the gaming that the people saw it as a little bit competitively because they could see the consumption of the other houses in total, and that was – they saw it as a negative thing.

The houses were actually competing with each other on this, so there are attempts to go there, but your project I think is actually quite interesting because it’s slower, it’s not like an app coming and telling you this is how the immediate kind of consumption things right, I don’t know if I’m making myself clear.

H9: Maybe it’s a gentler way.

Facilitator 1: Yeah, exactly.

H8: If I wasn’t able to get solar panels on my house I would love to buy it for panels on top of my local primary school, and just replace that energy that I use with green energy from the school, if it’s bigger I guess, and get a better price for it. It just seems like such a good idea, I don’t know that doesn’t happen – the regulation, or I don’t know whatever, but that would definitely be a good way of – a nice simple way of doing it. This is great as well, but it does create maybe a bit more friction, or I’d be weary of – because as households are electrified again, I’d be weary of doing shared solar if I wanted to go down the road of electrification of my house because I’m going to be a big consumer of this, and that could be awkward.

Facilitator 1: OK, any other questions?

H10: I think there’s the concept as well about how much inconvenience are we prepared to take on compared to what we’ve known for all our lives up to this point, and so if I just give the example of glass milk bottles, so yeah, it’s a pain washing out glass milk bottles, it’s a pain, but some of us just go OK I can cope with it, I can do it. And it is just that as sort of as a principle so the thing about it’s a bit of a pain to shift when I do my washing, and you just have to test yourself perhaps thinking of future generations or something else, should I be expected to live the life I’ve led up until this point, or should I be expected to take on increasing levels of what I feel to be inconvenience, which really isn’t inconvenience, and it’s just different, and washing a milk bottle is a pain.

Facilitator 3: It’s interesting, there was some examples of the way we already shift our behaviour or so flexible, so the example for the washing machine and putting the washing – doing your washing when you know that it’s going to be sunny so that you can hang your washing outside, we wouldn’t necessarily think of that as inconvenient, or having to be flexible, but it’s very similar to some of the things we’ve been discussing here today.

H10: Yeah, no it is a flexibility isn’t it.

H2: But for me it is interesting really like drilling down into the practicalities of this kind of scenario because I mean there are practicalities that people will be resistant to, or will find it difficult, so yeah, I think it’s really interesting – obviously, what your study presumably is about trying to iron out that as much as possible and make it more accessible. Because I mean we’re all interested, but I mean we’re motivated, lots of people are going to be not so motivated, or maybe slightly motivated, so it’s going to be really important to make it look easier, or more accessible, yeah.

H8: So is the other aim of the research to figure out how the facilitate a more shared asset, or is it more attitudes towards it?

Facilitator 1: More of the attitudes towards it, we’re going to prototype, I mean from this we’re making a series of workshops that we actually understanding coordination ideas, we’re getting most design ideas, and we are going to make some kind of system prototype, some kind of system probably during the fall, or that’s at least the aim at least, and then see how that could actually potentially function in reality. But we’re not going to prototype the solar panel part of the system, but more the coordination part of the system, this is more of a – a little bit speculative still, in terms of policy, but it’s a very important thing that needs to be thought on for the future. So it’s a more interesting, shared project that we have, so we have people from anthropology, from energy, and I come from the human computer interaction side of things, so it’s a shared project with different kind of research questions depending on the perspective from which you see it from. That’s why our questions also came from different directions. OK so thank you very much.

H9: Thank you.

[End of recorded material at 01:40:45]