

Chas Warlow, HamHydro

Steve Jarvis, MD, HamHydro

Steve Naylor, Environmental Agency



Jono Adams, HamHydro

START OF TRANSCRIPT

Jono Adams: Right, good evening all, and thank you so much for coming along. Um, we're delighted that we've got a lot of you. Uh, I'm just going to take a couple of minutes before Steve gives his presentation to introduce the agenda for this evening, and to introduce some of the guys who have been involved in, in, the development of the scheme to date. So, first of all, my name is Jono Adams, um, and I've just very recently come on board to

volunteer to help support with the scheme, to do exactly what we're doing this evening- to really try to open up the discussions and communications to the most important people who are the local community related to the scheme. To, at the very start to help to understand what the scheme's about uh, the design, to answer any of your questions um, and then as we move into the various developments, stages of the developments, then to have you understand what opportunities that there are to get involved as we move through. But, we'll go through all of that after the presentation.

So, first of all, we're gonna have a . . . I'm just going to introduce the team, then Steve's gonna give a presentation for about sort of 20, 25 minutes, then we'll have some Q&A by the floor, and then. . . for about 15 minutes, and then the intention is really to, for the rest of the evening, to come and speak to us individually with our different areas of focus, and so you can ask as much more detailed questions.

Um, we will be; we're gonna be here 'til 9 o'clock we'll probably run another presentation at sort of about 7:45, but we'll know more about that later on.

So, first of all, the team: This is Steve, who's um, Managing Director for HamHydro, and he's going to be doing the presentation. Um, and Chas, who's been involved right from the very beginning. Uhm, and involved in the . . . and we've got Jean as well, and there at the back, and—who else we got—uh, and then Paul who is over there in the corner um, and he's on the technical side of things and supported by Brendan, who is, uh one of our consultants involved, ok? And we've got the Environment Agency coming along later on as well, as we've obviously been intimately involved in it all. I think we have everyone, is that right?

So, let me pass you onto Steve, um, if you could just hold questions until he's finished the presentation, and then I'll open up the floor, and we can take it from there.”

Steve Jarvis:

Thank you, thank you very much, um, for coming along, we're in the run up to Christmas, and, uh, we really value uh, your time, um, and I hope we can give you as much information as we can. If there's something that is NOT in this presentation, that you want to know, please um, come grab one of us, um, during the event, and we will try our best to answer that question, and assuage your concerns, but ultimately, the key thing we want to, to get a handle on is to is—this is a community scheme. This is not EDF coming to try to build a power station in your back garden. This is a *community* scheme, where the benefits, um of electricity generation will accrue through

your local community, and we want the community to be a part of it, as is possible, as is possible.

Um, we realise there're some folks here who feel they have not been kept in the loop, as much as they possibly can, but let's ignore that. We're starting from this point onwards, we are, we have an open door um we'll be running this and a series of other meetings, to answer as many, as many questions as possible and uh, to meet. . . to meet as many people as possible, and we really welcome, uh, all of your input. And so, I'll try to . . .

SO- HamHydro- why do it? Um, and I ask myself that, and my wife often asks why I'm doing this. And it backs this community thing. This is empowering the local community, and it's going to power the local community, this, what we aim to build will power 600 homes, it will uh, reduce carbon emissions by, uh, a thousand tons per year. So, from an otherwise wasted resource; that water is tumbling over the weir, and is wasted, if we don't, we don't harness it.

We want to complement and enhance the weir structure. That is an industrial structure, it's been there for um, a hundred or so years, and it's changed over time. What we want to do, is enhance, uh, and improve upon, improve on, on that structure. Critically we are adding to naught.

It's technically a robust and proven technology, um, you'll be able to have a chat with Brendan, and see his model. There are hydro schemes, um, working up and down the country. Not quite as big as this not on top of a structure on the river, but is a proven technology. Um, and it's financially viable, um, before I took over as, um, uh, Managing Director, I was the Finance Director. I'm also the Finance Director of a carbon consultancy and, and prior to that, I was an investor in The City, so this is a financially viable scheme, um, that requires stringent (something) to the net.

And finally, it is financially viable, and there will be a, a community dividend. What we're aiming to do is a community share issue, that will allow each and every one of you in the entire community to acquire a share in this and it will give to help to society, it's just like the normal kinda thing- one member one vote, um and will offer a return of between six and eleven per cent, uh to community members, in addition to that, ten per cent of our profits, or- the scheme's profits, will go to a *local* foundation, that'll help seed other projects like this, will help seed fuel poverty alleviating, alleviating problems in the local, um, area. And just to put a number on that, over its lifetime we think there should be something in the region of about

half a million pounds going into, what we call the HamHydro Foundation—it doesn't need to be called the HamHydro Foundation or the Ham and Teddington, uh, Foundation, it could be called the Teddington and Ham Foundation call it whatever you like it- it's the community foundation, um, so this is a community scheme at its heart.

So—where are we in the process? Um, I think we were already sort of saying that, we're in the final stages of planning, and there's a potential, uh, hearing in January, of 2014-- um, which we hope to be successful at, and then we're in the first stage of our community share offer. We'll be doing it in two stages- stage one- is a little bit risky, in that it's going to happen before uh, we have planning, or during the planning process. So, obviously, if we don't get planning there are risks involved there. Um, we're aiming to raise a hundred and fifty thousand pounds in that share issue, um, our prospectus is currently with the HMRC, uh, I've got copies here, but I can't let anyone take them away, because it's, uh, currently with HMRC, and on this first issue, the terms are slightly higher because the tax breaks are slightly higher. I don't want to spend too much time—if anyone's really interested, I will take some time, but I think it's mainly about learning about the scheme, rather than the sort of, business part of it.

And the second stage, and this is the bit which is sort of most exciting, is that once we're through planning, and the risks have dissipated, we want as many local shareholders as is possible. And so we need to raise, just under 5 million pounds. Um, and working out once planning has been secured, and there are attractive tax breaks, and we think the returns are gonna be around about eight and a half per cent for, for those investors. Uh, it's not particularly spectacular, but we think that is a fair financial return, and we think that it will be a community, a community-wide share scheme.

So, and it's going to be operational by mid to end 2005 (sic). The construction process, Chas? Three to six months—(Chas: "six months"). Ok, six months.

Okay, so- the key benefits: fair financial return, the profits stay here- in Ham, and Teddington, Richmond. It's not the big six that will benefit from the generation of electricity on Teddington Lock. It will be, it will be staying in the Ham community. Um and, one of the things that has really got me into this, is local action, against a very large, global um, issue of climate change. It's often felt to be far too big an issue. What can I do? *This* is what we can come together in the local community, we can build a hydro-electric

plant that will harness some energy that would otherwise be wasted, and we can reduce our carbon emissions. And if we can be a blueprint for other schemes up and down the country, collectively we can actually make a big difference.

So that's really what gets me, gets me going about this.

Um, it'll provide an educational resource. Jono Adams has just been into Teddington and Teddington School. They're keen to get involved in it and to help educate our young students about what can be done. When we talked about the [template] for the community.

I've painted the picture of this is all absolutely wonderful and of course we should do it, but there are some potential negatives here, as with any trade-off. We are going to put something there that wasn't there. We're going to change the shape of things, so there are obviously some frequently asked questions, and I've listed a few of them there. I will try and go through as many of them as I can, but what I want you guys to do is buttonhole each and every one of us. If I've not done a good enough job of explaining to you in this meeting and in subsequent meetings, get in touch with us and we will try to explain it and, if needs be, we will try to change what we're doing.

So, the visual impact. This is probably the biggest single issue, in my opinion. The first thing is that there's already an industrial and utilitarian structure there, so what we try and like to do is enhance the look and feel of it, actually turning from [unclear] water dynamics here and [unclear]. In my opinion, [unclear] people, but lots of people thought windmills and water mills would be useful. Back in the day, they were considered utterly monstrosities, whereas now they're useful. That's the Marmite question, love it or loathe it. I love it. Here's just a few views, and please bear with me.

So, this is the view from the bridge just by the Anglers. I'm sure that many of you are familiar with this view. That is where we're proposing to put it, and on the overhead Google Map shot there. If you had a zoom lens or a pair of binoculars from the Anglers Bridge, that is what it would look like. Now, we have made a modest change to our plans. We did various working groups and the roof was hated, so we've taken the roof off. So I'll ask you to use your imagination just on this photo, this montage containing the rooftop area. On subsequent ones, I'll show you it is there.

So, this is what one looks like up close and personal. This is the scheme at Romney Weir, so up by Windsor. So those turbines power the Queen, up at Windsor Castle. Now, this is about five to ten metres away from them. As you guys know, the stretch of water by where we're proposing to do it is not actually open to the public, unless you're a member of the Lensbury Private Members Club or, a little bit further down, you're in one of the river road homes. But even those river road homes are probably around about 750 metres to a kilometre away from it.

So now you're really up close and personal, but it's a good view of what they look like. That is the view from the Ham bank as it is now, and then:



that is what it will be like from that view. I think it looks quite good, but I'm biased. That is the view from the Ham bank, another side.

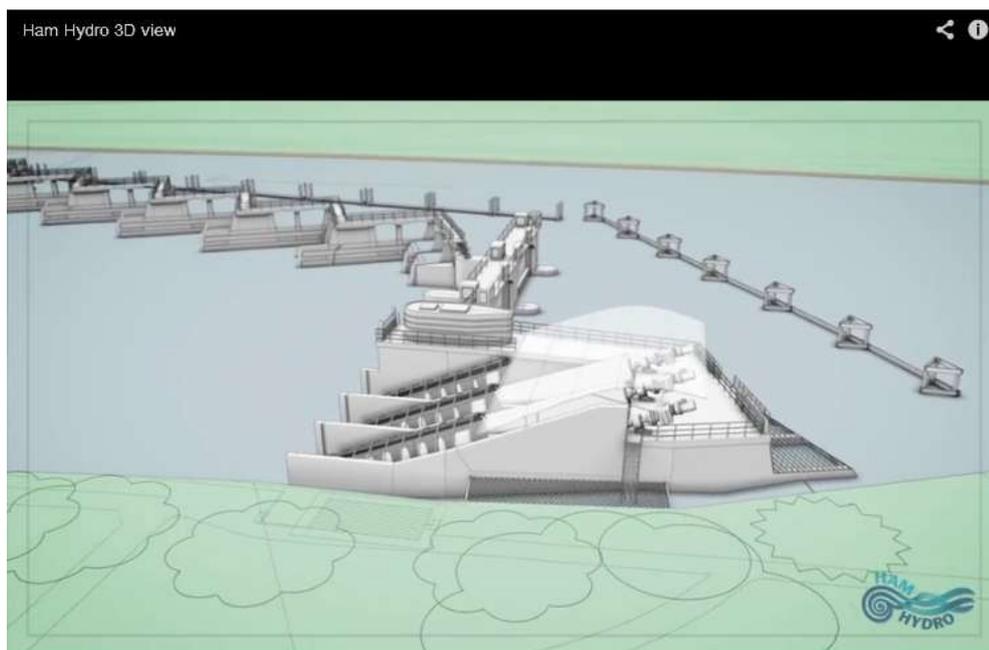
Again, this is a Marmite issue. I believe it's in keeping with the current structure.

This is the view from the Lensbury terrace [picture not available], so this is without the scheme.

Male: It's this here, is it?

Steve Jarvis: It's with it, yeah. No, that's it's shown. This is without it and this is with it, and just in case you didn't quite catch that, I'm going to put a red line around it so you can see where it is. Now, I don't want to be accused of bias, because I've shown some really quite fabulous pictures of our scheme and I think it looks brilliant. Up close and personal, so on this side, right

close to it, that's what it used to look like, and that's what one of our drawings looked like.



Now, the sharp intake of breath is justified. So what did we do? We took the roof off. Is there anything else we can do?

Female: Take it away.

Male: Take it away.

Male: Break it all up.

Female: Take it away completely.

Female: [Unclear].

Steve Jarvis: So that's back to - that's beautiful.

[Laughter]

Steve Jarvis: That's good, yeah. It's okay. So that is how - the reason I've taken the roof off, there are other things. There are other things that we can do, also. Those blue bars, we'd have to do a new [flooding system], but we could lower those down so, basically, you'd just have a flat structure. We could also...

Male: Sorry, I didn't get that. You say you can lower it down? What, lower the roof of the...?

Steve Jarvis: So where those blue things were...

Male: Yes.

Steve Jarvis: ...those things there, what we can do is we can lower down below the sight line. That will require us to do a new [unclear] risk assessment, and I'm not promising, but that is possible that is one of the things that is added today for you.

Male: How much lower, then, would the roof come down then, in that?

Steve Jarvis: It's not a roof anymore.

Jono Adams: It's not a roof.

Male: So you're talking about - we're taking what we're going to learn about that...

Male: No, but that [unclear] where the railings are, will that go down, as well?

Steve Jarvis: No, it has to be that height because it has to be set at a level of the 100 year flood risk plus climate change, and that's been set upon us by the EA. The Environment Agency demand that height. But we can get these houses and the generators lower, potentially. That's one of the reasons why we want to do a consultation to find out how important doing that is. One of the other things we can do is actually provide access, actually allow Lensbury Club members or the public access and actually look up there. They'll be thinking in terms of health and safety, et cetera, because those are [unclear]. That is very, very close. That is two or three metres away from it. That is a metre away from it, at the end of this house, and then...

Male: Quite an eyesore.

Male: Yeah.

Female: Hmmmm hmm.

Male: Leave it like that, then.

Male: [Unclear].

Steve Jarvis: So if we can work on the design to produce a design that is more favourable, we will.

Jono Adams: It's not the most beautiful structure as it stands, though, now.

[Over speaking]

Female: Yes, it is.

Male: Actually, it is.

Male: It is, it's quite Victorian.

Male: Yeah.

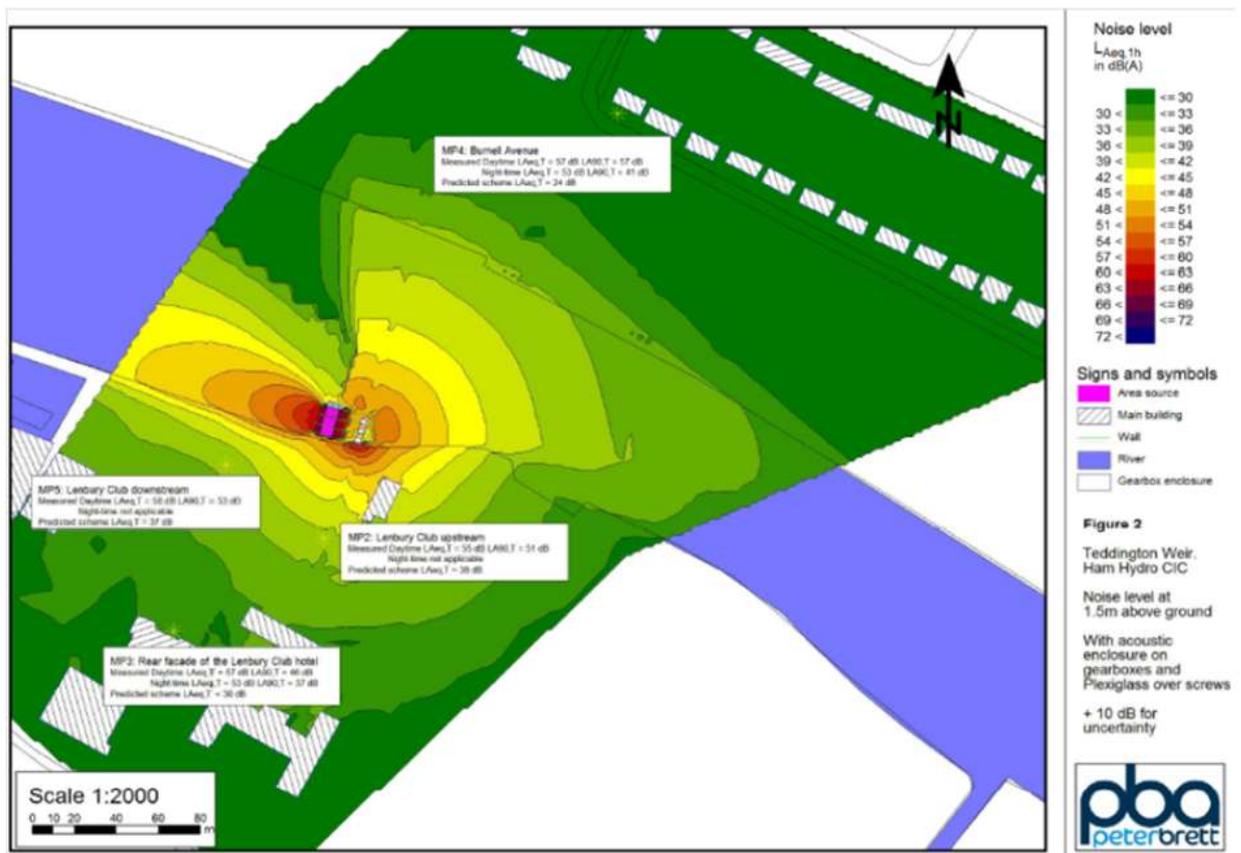
Male: Old [Duxford].

Female: Yeah.

Female: That's our heritage, isn't it, what we have? What with the old one [unclear].

Male: [Unclear].

Steve Jarvis: I'll come back to that. So, before I come to that, I'll look at the noise, because that's a very good, quick question, sir. So, we've commissioned various different noise surveys. We've had some very well paid people write reports for us, and they've produced lovely diagrams like this:



The pink bits are our generators, and they are noisy. Then it grades away to - and the green is about 30 decibels. So you can see it pretty quickly erodes away, and there are some of the names of the buildings. We've also added an extra ten decibels, but that still says within a very quick space of time, a very, very short distance, the noise levels have fallen.

Male: Is that without the roof?

Steve Jarvis: The roof is an ornament.

Male: I thought the roof was to keep the noise down.

Male: An acoustic shield.

Steve Jarvis: We're putting an acoustic shield directly over the generators and over the turbines, but the roof was our attempt at making some architecture, and then we found that nobody liked it, so we took the roof off.

Female: Where are the recognisable buildings and things in the town that [unclear]?

Steve Jarvis: So, this is the main Lensbury Club building, this is the sports centre and that is a temporary pavilion.

Female: Where's the bridge?

Jono Adams: The footbridge.

Steve Jarvis: The footbridge?

Jono Adams: The footbridge is downstream, further down.

Steve Jarvis: The north bank runs between the lower blue and the left one.

Male: Does it?

Steve Jarvis: Whereas the bank of the river is white.

Jono Adams: That's the bank of the river. So it runs through the middle of the town.

Steve Jarvis: This is the Ham bank here, so all the way along here. This is the river opposite blue, here. This is the Thames bank, and the footbridge is down here, out of the picture. I think it's in the - here is the Lensbury's [unclear].

Male: Yeah, that's by the sports centre.

Steve Jarvis: So further up here, you have Trowlock Island. What you've got here, this is the [unclear] Burnell Avenue. Here, you know Ham, that's where the line is.

Male: It all depends on the weir, doesn't it, to be fair? It's okay to do these diagrams. What we do know is that anything that hits the water travels much further, as people know when Lensbury has music playing, it travels at a vast distance once it hits the glass or hits the windows.

Steve Jarvis: Yeah.

Male: You haven't allowed for that. Have you bounced that off?

Steve Jarvis: No, we haven't. I guess what...

Male: You haven't, because it stops before it gets there.

Steve Jarvis: We're going to show you this. This is a complicated picture, it confuses me. Our sound guys are happy with it, so it says here that the ambient noise at that point is about 50 decibels an hour, so you can produce about 30 decibels, i.e. it won't be visible above ambient

Female: Can you tell us how much 30 decibels is for a non-physicist? Maybe other people here know what it is, but how loud is 30 decibels? Is it a whisper or is it the voice that I'm speaking now? Is it louder?

Steve Jarvis: I'm not going to make - going to come back to you on this. Can someone on the Ham Hydro team get on their mobile phone and say how loud is 30 decibels?

Female: Yeah, 'cause that's [unclear], 30 decibels means nothing to me at the moment.

Male: It's at least a double-decker bus going by, I reckon.

Steve Jarvis: That's a wonderful question.

Male: [Unclear].

Steve Jarvis: Thank you, sir.

Female: [Unclear].

Steve Jarvis: That's a good question and the next statement that comes to that is, how noisy is a weir?

Female: Yes. It's white sound.

Steve Jarvis: Is our scheme noisier than a weir? The answer is yes, if you're five metres away from it, no if you're more than five metres away from it.

Female: But it's the type of sound.

Female: It's a different type of noise.

Male: Water is a type of noise, isn't it? It's not the water, it's a generator. It's a mechanical noise and not a natural noise.

Steve Jarvis: So this is where we - I'm going to answer your questions, and I logged them. This is the sort of noise profile, and I'll try to keep it simple. Those diagrams were confusing for everyone. But what I wanted to say was that we have done our homework.

Male: What frequency is that at? Is that white noise? We have to have a bandwidth of noise.

Steve Jarvis: You have to look at the noise reports themselves to talk about the frequency.

Male: Sure, but lower frequency noise can be much more irritating than mid-frequency, and conversely, high frequency can be more irritating to some people.

Jono Adams: What I'll do is I'll send you a copy of our noise report. It goes through all of that in detail. But can we just get away from that technical side and just say, right...

Steve Jarvis: Can I just jump in to say, we will move on from those questions, but I think that we'll take and action away, is we will certainly look - a layman like myself who knows nothing about what decibels means, is to see whether we can actually put on our website a recording of what it would look like as compared to the weir, and you can get a feel for what is back noise or what is other noise. We'll certainly have to come back to whether we'll...

Male: Excuse me, but what's that distance there? There's no absolute figure.

Male: It will affect different people different ways.

Male: Is that distance two kilometres?

Steve Jarvis: No. All I'm trying to do is...

Male: We're not getting...

Steve Jarvis: ...move it down from the technicalities, it's around about five metres...

Male: The technicalities.

Female: Yeah, are you actually hearing it?

Steve Jarvis: ...and you can hear it. Any further away, all you can hear is the weir noise. So, look, we can talk about science for a long time, but let's try and get to...

Male: But we haven't spoken about science.

Female: To the questions that he hasn't answered.

Steve Jarvis: ...something simpler. This is Romney Weir Hydro Scheme. This is something that, hopefully, we can all get a handle on. Who's not got the sound? Have we got speakers?

[Recording plays]

Male: [Unclear].

[Laughter]

Male: That wasn't bad.

Male: No, that wasn't bad.

Male: That wasn't bad.

Steve Jarvis: So that's the sound of the normal weir. So that's not turned on, and then it starts going.

Male: I don't think - where are the generators, they haven't gone?

Steve Jarvis: The generator is right there. So, this is suboptimal, so perhaps after I've finished, everyone come and have a listen to this, in your own time.

Female: Is that not only one turbine moving and you propose to have three?

Female: We're having three.

Female: So I don't understand how that's going to be comparable.

Steve Jarvis: Again, we'd have to show you the noise in that report that we have made, and the reason behind their conclusions and what mitigation they said we needed to put onto the turbines and the generators to be able to battle all of that sound and make it reduce below the sound of the ambient noise of the weir as it stands. So we can't really go into that level of technical detail without those reports.

Male: But surely that's on a different structure, that's on a level structure. The weir you're proposing is on a dropped structure, and it's going to be much noisier.

Steve Jarvis: Sorry, I missed that.

Male: When that is on a level structure, it's not a weir, you've got a drop of five, six, 10 feet.

Steve Jarvis: Oh no, that's on a weir.

Male: I thought that was level.

Steve Jarvis: No, it's not a weir. It wouldn't work otherwise, it's not possible to have it...

Male: But it's level.

[Over speaking]

Male: I don't think that, but I'm not sure. I'll ask your technical [unclear].

Steve Jarvis: So, the point I was trying to make there, and I can see I've not made a good job because we've not got speakers, is the sound of the weir from 10 metres will be the same sound as with and without the turbines. Chas, that's up there on the Ham Hydro website.

Chas Warlow: That video is on our Facebook page, actually, but Teddington Society members have been to Romney and have made their own video. I don't know where that has been posted. I don't know if any of them are here.

Female: Barry's here.

Chas Warlow: Barry's there [unclear] here earlier, and he will be able to say what his impressions were.

Male: Have you not got video of both turbines, Steve?

Steve Jarvis: Unfortunately, this scheme is only running one turbine because one of them was out of action when they built it. I think they dropped it or something's not quite right. It's not commercial. It's not working.

Male: There's not another one in the country you get a noise report from or a video from?

Steve Jarvis: No, we haven't - see, we've based some of our noise impact statement on - and that's on that scheme, so we had to...

Male: But if it's not working, how can you...

Steve Jarvis: With both turbines running. At this precise moment, there weren't both turbines running, so you've got more to do with flow than with mechanical issues.

Jono Adams: But it's now tidal issues.

Steve Jarvis: Certainly, with both turbines running, they were measured against background noise and the analysis was carried out on that basis.

Male: [Unclear].

Steve Jarvis: We haven't had [unclear].

Male: [Unclear] without the turbine running and proposed...

Male: With the turbine running...

[Over speaking]

Steve Jarvis: That's was back when I saw [unclear] diagram of [unclear].

Male: I'd like to see the...

Steve Jarvis: It's only very close-up.

Male: Can I ask...

Male: Are those published on the website?

Steve Jarvis: They are published on the planning [unclear].

Male: Could I ask why it's necessary to have the turbines at the top of the screws? Would it not be better to have the turbines at the bottom of the screws?

Steve Jarvis: What do you mean? The top of the generator?

Male: Yeah. So you've gone for these Archimedean type screws there. Could you not have something on a horizontal axis with the generator buried underneath the river? That way, there'll be no acoustic noise generated from that. We've got examples of that also in Europe of these types of process. Or could you not have some sort of gearing mechanism whereby the energy is taken from the screws and taken to a generator that's some distance away?

Steve Jarvis: I'm sure our technical advisor could answer those questions, and the environmental considerations, as well.

Male: [Unclear].

Steve Jarvis: Our choice of the technology was kind of dictated.

Male: Why was it dictated? Because there are other options that could...

Steve Jarvis: I can't really discuss - I think I should take that later and [unclear].

Male: I think that is important for people to know why this particular technology was chosen. Where is there a similar scheme and where is there around in the UK of this size, and where is there a scheme which actually has a tidal flow to it? I don't know any other...

Steve Jarvis: This will be the first one that has a tidal flow to it.

Male: How is it proven?

[Over speaking]

Jono Adams: Guys, we can't take...

Steve Jarvis: Yeah, we're [unclear].

Jono Adams: ...100 questions. We're trying to go through the presentation. All the questions are really relevant and we absolutely need to make sure we answer them.

Male: [Unclear].

Jono Adams: Let's just keep going through the presentation, and then, obviously, some of those questions you've got in your mind may be answered. Then, we will take some questions afterwards when we can. We appreciate that not everyone in the room is here from the team. Then, we will work out how to follow up to get the more detailed answers to you. If you will just be patient and just let Steve just continue the presentation, and then do that.

Steve Jarvis: Thank you, John. So, putting noise to one side and realising we have more work - actually, before we move on from noise, we would operate this under a licence. If it gets too noisy, we get shut down. So there is that safeguard.

Male: What's considered too noisy?

Female: What's too noisy?

Jono Adams: I know it's a concern. Again, we can answer each of these things perhaps later, and we can go through the reasoning behind it if you've got a question

Male: So, remember your questions.

Male: When will we get the feedback once people go away from here? How long 'til we get the feedback?

Female: Can we have the presentation?

Female: Can we have the presentation?

Male: Some of us have come to listen to the presentation. It's constantly being interrupted.

Male: With valid questions.

[Over speaking]

Female: It needs to be interrupted, though, doesn't it?

Steve Jarvis: So let's talk about the environmental impact. Now, clearly there are positive environmental impacts of this. We're using an as-yet wasted resource to produce energy, so we're saving carbon dioxide, but there are potentially some negativities. So when we build this thing, it's going to use up resources. We had the National Physical Laboratory do some work for us that suggested that the product had a nine month carbon payback, so the carbon used in building it was paid back within nine months, and this thing will have a useful lifetime of around about 40 to 50 years.

So, we think it's worth doing from a sustainability point of view with the carbon, and about the time the department got [unclear]. The technology is fish-friendly and the Archimedean screw has been used across Europe and proven not to damage fish. Indeed, we're going to put in a new fish pass that is far better than the current fish pass. We're also going to put in a new eel pass, which currently doesn't exist, so that will help the migration of this endangered species.

There is a scheme operating in the north of England - the name eludes me - where salmon started migrating up an installation of an Archimedean

screw and the fish pass, where previously it didn't exist. So the ecology actually improved. That's where they put the fish pass, it looks like, and that little gap there is like a little place where the fish can hang out if they get too tired. It's like the halfway line.

[Laughter]

Steve Jarvis: As I said, we're putting two fish passes in a place we think is a better installation than [unclear] pass.

Female: Do fish get cut up when the turbines are going?

Jono Adams: No, that's what he said. It's been proven by the Environment Agency that no damage are done to fish. Now, do we have someone from the Environment Agency here to give a better answer than that?

Male: He hasn't arrived yet.

Jono Adams: Sorry, hasn't arrived yet, but when they arrive, I'll ask them to explain that.

Male: Are you going to put signs in the bottom? Fish this way?

[Laughter]

Female: Yes, that's right.

Male: I've worked in [unclear] and I've seen some get out through the present pass. I think it's tremendous, and I'm not disputing that what you're doing isn't going to be good, but they, to be fair, haven't got a minimum one brain cells, have they? [Unclear].

Jono Adams: Do you know what? It's actually quite remarkable. The guy [unclear] put a camera and it took them 30 minutes to work out [unclear].

Male: [Unclear].

Jono Adams: So while they may not have as many brain cells, if you like, they have their own instincts. Thousands of years of migrating up difficult flows have let them work out where to go. I was as surprised as you. Presumably, these fish are smart.

Steve Jarvis: That's how it used to look in the '30s, that part of - [unclear]. Who are we? Who are Ham Hydro? We were created - in fact, Chas, do you want to talk to this one?

Chas Warlow: Just briefly. The whole scheme started when a group of Ham United Group people - that's a community group, obviously based in Ham - decided to look into the possibility of developing a hydropower scheme. We formed the company in April 2012 in order to take part in the process which the

Environment Agency [unclear], basically a tender, and it was open to anyone. It could have been a commercial who won the rights to develop the scheme, that's how it was. We managed to put forward a compelling enough proposal and we were awarded the rights to do so. From that point onwards, obviously, we had to start looking into how we could take the whole process forward. So that's the basic history.

Male: Could you just say that again? So the Environment Agency, as it were, invited proposals for such a scheme...

Chas Warlow: Yeah.

Male: ...and you won that opportunity?

Chas Warlow: Yeah, and not just for Teddington, but through weirs on the Thames.

Steve Jarvis: I think it's probably worth pointing out at this point in time, it started in Ham, but this is Ham, Teddington, Richmond, Kingston, the whole community. We've got the moniker of Ham Hydro at the moment. It sounds quite nice, but it doesn't have to be Ham Hydro. It can be Ham and Teddington Hydro. It can be Teddington and Ham Hydro. It can be whatever the community wants it to be, because this is a community scheme.

Back to your question on this issue. So, this is a picture of the weir as it stands at this moment. Why can't we put it there? It's out of the way from everyone. Those numbers should say 30 each, so in each of these different enclosures, 30 cumecs of water has to go through it, so that's 90 cumecs.

Male: That's cubic metres per second.

Steve Jarvis: Cubic metres per second. Our scheme takes 27. So where does the rest go? If we're going to preserve the ecology of the weir pool, we need to make sure that there's enough water still going into the weir pool, that our scheme doesn't change that. So what we'd need to do is find somewhere else along that weir to allow the remaining 63 cumecs to travel through. Essentially, we'd have to build in two different places along the weir, which would be costly and problematic. So, putting it there is difficult.

Why can't we put it there, because then maybe you could let the other 63 cumecs go [unclear]? The same issue, we've got 90 cumecs, they're 27. But if we look here, we're very close to the navigational channel, and the EA were not comfortable with that because this does produce [unclear]. So the only feasible place that we saw - and the EA agrees with us, because when the EA invited for submissions for this scheme, there were a number

of other competing bids with various different positions, and our scheme where we had put it was chosen for these reasons.

So we're away from the navigation channel, we've only got to find three cumecs to put elsewhere, and we can actually do that in that scheme because where we're going to put it, as the cumecs, 27 [unclear]. I appreciate that's a somewhat technical answer, but there's been a lot of pushback on us as to why on Earth is it there? Can't we have it anywhere else? I think those are the technical reasons. They were very sound technical reasons. Maybe Brendan or Paul, our technical team, will be able to answer them better than I can, but that was my layman's understanding of why we have chosen to put it in the position we have chosen.

Technical information and viability, so back to a couple of questions that we had about what worked out - what type of that technology. So, our technology for that is basically the Archimedean screw. They've been used for centuries to raise water. If you actually let it run in reverse and push water through, it'll turn the screw and produce energy. This is a proven technology um, for hundreds and hundreds and hundreds of years. And, they are operating up and down the country, perhaps not at the size that we're proposing, but they are working in, uh, um different parts of the country, and Brendan will gladly tell you a bit about that.

Then, the power for that's just all along the bit where we're generating just under 500 kilowatts of power, uh, through those three turbines. And the point about it being tidal, the first place that tidal has operated, um, at a lower head - so a lower head, so lower potential energy is being produced - will only have one or two of the screws operating. We told you that, um, uh, excess noise can be created. That one screw is operated and will be a variable speed screw, so it'll always be full, it'll just be going slightly slower than the other ones, and that makes an issue with noise. So while it's not proven technology in the tidal space, um it will work.

So, in terms of a construction timeline, it will be very much provisional. We're hoping that January 2014, we'll get, uh, planning approval. We'll run the share issue over the next four months and gain enough money to, to build it, and then we've got right at the bottom, July to September 2015, we start exporting electricity. That's slightly out of date, but the numbers are broadly, broadly right. So we'd look to sell - actually, no, that's fine- just over three and a half [unclear] VAT and a contingency [unclear]. We're building a 15 per cent contingency and we'd be paying that at VAT. Um, a

large part of the revenue comes from a Feed-In Tariff set at 16.4 pence, and they'll also sell back to the grid at six and a half or six pence.

So, who are we and who supports us? We've done this one. Um, these are our supporters. Um, we've had wonderful legal support from Norton Rose, council support from Grant Thornton and various other, uh, political groups. You can see those pictured here, Zac Goldsmith and Vince Cable strongly um, uh support the project. We've had support from Ed Davey down in Kingston. Now, we can add on Monday, um, Greg Barker, Minister for Energy and Climate Change. He was at Duke Street Church on Monday supporting our project. Ideally, we'd like to add you...

Male: He just mentioned the project.

Steve Jarvis: Pardon?

Male: He just mentioned the project, but he certainly didn't support it.

Male: He did.

Male: We were there.

Male: Yeah.

Steve Jarvis: He has said, certainly...

[Over speaking]

Male: He may have said that, but not at the meeting.

Steve Jarvis: If, if I've got that wrong, then I apologise, but I was there, I spoke to him and he said it was a wonderful project.

Um, what we'd like for you to do is get involved. There are a couple of ways to do that. The [unclear] and this will help us develop the project, but what we've said is, because they're commercial projects, once we get proper funding, every penny of that will go back to the Ham Hydro Foundation or whatever we want to call it, and it will help seed other local projects, either on renewable energy or fuel poverty, and I consider that a bit of recycling at its best. Or you can take it a stage further and actually invest in um, Ham Hydro.

As we said right at the start, we're targeting an interest rate in the first year of 2-3.5 per cent, and that grows in line with inflation of the energy prices over the 20-year period. Uh, I know that period is really turned over to investors. You can invest anywhere between £500 to £20,000 and it's a one-member, one-vote, and small, local investors will get priority over large

investors. As we said, we don't want this to be the Big Six, generally, that are benefitting from local energy.

Um, and it is tax efficient, so there are tax reliefs in place such that if you invest, say, uh, let's say £1000, the Government will give you back £300 off your tax bill. You need to have paid £300 in tax for them to do that, and then you fill in the form that comes from the Government rather than - HMRC rather than Ham Hydro. But that, um, does exist.

Then, probably Year Two, we would be paying interest on that, and that's a target focus [unclear] and that'll grow over time. Then, when we get to Year Four, once the scheme is operational, uh, and bank financing will be available, we will refinance that and pay some money back. That will be half of your, your investment back in Year Four. That won't be taken for tax use, that won't have been applied to it. Clearly, there are, there are, there are risks to this, as with any sort of investment. The law may very well change. There are construction and health-related risks. I'll gladly answer any questions on that, um, if there are any.

Um, I think at that point, I will close and we'll open it up to Q&A.

Jono Adams:

Thank you, Steve. Hopefully, that's given you an overview. [Unclear] loads of questions that we've already asked, and I think what we'd quite like to do is probably open the floor to further questions, maybe to start to deal with some of the things that you'd already raised, um, and then see what answer we can formulate now and what an action plan is to get a more thorough response in more detail, um, and where you guys can find that and how we can get that to you.

So, first of all, on our noise. There were loads of questions about really understanding [unclear]. A noise report has been done. The studies have all been done. It's partly across on the planning side, but obviously we can get that published also on our, on our website and our Facebook so that everyone's got those details. So, for some people, that could be very, very useful. For others, it will be meaningless. Um, so, um we'll do that. For those who really wanted us to get in a real feel from the noise, we've obviously got similar schemes, but not the same size, generally they're one or two screws rather than three screws.

Are we able to do a sound recording in terms of a theoretical of at these decibels, this type of noise, this is what it will sound like, and then actually publish that? [Unclear] any others.

Steve Jarvis: I, I think the best way of doing that is that video that I showed of, of Romney where there was weir noise and then the turbine started running and you can hear the difference. Now. . .

Male: One turbine, and a smaller turbine.

Steve Jarvis: One turbine, and a smaller turbine.

Male: No, it's the same size.

Steve Jarvis: Sorry, yeah, it's the...

Male: So, one turbine, [unclear].

Steve Jarvis: One turbine. But the real noise that comes from it is the noise of the generators, and so that's the noise that we would battle out and the noises that show that if you're anything further than five metres away, you don't hear. All I wanted to try and do for that is take it away from the noise report, the studies and the big graphs with lots of different colours and, and, get you to, get you to hear it. I've been up there and there are members of the Teddington Society that have been up there, as well, and if you're very close, you can hear it. If you're personally five metres away, all you can hear is weir noise.

Male: Is this going to run all day, all night, or is it going to be off - because everyone knows that noise travels further at night. Is it going to affect people sleeping?

Chas Warlow (?): The way that there's - all of the background noise measurements that are used as the reference point are the lowest ones. So at, say, two o'clock in the morning. So that's the reference point and that's how, um, the condition that would be placed upon us in operating the scheme, would be to, uh, not go above that level. So it's the lowest level of noise that...

Steve Jarvis: But coming back to is it going to run during the night, it will because the weir runs at night and creates noises at night.

Jono Adams: Can I just hold you there? Guys from the back, I'm afraid that you're all stuffed up. There's lots of room here, so do please come and stand here if you prefer.

Steve Jarvis: Oh yeah, there's a seat there.

Jono Adams: There's also - so you can all get in.

Male: It's not a question of noise, but away from the weir itself and the actual running of it and anything, one of my concerns is, I used to work for the

ship canal and the piling of building this thing is going to go on for two years?

Chas Warlow: No, the construction time is 4 to 6 months.

Male: So what's your point? You're going to have constant hammering of the piles going in, that's...

Jono Adams: No, not constant hammering. If we put [unclear]. Brendan, can you take this one about piling and construction? You've got the more informed [unclear].

Brendan Barrow: Piling and construction?

Jono Adams: Yeah, noise [unclear].

Brendan Barrow: The piling for the [unclear] will be done during the working hours from nine 'til five, so it won't be done late at night, and it'll be just for installing the coffer dam which will take a week at most. It is no piling that will affect the. . . . Then, there will be the removal of all the debris and of the old stuff, and then there'll be the piling and getting to either side of the weir for the...

Male: Is this all going to be done on the river or is it going to be done on the embankment?

Brendan Barrow: It's going to be done off the river, off barges off the river.

Female: To come back to the noise issue, which I think is one of the major issues, that and the visual thing that affects a lot of people here. When you say you could compare it, why don't you, instead of letting us hear it, say look, 30 decibels is - is it half the amount of noise of a jumbo jet, a third of the amount of noise?

Male: If you're in your car, you're probably listening to about 30 decibels.

Female: In your car?

Male: Sitting inside your car, and no more.

Female: Sitting inside your car. So it's about the same as that.

Female: Every car's different, though, aren't they? Some are noisy and some are not noisy, [unclear].

Male: You don't sit inside your car 24 hours a day.

[Over speaking]

Jono Adams: Guys, I think that point's really valid and what we need to do is we need to think of lots of different ways to explain the noise. So, exactly as you stated, none of them are going to answer everyone, and that would be

perfect, but hopefully it will give a flavour. So, any other ideas on how you'd like to hear the noise or have that noise in your head, we will certainly try and do. We highly appreciate that.

Male: I was going to say, there's a big difference between sitting in a Mini and sitting in a Ferrari.

Jono Adams: Yeah, that was just - that was an interesting...

Male: So if you're sitting in a car, which car have you got to be sitting in to do it? One that's stationary or inching off?

Brian Holder: Brian Holder, the Teddington Society. I did the very, very crude video of Romney Hydro. Only one screw was working. I will make sure it's put on the Teddington Society website, and certainly, the Ham Hydro people are free to use that. With the longer recordings, Brian, Elaine and [unclear], who I've just seen somewhere, we listened to the noise and it wasn't too bad.

What David Dechambeau told us, who's built these hydros, he said the real problem is when the water levels drop. And he quoted the DART Project, which is on [unclear], and where they have a serious sound problem. He didn't say exactly what it was, but clearly, it's - I don't think the water running through those is a great deal more than the ordinary sluices. It's not particularly unpleasant. But he warned us, he said, there are serious noise problems when the water levels change, so something needs to be found out about that.

Jono Adams: Can we just, can we answer that question?

Steve Jarvis: Yeah, I think Brendan's the best person to answer that one.

Brendan Barrow: The early screws were made at fixed speed. The screw turns at a fixed speed. When the river level drops upstream, the bucket will turn but the bucket doesn't fill. If the river downstream doesn't flow away because it's ponded or it hasn't got the same slope, the water level downstream is higher than the water level that ends up coming down in the bucket because it's designed to be same level, full bucket, [leads]. So you've got water level that high downstream meeting the bucket of water coming down this stream. Water goes that way.

So, the water then tries to flow into the screw blade. It flows into the screw blade and you get that, the screw blade is going around and the [dark] has a cross-stream support of the bearings, so the bearing hangs, and the water that's just gone splash like that comes up and splashes against the

cross-stream, then goes down and then eventually goes away, and by that time, there's another one. We're using variable speed screws so the buckets will always be filled to optimum so that it should never or shouldn't meet like that. The challenge we have at Teddington is with the tidal coming in, but it will only be for a short period, and we are putting soundproofing around it to stop that effect.

Male: So when you say shouldn't, you don't actually know?

Brendan Barrow: We haven't run it as a test because it isn't in place to. We've designed everything to stop it, but we cannot run the...

Male: So if you build it, it could still make a noise?

Brendan Barrow: We don't believe it will because we've done all the modelling that shows that it won't.

Male: But it's still not proven? You don't know?

Jono Adams: To respond to that...

Brendan Barrow: We can't prove everything until it's built.

Jono Adams: I think to respond to that, what's the level at which...

Male: You can prove an aeroplane flies before you fly it.

[Laughter]

Jono Adams: ...the Environment Agency have given as a threshold where, if it sees that level...

Steve Jarvis: It's not the Environment Agency, it's the council, Richmond Council's condition. If that condition is exceeded, [unclear].

Male: But how are they going to know that? They're only going to know that by people complaining...

Brendan Barrow: No, they'll monitor it.

Male: ...which is not fair, is it?

Steve Jarvis: No, they'll monitor it.

Brendan Barrow: They'll monitor it, and once they discover it's...

Male: No, they won't. They're not going to come out at 11 and 12 o'clock at night and monitor, so the people, the local residents are the ones that will know if that's happening, because you're not going to know when it's going to happen, necessarily, are you?

Steve Jarvis: I know someone from the council is here. How does that actually work?

Male: I'm afraid I'm here to listen, not to get involved in the debate.

Female: May I change the subject just briefly? I'm a health and safety specialist. Then, just moving away from the noise, because I know that's a big issue, but my main concern is the safety of the people on the river. I haven't seen anything about how - what your health and safety management system is.

Male: Risk assessments?

Female: You go through the screw.

Female: You go through the screw?

[Laughter]

Male: It's very fish friendly, but I'm a bit more concerned about the children who are using the river than the fish.

[Over speaking]

Brendan Barrow: The bar screen is 100 millimetre (old money) four inches.

Male: And a child gets stuck on that screen with water flowing through it?

Jono Adams: So, if I can just...

Brendan Barrow: Yeah, there's a flow to...

Jono Adams: This here is a floating thing that's currently protecting the weir. That will be extended and reinforced to go over it.

Male: And somebody that goes under the boom?

Steve Jarvis: The same as if he was going [unclear] now.

Male: No, because you don't have a cage with water flowing against it.

Steve Jarvis: But you've got a sluice gate.

Male: It's not a cage like that, not a monstrosity of a cage that's going to be drawing water into it.

[Over speaking]

Female: My question specifically is, is there somewhere that I could look through to see what your management system is?

Steve Jarvis: Yes.

Female: Where?

Male: And you've got risk assessments?

Steve Jarvis: We have risk assessments going out, yeah.

Male: For human use, not fish? Human?

Jono Adams: Can we just answer the lady's question first of all? So, do we have the health and safety, sort of risk assessments that we can publish that we can provide to start to answer that question? I appreciate we can start...

Female: Who's your health and safety specialist that I can speak to?

Jono Adams: We don't have a health and safety specialist with a big plan of the...

Female: I thought this was going through the board planning.

Steve Jarvis: Yeah, it's very...

Male: You're pre-planning without health and safety or risk assessments?

Steve Jarvis: We have got a risk assessment as part of our initial proposal.

Male: For human river users?

Jono Adams: Yes.

Steve Jarvis: Yeah, it covers everyone.

Female: This is quite different from your initial proposal.

Steve Jarvis: No, it's the same principles and policy.

Female: They're quite different because - I'm not asking, really, about the detail, but the larger picture, because a project at this stage would usually have a well-established health and safety management system.

Jono Adams: I think the best thing, as you're an expert, we'd love to send it to you and you tell us where it's [unclear].

Female: That's not really my job, but I'm happy to take a look at it to answer my question.

[Over speaking]

Male: That's [unclear] one person. Can you not make it available more widely?

Male: Yeah.

Jono Adams: Absolutely.

Male: Maybe in a reduced form?

Female: Also, another thing I want to make clear from the information I've seen is who's responsible for what? So I don't know what...

Steve Jarvis: In terms of?

Female: In terms of – well, mine is mostly health and safety, but who's managing it, what companies are...

Male: The management team.

Female: The management team.

Steve Jarvis: At the moment, we're in the pre-planning stage. When we move to the build stage, all of these things will be put in place. When you put plans together for building an extension on the side of your house, you don't need to show that it's going to - you just need to say, yes, we will do that, because if you don't make it, uh, like a health and safety [unclear], you won't be able to build it. You won't be able to operate it.

Female: That's much later.

Steve Jarvis: So all of those things will be done and put into place, and they have been done and put into place in every other operational scheme that's been built thus far. So the one that was up in Romney, that has river users going past it, it's got a big boom, it's got a big trash screen.

Female: My point is just to say that I'm going to - a few more questions - so you're going to put the health and safety plan into place after it's...

Male: But they've got planning for it on...

Male: What are their plans?

Jono Adams: We have a framework for our health and safety policy, but drawing up a full operational health and safety plan and operational procedure now doesn't make sense. What if we don't get the planning permission?

Male: So, what effect does it have on flow of the river?

Male: Good question.

Brendan Barrow: Could you explain what you mean by the flow of the river? The river has flows in it.

Male: The river does have flows in it, so what effect will that have...

Brendan Barrow: None.

Male: ...this project have on the actual flow?

Steve Jarvis: I can take that. At the moment, what happens is the water tumbles over the weir and effectively stops the flow. You can see here that the sluice gate is open and that is flow. There's no flow happening here and here and here. What a hydro scheme effectively does is reinstates a small section of the river, so when the weir would go over and cause significant erosion the other side of the weir pool, you're putting the screws back, stopping that tumbling effect and putting a flow back into it. But the flow of the river

doesn't change, because if you remember, one of the reasons why we couldn't put it in the middle was because we needed to make sure...

Male: So when the river does start to flow, when you go onto the yellow boards or red Boards, will it have an effect on where the actual water goes? Will there be more water going through those screws?

Steve Jarvis: There won't be more water going through those screws.

Male: So it'll be evenly spread as it is? They'll open different gates at different positions so the water flows through evenly?

Steve Jarvis: Yes.

Male: So you're saying that they won't close certain gates, that it all has to go through those screws to get through?

Male: Excuse me, I thought earlier on, somebody said that there was, in fact, a draw over on the far side, so that you had to be so many metres away from the weir.

Steve Jarvis: That was one of the concerns, yeah.

Male: Is there a draw on the screws, as well, or is it equal all the way through?

Steve Jarvis: Brendan, do you want to take it?

Brendan Barrow: The two gates on this side of the river combine together 30 tons of water a second. The three screws combine together to take 27 tons of water a second. So we will be taking less flow down this side with the gates at full operation than go through there now if they have both of those gates open.

Male: So it'd be less flow in that corner, rather than more flow?

Brendan Barrow: We have had to put in insisting - the Environment Agency insisted we put an extra gate in there that took another 30 cumecs and we end up with the fish pass and the over-fall of that, because they wanted a [sweetener] flow or the bywash flow there, we end up with 30 cumecs there.

Male: There has been word that the Environment Agency wasn't going to control the weir as accurately and as well after this scheme was in, and therefore it risks flooding upstream. Is that true or not true?

Male: [Unclear].

Brendan Barrow: The scheme has been given the responsibility for the first take of the water. After that, the lockkeeper cuts in, and we will be the first two gates operating, and then around there, effectively, the flow is two gates

operating where they operate at the moment, which will be the two - the two gates either end take 12 and 18. All the rest take 30.

Male: So there will be more flow in that corner, then, if you're the first [unclear].

Brendan Barrow: Sorry, we will be taking the first...

Male: So it'll be drawn towards that.

Brendan Barrow: ...30, and then the lockkeeper takes over and does what [unclear].

Male: So there will be at the start of it? There will be draw into that corner?

Brendan Barrow: That's one of the...they either start with those two or those two at the moment, so there'll be the same effect.

Male: There'll always be water going through with a screw.

Brendan Barrow: With higher flows, yes. When the flows drop off, the screws slow down to a stop point with no flow down through...

[Over speaking]

Male: The river hasn't flowed since April.

Brendan Barrow: Sorry?

Male: The river hasn't flowed since April.

Brendan Barrow: That's one of the things that have been put into the dimension model based on the higher year flows, early year flows, [unclear] flows.

Male: We've had three yellow boards days since April, so that means they won't be turning. So they wouldn't have been turning since April.

Steve Jarvis: It's not about the boards.

Male: So it's not about that flow? You don't need that much flow?

Steve Jarvis: It's not about flow, it's about [unclear].

Brendan Barrow: We're actually below the yellow boards.

Male: Sorry?

Brendan Barrow: Our flow is actually below the yellow board level. We are below the cubecs.

Jono Adams: Saying yellow and red boards for everyone else, do they...

Male: It's the flow of the river, how fast the river is actually flowing, how much water's coming down. What they do is they open a certain amount of gates to allow that flow to come through. If there's excess water coming down here, it'd stop flowing.

Brendan Barrow: The yellow boards...

Male: Yellow boards is average.

Brendan Barrow: The non-motorised craft aren't allowed on the river.

Male: No, that's not true. No, it's an advisory warning.

Brendan Barrow: Yeah, an advisory. Advice not to be in the river.

Male: No, it's an advisory.

Male: Is it possible to change the subject for a moment and talk about finance? Would it be true to say that the whole list depends on the rate you're being paid by the grid or whoever you sell it to?

Steve Jarvis: It depends on the rate we sell it at, which is - current rate sells it at 6p. Then, also, on the Feed-In Tariff...

Male: The Feed-In Tariff is a subsidised thing which everybody else is paying for, is it not? Where does the subsidy come from, in other words?

Steve Jarvis: The subsidy comes from - yes, you're right, other...

Male: It comes from us, actually.

[Over speaking]

Male: We're going to pay it twice. You're saying because we're paying somewhere else, we pay our electricity bill and part of that goes towards subsidising the power from here. Is that right?

Jono Adams: No, those will go back to - currently, you pay for other people taking subsidies elsewhere through your tax bill, not through your energy bill.

Male: In whichever case, this is a tax. We're paying for the benefit of a few people here at Teddington or at Ham or wherever.

Steve Jarvis: The whole idea of a subsidy...

Male: Sorry?

Steve Jarvis: The whole idea of a subsidy is to encourage usage and drive down the price, and I think it's what happened with...

Male: Drive down price?

Steve Jarvis: Drive down the marginal price so that you're approaching grid parity. So what we'd quite like to see is the [unclear].

Male: Can I interrupt just a second?

Steve Jarvis: Of course you can.

Male: The cost of generating this electricity, it's more than it would cost to generate from, say, a nuclear power station [unclear].

Jono Adams: Yes, absolutely.

Male: So the fact that it's not very, from an economic - if you looked at it purely on economics, if there were no subsidies, no nothing, it wouldn't work.

Jono Adams: But if you look at, for example, the solar panels on your roof, so if you've got...

Male: We're subsidising those, aren't we?

Jono Adams: So, four years ago, the price compared with now has dropped by 75 per cent, and that has dropped to group parity in many European countries, so it's exactly the same cost to create electricity through localised [unclear] and versus the grid. So that's what the subsidy does, is it helps to enable a new market. So yes, at the moment, the subsidy is to do with more - it's less economical to produce power through a smaller scheme like this as they develop further the expectations, and then the subsidy will drop off as with Ham [unclear]. That is the objective of the subsidies on a national level.

Male: So if we didn't build this at all, we'd actually be better off?

Steve Jarvis: If I could add something...

[Laughter]

[Applause]

Male: Thank you very much.

Steve Jarvis: That's a very good point. Average fuel bills, dual fuel bills are around about £1500. Of that, we're looking at around about £7-£10 is renewable energy subsidies similar to this. So all the solar panels that have gone up, all the wind farms that have gone up, £7-£10 of the £1500 energy bill.

Male: £7-£10?

Steve Jarvis: Yes, [unclear].

[Over speaking]

Steve Jarvis: Let me finish, though, because the biggest subsidy is the eco subsidy which is to put in energy efficiency measures to the poorest households in the UK. That is something that the Big Six energy suppliers have brought now to stop - really, they don't want to go up there and [unclear]. They don't want to go out there and encourage people to use more energy-

efficient appliances. They don't want to go and lag all this, they don't want to put up solid wall insulation. That's what's costing about £150 of your £1500 average fuel bill. The renewables part is £7-£10, but what the Big Six have done a very good job of is trying to blame it on that green C R A P, as David Cameron called it, but the majority of that was to insulate the poorest people in this country.

Male: It's actually anybody - it's not anybody's [unclear].

Male: It's not.

Male: It's not very important though, is it?

Male: It might not be now, but...

Male: It's not now. It was, but it's not now.

Steve Jarvis: That's what the majority of that is, so it is £7-£10.

Male: Let's be fair. If you're going to supply 600 homes, whether that's going to be 100 per cent or 50 per cent, depending on the river, et cetera, et cetera, their fuel bill for electricity is falling, but it's going to take 30 years to pay back your income. Where does that [unclear]?

Female: How do you link the energy generated from this to specific households?

Male: You don't.

[Over speaking]

Female: How do you choose your 600?

Male: You don't.

Jono Adams: That's vital.

Male: It goes into the grid.

[Over speaking]

Female: So how do you measure it?

Steve Jarvis: It's one of those tricky things. If you change energy suppliers, all you're doing is getting a different letterhead on your bill. It's still the same energy.

Male: So which promise are you going to keep?

Female: So when you're saying you're supplying 600 homes, how does...

Steve Jarvis: It's the equivalent of 600 homes. What we would like to do in the future is to set up a community tariff, and people like Good Energy are [unclear] directly from that. That's a very good point, but unfortunately, you buy your energy from [unclear].

Male: Sorry, can I just say, from that last question, I think we're losing the plot here a bit [unclear] because I think the key issue here is, do we have the right, and that's all of us here, to use green energy to affect our heritage? What we're doing here, in my opinion - and I agree, I'm all for this, but what I'm not for is ruining the view above river. Would you be willing to...

[Applause]

Male: Would the planners and would Zac Goldsmith and all your other people allow them to put this on the horseshoe bend at Richmond on the river. I don't think they would, would they, if there were a weir there?

Female: No.

Male: No.

Female: No.

Female: But there is a weir here already, and it's hardly changing is, is it?

[Over speaking]

Male: Oh, that is changing it. They are.

Female: It's an eyesore.

Female: How do you choose your 600 houses that will be selected?

Male: It's a lottery.

[Over speaking]

Female: I actually want to get an answer to that, because if it's a community project, which 600 houses are being chosen to benefit?

[Over speaking]

Male: In the interests of space, there are quite a lot of people in the foyer, so we're actually going to open up these doors here, and keep the debate flowing.

Jono Adams: Can I just say, as there are so many questions and we're not going to have time to answer them, I may just need to open the floor to questions and then what we will do is we will work out the best way to make sure we write out those questions with the answers so far and then get those back to you? So I think the most important thing is, when you want those, if you make sure you take the website address of Ham Hydro, and that can then obviously lead you through the information as it comes up. We're just going to open up the room, just so there's...

Male: Excuse me. My question is [unanswered], and I spoke to you both before about this, and the gentleman there asked the same question. How are we going to get the answers to what you're saying? You've been going for two years since 2010 - three years, sorry. I've never - and I live on Broom Road, which backs onto this thing, and I've never yet received anything through my letterbox to tell me what the hell is going on.

Female: Neither have I.

Female: Never.

Female: Hear, hear.

Jono Adams: That's the point of meetings like this, and we want to...

Male: But how do we know that...

Male: I wouldn't have gone to that meeting tonight if it wasn't for friends. Loads of them live up the top end of Teddington.

Jono Adams: I'm very glad that those friends in Teddington brought you here tonight. We will do a...

Male: Why didn't you bring him here as an organisation?

Male: They haven't.

Female: But why?

Jono Adams: We did an extensive...

Female: [Unclear].

Jono Adams: ...leaflet drop. We put notices up about the place.

Male: No, you didn't.

Male: No, you didn't.

[Over speaking]

Male: You've not put a leaflet through my letterbox.

Male: No, me neither.

Male: But I live on the corner.

Male: Everybody's here, though, aren't they? There are a lot of people here, that's the problem.

Male: I'm from Wickham.

Jono Adams: Can I just...

Male: We might have restricted it to [unclear].

Male: Broom Road.

[Over speaking]

Jono Adams: Could I just say, excuse me, can we just move through to here to allow people...

Female: Can I just ask one quick question? Because I've got a club room full of young children waiting for their dinners. Have you taken into serious consideration the health and safety of canoeists on the river? Because we have juniors coming down the back stream past Lensbury, turning at the bottom, going round here. It'd be very, very dangerous, and that is one point you really must consider is the youngsters. I am talking about eight and nine year olds who are in control - with coaches, but they do need to be sure that they're going to be safe. If they fall in - and kids do fall in, believe you me. If kids fall in there, what's going to happen? That river's - even just flowing normally in the summer.

Steve Jarvis: That's something we have to think about.

Female: You really must think about it.

Female: It should have been thought about.

[Over speaking]

Steve Jarvis: We have talked about how there is a floating boom there already.

Female: Yeah.

Steve Jarvis: That isn't going to be a great deal of help [unclear]...

Female: The other thing is...

Steve Jarvis: ...that section of the weir, the implications of that [unclear].

Male: If you do go on it, though, it'd be more severe.

Female: More severe going under.

Male: At the moment, worst case scenario if you did go under the boom was you could hit the weir face, but would it be more severe if the entrance to the turbine was there?

Male: They'll be sucked onto your cage. We're building this cage. Someone is going to get sucked onto that cage.

[Over speaking]

Female: Can I just say...

Jono Adams: Listen, I'll make this question - we will make a list of the questions that we've got tonight, and there will be more questions. We'll do many more of these, uh, meetings, and then we will work through...

Male: When are you going to do many more of these meetings? You're going for planning in January.

Female: Why do you have to get a suggestion from. . .

Male: Yeah.

Female: ...us to consider that thinking?

Male: Why don't you have the answers?

Female: I just find that shocking.

Jono Adams: I think we have already discovered that there isn't going to be a great deal of difference between the flow rate going through that scheme and as it currently stands.

Female: How do you know that?

Steve Jarvis: How do we know that? Through the modelling that we've already done, and put them to a consultant.

Female: The modelling I've seen is a Styrofoam and paper plate. . .



[Over speaking]

Male: No, the technical model.

Female: The [unclear] say was the [unclear] into the navigation channel because there was more draw than the river. When you explained to me why you couldn't position it, you said that it shouldn't be put nearer to the navigation channel because it had more pull than the weir.

Steve Jarvis: Yes, that's understandable.

Female: Therefore, you have stated it has more pull than the weir.

Jono Adams: Steve Naylor from the Environment Agency is here tonight.

Steve Naylor: [Unclear] the question of why it's not further out than where it is. There's a good reason for it being placed where this is, and it's not just about the draw. It's for environmental reasons, as well. You're probably where that there are existing fish passes at that point.

Female: Yes.

Steve Naylor: There's a good reason for that, and that's because it's at the top of the weir pool, and fish going round the weir pool are either coming up the bank, coming upstream and coming up the right-hand side, or coming up the left-hand side, even though it's round the end of the weir pool, and it'll come to that point. That's why the fish passes are there, so that's a natural place to put the new fish pass, basically. That has to be there next to the turbines, because the turbines provide the attraction for the fish so they can go through the fish pass.

[Over speaking]

Steve Naylor: They come down through the turbine and they go up through the fish pass, so there are environmental reasons why it's there. There's also the fact that it is as far away from the navigation as we can put it.

Female: Then, [unclear] navigation because of the [unclear] and the children.

Steve Naylor: The pull...

Female: The pull.

Female: What about the river [unclear]?

Male: Can I just say something about the children that use that? The canoeists and kayakers will go into that particular corner to keep out of the way of the boats that have navigated, the motor boats, so they actually go into there to actually turn around. You get a lot more beginners, a lot more non-motorised users in that particular area where you're planning on building this.

Female: That's the sort of thing that would come up in your risk assessment.

Steve Naylor: The gates are there already that provide a pull and there are gates that provide a draw, so there is - as you can see on the map, there's a safety barrier across there already, and that obviously will be maintained.

Male: But children and humans can go underneath that barrier. It doesn't go to the floor.

Steve Naylor: No.

Male: So they can still go under it.

Steve Naylor: They can.

Male: They can still get caught not his cage which is drawing water into it.

Steve Naylor: Yeah.

Female: [Unclear] this gentleman, he's very right. Our children are all [unclear] because we're limited on the numbers, but there are an awful lot of children who come onto the river in silly little boats in the summer, and they'll say, oh great, let's go and have a look down the weir, because believe you me, children have no idea of danger.

Steve Naylor: Absolutely, and that's why it's got to be designed right. But there are takes throughout the Thames, enormous offtakes for Thames water, for other schemes, for all sorts, power stations. There are offtakes of all sorts throughout the river. Obviously, you've got safety concerns about children. All over the Thames, there are, obviously - I deal with throughout the length of the Thames, there are canoe clubs, children, rowers, all of those sorts of people, so it has to be understood, and we absolutely understand that that is a concern. We have already discussed the safety aspect of that.

Female: Yeah. My question is about. . .

Male: I'm very sorry, but we haven't.

Female: . . . you have to *design in* health and safety, so if health and safety doesn't feature as part of your design at this stage, or part of your planning, then it's fundamentally flawed from a health and safety point of view.

Steve Naylor: Yeah, I mean, In terms of the licensing...

Female: So what health and safety have you *designed in*? Because it doesn't sound like you have designed it.

Male: You have for fish, but not for humans.

Steve Naylor: In terms of the screen that the guys were talking about, we've got a hydropower scheme, the Archimedean screws. You don't need to screen it

for fish. So there's no need to have a screen on it. Obviously, the screen is there to stop other things like large debris and humans and other things from going down it.

Female: [Unclear].

Female: But by then, it's too late.

Steve Naylor: The screen is designed as a safety feature. That's what it's designed particularly for. It's not for fish.

Male: Let's be fair, there have been instances - I appreciate, rare - where children in swimming pools where the grating is for their suction have been stuck on there. This is going to be pulling a hell of a lot more.

Male: Yes, it is.

Steve Naylor: . . . and every year, we have people dying on our weirs.

Male: But do we want more?

Female: But you have the opportunity to prevent that...

Male: Do we want something that kills more people?

Female: ...via a health and safety plan, but you haven't even considered it until after planning's through.

Steve Naylor: The design is being considered now, so. . .

Male: You can almost put a [unclear] through it because that's pretty good at the moment.

[Laughter]

Brendan Barrow: One of the design features - I need a drawing, but I haven't got one. If you take the three screws that are coming down, the trash screen - and I'll call it a trash screen because that's what it's initially designed as - is at an angle. So if a person fell in and got drawn onto the trash screen, they would be shoved to the right because...

Male: What angle, though? It must be a very steep angle, though, because on there, it looks quite flat.

Brendan Barrow: It's round about 30, 40 degrees because...

Male: Not according to your diagram, it's not.

Steve Jarvis: You mean this?

Male: There is no way somebody is going to get pulled around that screen. They will be stuck on that screen.

Brendan Barrow: They should be able to be pulled across it.

Male: No chance.

Male: I don't believe it.

Female: Have you tested it?

Male: You haven't looked into it. You haven't considered the health and safety of river users. You really haven't.

Female: It hasn't been thought of.

Male: It hasn't been thought of.

Female: I would have said that the water does not open on this side. So the water is not open, so I don't know what you've been thinking about [unclear].

[Over speaking]

Brendan Barrow: Nobody should be in there because there's the guard across, but that's...

Male: But people do go in there.

Female: By then it's too late.

Male: We're talking about the design of the...

Female: But if you haven't done a proper risk assessment now, then you're missing tons of opportunity to design in health and safety for people and not talking about once they've gotten to the trash screen. I just find that the wrong way round.

Male: Can I ask again why this particular design for the Archimedean screws was decided upon? There are many others that have a much lesser visual impact, and I've seen examples of this myself in my own work. So, why this particular version where - because you've got to put a high elevation. We've all got to do [unclear] that go with that. So why was this decided on rather than other opportunities?

Brendan Barrow: The stipulations are so high, is that all the electrical equipment is out at the [unclear]. If you haven't [unclear] level, which makes it 2.7 metres [unclear].

Male: So, as the EA, you wouldn't sanction the construction underneath the river or the generators?

Steve Naylor: They have the turbines which are more [unclear].

Male: Yeah. So there aren't many other examples around the world where your generators are - just basically, you build a proper coffer dam, you excavate

to put your generators below, you've then got access going to that point. So you have nothing above the ground. I've seen other examples elsewhere where they're really - above the head of the river, you're talking perhaps a metre, give or take, at most.

Steve Naylor: [Unclear] are the only other one that would probably be similar to this mouth flow and the head drop at the weir. They are not [unclear] because they [unclear], basically.

Male: That can't be visible.

Steve Naylor: Yeah, so you have to screen it. The main problem you've got on this part of the Thames is this eel passage, and the baby elvers, they need a screen of something like two millimetres, which is tiny. So if you were screening that, you'd have to have an enormous screen and permanent screen clearers to keep them clear.

Male: Is that not an option, to have the screen clearers?

Steve Naylor: It just adds to the environmental risk, basically, of having such a small neck.

Male: So that extends it, then. Why have the generators there? Why not have this mechanical feed off the turbines to change or whatever system you use to take - essentially, to have your generators some distance on land, if you like, and then you could much more easily replace those and sound insulate them.

Brendan Barrow: We could quite easily, in theory, build the turbine, the generation gearbox at the end of the screw, and it would have a sluice gate at the end of the screw to stop the flow going through, which would be a huge flood risk. It would be a complete blockage to the flow of the river when it floods again, all the debris everything out of the flood that we can, so that in a flood event, the water goes through. If you put something in the way of the flood, you have to then make more sluice gates somewhere so the gap was closed.

Male: There's existing infrastructure on the flood plain at that point, anyway, though, isn't there? The EA's got their monitoring...

Steve Jarvis: We've got a small hut there, yeah.

Male: ...gauge there. Could that not be redesigned in some way?

Male: If you mean straight to generated gearbox in the sluice gates, no.

Steve Naylor: It's not big enough for all the equipment, I think, that you also need. Certainly, it could house possibly some of the control systems, but it was, again, in the flood plain, so...

Male: But it could house the control system.

Steve Naylor: Yeah.

Male: Why have we gone for such a big structure? Because when this was first mooted, it was quite a small structure you were considering, and it's suddenly grown hugely.

Female: Can I just say something totally about the whole planning? If you can't plan a meeting which is advertised to start at three separate times when people can come in and listen to you and then go out, what faith do we have in anything you're telling us?

[Applause]

Jono Adams: [Unclear] meeting has been as a result of constant interruption.

Male: No, it hasn't.

Female: You should plan it.

[Over speaking]

Female: You should plan it and manage it to make it democratic.

Jono Adams: It's not my meeting, madam.

Male: So are you saying that you'd like a new bunch of people who are out there now [unclear]...

Female: No, not necessarily. I'll like them to structure it so it was as advertised, three separate meetings with, I assume, questions at the end.

Male: You advertised three separate presentations, 6:30, 7:30, 8:30. Is that right?

Steve Jarvis: We had a lot of questions, as you know.

Male: Did you not expect a lot of questions?

Steve Jarvis: Yes, but at the same time, it is quite difficult to manage this particular situation, but I think what we could do is we could stay...

Female: It's not a big meeting to manage.

Male: It's not as big as your project.

Jono Adams: We're happy to rerun the presentation for those who obviously haven't seen it, who didn't arrive first of all. We've made a note of the question list and

we appreciate that you haven't had a chance to respond to those questions, and in some instances, aren't able to respond to those questions this evening. So, for those in the room who are obviously keen to get questions that are outstanding, let us run the same presentation we did earlier this evening again, and then we will have more questions and answers after that. Back soon.

[Over speaking]

Female: It's been very badly researched.

Brian Holder: Your design is twice the size of the one at Romney Lock, because they're using pivoting technology, which means not only can they flip the screw it out of the way in the case of floods, but they can optimise through the screws and reduce the size. You've extended your design for a considerable way upstream. There is nothing upstream at Romney Lock. You should be aiming for something like that, and just a smaller design.

Male: [Unclear].

Jono Adams: That's not a bad question. Let's move forward with the presentation, and I'll take that question accordingly.

Male: [Unclear].

Male: Can I say one thing? I hope you are all around the day that somebody dies on that structure...

Jono Adams: We absolutely take on-board the health and safety and...

Male: ...because you have not considered the health and safety of the river users. That man there admits it. You haven't really taken into consideration human users.

Jono Adams: We will respond to that.

Male: Absolutely outrageous.

Jono Adams: Bear with us while we just restart the presentation, then Steve will go through the presentation. It'll take about 20 to 25 minutes, then we will have Q&A for the rest of the evening after that.

[Interruption -- conversation outside:]

Paul Parker: How was the...

Female: I don't know. I'm a bit disappointed, in all honesty...

Paul Parker: In the presentation?

Female: ...because I wanted to come with an open mind, but I feel like all the questions have been avoided.

Paul Parker: In the presentation or at the end?

Female: Just any question that was asked, I just felt like they were a little bit avoided, and I just wanted - all the questions that were being asked, I thought were all valid, but I just felt they talked around the answers and didn't give a direct answer, which is a bit of shame because I really wanted to get a better understanding and understand the worries.

Paul Parker: I think the worries probably came out more than the answers did, from the sounds of it.

Female: But I felt like the reason why there were more and more questions was because the questions weren't being answered.

Paul Parker: Yeah, I don't know. Maybe I should have been in there answering questions than standing out here.

Female: So I'm going to go back in and I hope that the answers will be made.

Paul Parker: Yeah.

Female: I'll persevere.

Paul Parker: We're all around, so if you've got any individual questions to just answer...

Jono Adams: Yes, so while we're starting, absolutely - so just walk around the room. So, my name is Jono Adams. I've just recently come on-board to help organise Ham Hydro, so I'm standing at the front because I'm the person who's entirely ignorant on a lot of details, and therefore, best able to direct it to the best of the team. Steve is the MD of Ham Hydro, doing a presentation, and there's Chas - could you put your hand up? He's been involved with the project from the start. Then there's Paul and Debbie at the back. Who else have I got? Also Brendan, as well, who is our consultant on the hydro side of things. We also have a representative from the Environment Agency - sorry, your name is?

Steve Naylor: Steve Naylor.

Jono Adams: Steve. Okay, over to you, Steve.

Steve Jarvis: First of all, thanks very much today for coming and apologies if we're running over time, but there are a lot of questions. I'll try and rattle through some of this session a bit quicker than the last one. So, why we're doing it, we want it to empower and power the local community. It will power the equivalent of 600 homes. Otherwise, that resource will be tumbling over

the Weir and be wasted, so we feel that we have an obligation to try and harness that energy. The other point is, we're thinking of actually complementing past the current Weir structure without adding to the noise. It's a technically robust, proven technology. We have Archimedean screws, [unclear] and this will just use that.

It is financially viable. It proves it meets stringent hurdles and those hurdles will be evidenced in a community share issue, which we hope the community will buy into and the community will benefit from a return from owning and generating operation. In addition to that, the community ownership angle, 10 per cent of the profits will go forward to a community fund which will help see other projects locally and other fuel poverty alleviating projects locally, and over its lifetime, we think that that could add up to about £500,000, which will be a wonderful resource to have in our community.

So, where are we in the process? We're in the final stages of planning, and potentially, there's a hearing in early January of next year. We're also in the first stages of the community share offer and that early stage is to help finance our planning and various other ancillary services before we start in earnest the building of this thing, and that money will be spent on more stringent technical designs. The planning process is more about the look and feel and the technical viability of it, and whether the community wants this or not.

Once we've got that initial raise to be able to firm up the designs, and then the most exciting part of it is the second stage coming into [unclear], which is to raise just under £5 million, which will give us enough money to build this thing. We're estimating a rate of return over its lifetime of 8.5 per cent. So it's not spectacular returns, but we consider that to be a fair financial return on investment. We think we'll be operational by the mid to end of 2015, so starting to generate electricity and exporting it to the grid by then.

So, the key benefits. We've mentioned the fair financial return. I know the thing that really gets me about it is that the profits from electricity generation will be kept in the community, rather than going to the big six. It's a local action on what is a global issue. Climate change is often felt to be too big an issue to be dealt with, whereas if this can be a blueprint for other schemes across the country, by acting collectively as a community, we can make a difference on what is a significant issue for our country and, indeed, our planet. It'll also provide a good educational resource that schools and universities can draw upon in the future.

Again, there's a fair percent of the profits the community [unclear]. Now, we wanted to come here to address some of the potential negatives of the scheme, and there are a few of those, and I think we can probably add to that health and safety, following the discussions that we've had there.

Female: You're right, it really should be at the top.

Steve Jarvis: So I would like to go through a few of these things. So, visual impact is something that's worth looking at. It's already an industrial structure. That weir was put in place 100 and a bit years ago and it's very utilitarian in its nature, and we've grown to love it for what it is. We would like our scheme, the Ham and Teddington scheme, to become just as well liked as that weir is currently, and hopefully, we can improve upon what's already there. So, this is a view from the bridge over the Anglers. We propose our scheme will be there.

In terms of the Google Maps view, it's there. If you were stood on the bridge by the Anglers with a pair of binoculars, that would be what you would see, but without the roof. That's the one montage where we've left the roof on, but the roof makes it look much higher and much bigger than it actually needs to be, so in our designs, we have removed that roof. We've unfortunately not had a chance to do that as of yet. This is what it looks like from up close and personal.

Female: It's huge-looking. Huge, hideous.

Steve Jarvis: So again, it's probably worth saying that that is from very close by, and that's actually the river, that's not opened to the public, so you don't get that. Your nearest house is some 750 metres away. I think Broom Road is probably the nearest house from that, so from there, you will tentatively, reasonably.

Female: I live on Teddington [unclear].

Female: Please could we have a whole presentation without interruption of questions and have all the questions at the end? Some of us have waited more than an hour just to see this presentation. Thank you very much.

Steve Jarvis: Bear those in mind and I'll answer those at the end, then. This is the view from the house side, so the current view without it and then fading it in. So, the outs and then back in. Then, that's the view from the other side, just with this, actually. Again, we're trying to make it look and feel like using the arches. I think we can probably do a slightly better job of adding a few curved lines in there. Those are the more aesthetic things, but that's the

technical design, is that. Then, here is the view from the Lensbury terrace. So that's without the scheme and then, that's with the scheme.

Just to add, I've marked out in a red line where it would be and then if we - what I hope not to do is paint a picture of it being completely unobtrusive, because this is a piece of engineering and it's going to have some size. So if you are close to it, this is how we had previously mocked it up and it was quite big from very, very close by. The roof was not liked, and I would agree with that, so we finally took that off. What I'm going to try and do is consult and try and make a piece of engineering that is something that will be utilitarian, but also something that is amenable to the users of that stretch of river.

So, we tried to consult. We've consulted with Lensbury, we've consulted with various other people, and we continue that consultation process in terms of the look of it. So we've lowered it, taken the roof off and hidden some of the screws. There is more we could potentially do. These houses there could be reduced in size, potentially improved upon. We talked earlier about potentially lowering that has had other impacts and impacted into a number of flood risk assessments, but we're not ruling that out, that more can be done with that design to make it more in keeping with the current weir structure. Again, there we are from the Ham river banks.

So, those are the key slides on the visual impact, and if you have any questions, hold them and we'll come back to them at the end. The other area that we had concerns - the concerns we want to address are on noise. Many people are concerned that this thing will make a huge noise and be heard for miles around. We've had three noise surveys done and lots of very complicated analysis producing charts like this, and the pink is where the generators are.

So that is very, very loud, so if you're stood on the generators, you will hear it. You won't just hear the noise, you will hear the whine of the generators. However, if you step away from it, so if you're just the light green, you're looking at about 30 to 35 decibels. Someone asked in the previous presentation, what does that actually sound like? Thirty to 35 decibels, the background noise is - that's someone's front room. So it's almost imperceptible at that range. You step away five to 10 metres, all you will be able to hear is where the background noise is.

Now, the thing about where we're siting it and why we want to put it there is, what is there is a weir, and the background noise from a weir is actually

incredibly loud. All you will hear is weir, unless you are right on top of this thing. That's what our noise surveys say, these complicated diagrams. Even if you add 10 decibels to it, you still have to travel 10 or 15 metres away, and all you will hear is weir noise. If you look at those key buildings from the Lensbury, you won't be able to hear anything more than 35, 40 decibels, and on the Ham side, again, you're perfectly into the green sounding, so very low levels of noise. All you'll hear is weir, is the message I get there.

So, I'm trying to keep it simple. Those charts were quite complicated, and I'll admit that this is not scientific, because I want to move away from the science. Those reports were very scientific. That's the noise profile. The closer you are to it, the noisier it gets. The further you're away, the quieter it gets. So that's our scheme, and then that's the weir scheme. So at one point, there is going to be a crossover, and that crossover is in the five to 10 metre range, when you go from hearing the generators to going to hearing the weir of the background noise.

That's true day or night. So, if at night, you can hear the weir, you'll probably hear that rather than the scheme. It won't be operational if there's no weir noise, because there won't be any headed water.

Now, unfortunately, we don't have speakers here, but what I wanted to show you and what I'll make available to you on the Ham Hydro website and on our Facebook page, if you care to leave your email address today, we'll be able to contact you and send you this, is what a scheme actually sounds like in operation. So perhaps if you can't hear it, we'll do it - you can come by and listen to it at the end. It illustrates the point. So, first of all with the screws off, not turning, all you hear is weir, and then later, they'll turn.

[Recording plays]

Steve Jarvis: So, you probably didn't quite catch that, but there was an imperceptible difference in the noise levels. I certainly couldn't notice it. Admittedly, this is a poor sound system, but the one thing I will say is David [unclear] at Romney Weir was commissioning this thing, and when we go back nearer those houses that were close by, he's in close dialogue with those residents, and had a conversation with them and said, have you noticed any noise from the weir here? It's, no, have you turned it on? They'd been commissioning it for three to four weeks, and the residents of that scheme had not noticed.

So, we don't think noise is an issue. The council don't think noise is an issue, but we understand that local residents are going to be concerned, and so any amount of clarity that we can try to provide around noise, we will do that. As a development organisation, we are very comfortable that noise is not an issue, but we realise that it's a massive hot button, and if we are a community scheme and properly listening to our community, we have to address those concerns properly. So please do come to us, and we will provide as much information as we possibly can to assuage those concerns. The only thing to say is, if the noise levels rise above - what's the level, 55 decibels?

Male: That's 35.

Steve Jarvis: Thirty-five decibels, we get shut down. We get shut down by the council and the council will monitor us if our scheme goes above that. At certain distance points, we get shut down. So even if this thing does prove to be noisy, it won't be noisy because the council will shut us down because we're operating on their licence. As I say, we're aware that this is a big concern, so do come to us. Don't just take our word for it. Members of the Teddington Society have been there and looked at that, and the way that their scheme operated, they had no concerns with noise. They had a few other concerns with it, but it wasn't one of operating noise.

The other point I want to highlight is the environmental impact of this thing, so sustainability, the National Physical Laboratory have run a survey for us and they think that the project has a nine month carbon payback period. So it will use materials, it will use CO₂ to build this thing. That will be paid back within nine months in terms of the energy that it produces, the green energy that it produces. In terms of the carbon, uh, that it saves, it's a dozen tons of carbon dioxide annually saved from, um, from our scheme. The other potential thing about it is, although it's not going directly to people's houses, this scheme will power 600 homes or 80 per cent of the schools, uh in the Richmond Borough.

So, it's a big enough installation that it is producing significant amounts of energy. It's fish friendly, and we have a member of the Environment Agency here if anyone has some questions about this, but they are the preferred technology of, uh, of the EA. They have minimal impact on downstream operation, um and we have multiple studies that proves that fish can pass through, and there's minimal damage if they are hit. The other element is, we are putting in a better, wider fish pass, so fish will have an improved environment because of our scheme going in.

So, this is what the fish pass will look like. Those little green things are things that they can wriggle up, and then after that, if the fish get a bit tired, they can have their little hangout in the little pond there, and then they move up again. So yeah, we're putting in an improved fish pass, and an eel pass where one did not exist previously. So, Chas, did you want to talk a little bit about who Ham Hydro is?

Chas Warlow: Ham Hydro was formed by members, initially, of Ham United Group, which is a unity group, obviously based in Ham. We formed a steering group to look into the possibility of developing hydropower on the weir. We then formed a company when the Environment Agency opened up the possibility of developing a project on three weirs off the Thames, Teddington being one of them, and we needed to be incorporated to bid for it. Effectively, it was like the tender process.

So, that's what we did. We incorporated, we put together the proposal, and eventually, after I don't know how many months, Steve, we were awarded the exclusive right to build the thing. We were tied together to a construction company, so this ideal scenario for the EA is for us to work with an EA-approved construction company in order to actually do the physical civil construction works themselves. That's the basic history behind the formation and development of the scheme so far.

Steve Jarvis: I guess the thing is, it started off in Ham, but it is very much a community organisation, so it's going to be called Ham Hydro at the moment. None of the current directors care if it comes to Teddington Hydro or Hounslow Hydro. I personally live in Richmond. I don't think I've got much chance of calling it the Richmond Hydro, but we want to see this resource built and we don't really care what it's called. Now, one of the other concerns that we've noted is the position of this, and this comes back to the visuals. Is it in the right place? Fortunately, now, we've got a member of the EA here who can tell me if I'm going anywhere wrong in any of this.

Steve Naylor: No.

Steve Jarvis: But I try to understand it from a layman's point of view because I'm not an expert in hydrology. We had experts within our team and organisation, but I wanted to try and boil it down to, why on Earth can't we just put it in the middle away from view if people think it's ugly? Why not there? Each of those little sluice gates takes 30 cubic metres per second of water. Our scheme uses 27 cubecs, cubic metres per second of water. So where would the rest go?

If we're to preserve the same flow into the weir pool with our scheme, we need to provide the place for an extra 63 litres cubic - per second. That would mean building somewhere else in the scheme, so that would be both costly and difficult from an engineering point of view. You can put it there because it's got to go elsewhere along the weir. Why not there? Now, Steve, you might be able to answer this better than me but one of the reasons that we've been proffered was, if you put it there, then 63 units could be pushed through there, but that could potentially affect the navigation channel. Is that reasonable?

Steve Naylor:

Yeah. From a construction point of view, the Environment Agency didn't want any of the existing gates in the zigzag section touched, because they were built as one single structure of everything. So starting to break out part of that would be more difficult, but also, anywhere beyond the roller sluices, you're getting towards a navigational area. Now, I mean, even at the core, it wouldn't cause a problem, but if you moved it around to the top area where you've got the overspill there, then that would be right next to the navigational channel, so that wouldn't be acceptable.

I think, for those who were here earlier, the main reason why it's where it is is from an environmental point of view. That's the head of the weir pool and that's where fish will head to naturally, and that's where the fish pass will be. So that's the main reason why it's put there. I know there was also a question being raised about, why is it extending upstream so far? Why is it so big upstream? The main reason for that is because we asked Ham Hydro to move the scheme upstream to make it in line with the rest of the weir where the tow is of the roller sluices.

Again, the reason for that is because fish coming around the weir would find the fish pass easier if it's all in line at that point. If it was poking down into the weir pool, the fish would come round and then have to go back into the weir pool that they'd come round. It doesn't seem like a big deal to us, but for a fish, that apparently is a problem. I'm not the fishery's expert, but that is the guidance that we've given Ham Hydro, is to move it all in line so it improves the environmental performance of the fish pass [unclear].

As we've mentioned, the two fish passes there at the moment, you're probably aware of. They're designed for salmon and sea trout. Now, whilst it's a long-term aspiration to return salmon and sea trout in their numbers to the Thames, it's not happening in great numbers, and those fish passes really aren't effective at providing fish passage for a large number of species. So, by putting in a different type of fish pass, we can still pass

salmon and sea trout through the weir, but also a large number of species, as well.

That's why the position there for the fish pass, which has to be coterminous with the turbines because the flow from the turbines provides the attraction flow, is really important. That's the position for it, and that's why it also has been shunted so it's coterminous with the weir. So, sorry to take a little bit over your presentation...

Steve Jarvis: No, no.

Steve Naylor: ...but I'm just explaining why that is the position for it.

Male: Can I just ask, is the priority of the agency...

Jono Adams: We can take questions at the end. We'll take questions at the end, please, at the end. Thank you.

Male: . . . the health and safety of the fish.

Steve Jarvis: So, technical and financial viability. So, the Archimedean screw is a concept that's been going for hundreds and hundreds of years to raise water. If we run it in reverse, we can use the fact that there is a head of water at the weir which will naturally turn the screw and generate electricity at the weir. So all that water that's tumbling past, we can actually use to create clean energy. The power that we're going to produce will be just under 500 kilowatts which, as we said before, is 600 homes or 1000 tons of carbon dioxide annually.

The head will vary and we've built that into our forecast. Clearly, a higher head will generate more electricity and all three of the screws will be running. At a lower head, we'll probably only have one of the screws running, but that has been built into our forecast. We've used 20 years' worth of head and flow data. The key point here, it's about the head, so the height of the water rather than how fast the river is running, that's the key issue that drives that financial forecast.

These are our timelines. We hoped that we would get planning approval granted in early next year, early 2014. Start our share issue in January to April, our community share issue where smaller and local investors will be prioritised. Then, if we look right at the bottom, mid to end of 2015, we could be built and generating electricity. The financial - a good deal of the revenue comes from the Feed-in Tariffs. The company says 16.4p, and that was specifically increased for hydro schemes because there was not enough take-up.

The Government felt that there needed to be a greater incentive to take up hydro schemes. They wanted to see more of them. If you recall, solar panels had their subsidy reduced. This had it specifically increased, and then a sale of electricity to the grid. It's going to cost a little over three and a half million. We're adding in a contingency of 15 per cent and that's based on VAT, so that's why we wrote in slightly more money and it tends to cost a bit more, but we'll pay that back to the shareholders once we know the full bill.

So, who are we? We've done that. Our supporters, we've had wonderful support from a range of different people. Norton Rose, Carbon Leapfrog, Grant Thornton, National Physical Laboratory, they're all there and there are many more besides, and we're very grateful to those. Um, and, I believe we can now add, uh, Greg Barker. He came to our event on Monday and...

Female: I don't think you should reveal [unclear]. It was an energy meeting.

Steve Jarvis: It was an energy meeting.

Female: It wasn't a Ham Hydro event.

Chas Warlow: No it wasn't, that's true. Fair point

Steve Jarvis: Okay, no problem [unclear]. So, we would like to very much add you as our supporters and our stakeholders in this project. We welcome your feedback. If you want to get involved, there are a couple of ways of doing it. You can donate to the Ham Hydro Foundation. That's how we've got where we are, a mixture of people lending us and loaning us and giving us money so that we can take the development stage to its current level. Where we are now, any money that's given to us once we reach proper funding, all of that money will go back to the Ham Hydro Foundation and be spent on seeding other projects similar to this or fighting local fuel poverty, so that's a good example of recycling at its best.

We want to recycle that money back into the community, or for those that want to invest, we will be doing the main share issue, as I said. We're targeting an interest rate of 2-3.5 per cent in the first year, and that should grow in line with the profits of the company, and that should grow - the revenues of the company are growing in line with electricity prices and with inflation, because of those Feed-in Tariffs. You can invest anywhere between £500 and £20,000. We don't want any more than that because we don't want to have one large investor taking up all - this should be a

community-owned project. You become a member of the IPS, which is a one-member, one-vote co-operative type society.

There are other tax benefits of this, so the Government wants to encourage investment into small businesses such as this, and so for every £1 that you invest in a scheme like this, the Government will give you 30p back off of your tax bill. That money doesn't come from Ham Hydro. That comes from HMRC to encourage investment like this. By the time we get to Year Four and the scheme is proving to be as we say it will do, that will allow us to refinance some of that with bank debt and return up to - we're hoping for up to half of the money back that we've provided back to investors in Year Four, and that will not get tax credits.

I think that's probably a decent place to close.

Jono Adams: Yes, thank you very much, Steve, for that, and thank you very much for your patience with all the questions, just in terms of the process. We're expecting all the questions from you now. Some of them, we'll be able to answer and some of them, we won't. So, I'll be making a note of all of the rest we've got and then we will be directing those who visit our website, to a list of those questions and how we're going to respond to those, ok? So first of all, the person I interrupted earlier, is he still here?

Male: Yeah, I've got a question about the profits, actually.

Jono Adams: Sure.

Male: You said you're going to put [unclear] the project at £500,000 [unclear], it's at 10 per cent, is that right?

Jono Adams: That's the ambition, yes.

Male: What's the length of the project?

Jono Adams: The Feed-in Tariff will last for 20 years. We expect the asset life to be anywhere between 40 and 50 years.

Male: So, over 50 years, £500,000 back into the community, so in total, you look to make about £5 million?

Jono Adams: Over its lifetime.

Male: That's pretty low, as far as I'm concerned. What's the point in doing this?

Female: Yeah.

Female: And it also seems like a potentially very high-risk type of investment for anyone to put their money into, I would say. What happens if you make a loss? Who will actually cover that loss?

Jono Adams: As a shareholder, you would put your money in and face a commercial risk, but the revenue element of it is underpinned by the production of the energy. At the moment that we get bank approval, our Feed-in Tariff will be fixed for 20 years.

Male: It's interesting that you're going to raise £5 million and invest £5 million in this to make £5 million over 50 years.

Steve Jarvis: What I'm trying to do is to temper expectations. We will aim to do significantly better than that. The return profile is actually far stronger than that.

Jono Adams: The lady in the first row.

Female: Yeah. You've talked about shares and all of that and how that's a benefit to the community. But if we forget the shares, what other benefits are there to the community?

Steve Jarvis: Okay, the benefit to the community is the community share fund. So 10 per cent.

Female: Besides the shares, because we've discussed that.

Chas Warlow: But not that's not shares.

Jono Adams: It's separate.

Steve Jarvis: That's separate from the shares. Ninety per cent of the profits go to the shareholders, which hopefully will be local community members, and 10 per cent of the profits will just go to a fund that will either give or lend money to other projects locally. So if there's a scheme that wants to help, um, uh insulate people's homes or...

Male: Energy efficiency schemes. You talking about an electric vehicle [unclear], talked about anaerobic digestion plants, if those are what was wanted for small scale projects. So there are lots of different possibilities there.

Female: When do you hope to start implementing those kind of benefits into the community? How far into the project?

Steve Jarvis: Well, from the moment we start generating, um, revenue, 10 per cent of those profits will then go back into that [unclear], that - whatever we call it - that foundation. That will then start putting money into the local community.

Male: So how many years do you expect to make a profit?

Steve Jarvis: After how many years? We'll make a profit from 2015. So in the first year it will - we're constructing. But as soon as we've constructed most of the revenue - uh, our operational costs are going to be around about £75,000,

our, um - so our cost base, and our revenue base should be, depending upon various conditions that the EA imposes upon us, around about £400,000 to £500,000 per annum, then growing in line with inflation. I'd gladly share our full costs with you. It will be in our prospectus.

Jono Adams:

The lady at the back.

Female:

Yeah, I'd like to ask, the picture in the flyer is very different to the one that you had in your application. The acoustic panel's missing. Won't that have an impact on the sound environment?

Steve Jarvis:

So you're talking about the roof?

Female:

Yeah, that's a totally different picture.

Steve Jarvis:

Yeah, that's a very good question. Let me just see if I can get back to the one you're talking about. So that one. That's the roof. It's not an acoustic panel.

Female:

Oh, right.

Steve Jarvis:

It's neither use nor ornament and we felt that it wasn't liked. It was the only piece of architecture that was put in place and people hated it. It made it look far bigger than it was.

Female:

Sorry what was the purpose - what was the original purpose of that?

Steve Jarvis:

It's to make it look better.

[Laughter]

Steve Jarvis:

Our architect thought we needed some curved lines, um to shield the thing, to make it look better, and it didn't, so we took it off. It's not an acoustic panel. The acoustics - and perhaps Paul or some of the other technical team, will actually sit over the top of there and run - there will be a Perspex sheeting running right the way down to the river generation and the sound baffling will sit here, because this is where the generators are. So this does nothing and it wasn't liked, so it came off.

Female:

It actually looks like a World War Two bunker.

[Laughter]

Male:

Actually that's much better. Could I ask something about the organisation? I mean, all this work you've done, the surveys you've had, and the architect, it all costs money. Have you got tie-ups with PLCs? I'm just interested to know where the funding has come from.

Steve Jarvis:

The funding has come from a mixture of donations, uh, loans and grants.

Chas Warlow: Donations from individuals.

Steve Jarvis: Donations from individuals, yes. We have no commercial tie-ups with anyone. None of the directors are paid, or will be paid. As we move from a development organisation, so basically from this point on, once we've raised money we will then start paying professional people to do a professional design job and build this, uh, to the most exacting standards possible. We will need to pay people for that, but it's not going to be us that gets paid and we have no such sweetheart deals with any of our suppliers.

Male: Have you factored that in...

Jono Adams: [Unclear]...

Female: To energise 600 homes, which I presume you're probably considering to do, I feel it's taking a sledge hammer to actually do this.

Female: Yeah.

Female: I really would - if you were talking about thousands of homes, yes. But in a beauty spot like this is presumed to be throughout for many, many people from the centre of Teddington out to [unclear] a place of some environmental [unclear]. It's going to [unclear] but also I'm a member of Lensbury Club and certainly the picture you showed of it there is very nice, with the trees nicely shading out this construction. But in reality I think it will be an eyesore, frankly. I just...

[Applause]

Female: I've listened. I'm just as eco-minded as anybody, but I think this is not the right place and not the right time for such construction. The market and the profitability of it seems minimal, frankly, for the disturbance it's going to cause to keep using the river and to many other projects people might want to [unclear] pick up.

Steve Jarvis: I had a very productive meeting with the chief executive of the Lensbury and they are very keen in principle to this scheme and want...

[Over speaking]

Steve Jarvis: No, no, let me finish. Please let me finish. Please let me finish. Please let me finish. But they do not like the current design and so we want to try and work on that design. A direct quote from Lacy Curtis-Ward, open hands, open hearts, we would look at a new design scheme. Um, and I welcome that.

Female: But can I just finish my point?

Steve Jarvis: Yes, of course.

Female: Has the full environmental impact been considered by yourselves? Also, the long term value of this scheme does not seem to warrant all this. I appreciate you've gone to endless trouble and quite a bit of expense. What worries me is that somehow or other it might creep in in spite of all our feelings of - or being anti this in the first place, which I have to confess I am. I've just got the feeling it will creep through regardless, unless we put up a bit more of a defence...

[Over speaking]

Jono Adams: I have to take questions as...

[Over speaking]

Female: ...what the lady's just said.

Jono Adams: No, well, half a second. The lady there first of all, please.

Female: Following on the environmental impact, generating energy for 600 homes, have you thought that it's going to be blighting quite a number of homes in that area of the river, in terms of the noise pollution-ness? I'm very, very concerned about that.

Steve Jarvis: Well, you make a very good point about noise. During the presentation I've tried to reassure that it will not be any noisier than the weir, unless you are very, very close to it.

Female: But we are. A lot of us...

[Over speaking]

Steve Jarvis: No, no, no. When I'm talking about very, very close, it's five to 10 metres. So from the Ham bank, or any of the houses in Ham, which are the nearest residential...

Female: What about Teddington side?

Steve Jarvis: The nearest residential houses are - the residential places are in Ham and they're - they would not hear...

Female: [Unclear].

Male: So [unclear] is actually the closest...

Steve Jarvis: This is the noise map and again that green is 30 decibels and 30 decibels is equivalent to the room - the noise levels that are in your front room.

Male: Aren't Haymarket developing the entire Teddington Studios site to residential accommodation?

Male: Yes, they are.

Steve Jarvis: Yes, they are, so...

[Over speaking]

Jono Adams: Guys, I'm sorry, we have to take this - it's unfair on everybody else who's waiting on questions. We can only take questions - put your hand up and I will come to you. I'm sorry.

Steve Jarvis: I will answer. So the Haymarket scheme is going to be there for residential and that's firmly in the green camp. So much like these guys over here, all that they will hear is the ambient noise. Unless you consider - why we're building this, it's because there is a weir there and a weir is a very noisy...

Male: Structure.

Steve Jarvis: ...a very noisy industrial structure. So they will hear weir noise. The nearest residential at the moment is in Ham. Different when planning permission is granted in virtue of the Haymarket development all they will hear is weir noise as well. Now, it's a real hot button and people are concerned about noise and I fully understand that. So we're going to have to do all we possibly can to assuage those fears. But the council are happy with our noise assessment and they are going to make us operate under a stringent licence. If it gets too noisy - and those noise levels are very clear and they will be monitored - we get shut down.

Male: Thank you. Chairman, you had a comment about the upstream impact and I'm sure you were going to say that it's not going to have much impact on the flow of water, particularly at very high levels. But it must have some and I'd just like to know what your assessment is and what it's based on. Whether it's based on the latest designs, or whether it's based on the assessments at an early stage in the process, or whether you're planning to have it reassessed.

Chas Warlow: Are you talking about flood risk?

Male: Yeah.

Chas Warlow: Yeah, yeah, so I mean, a flood risk assessment was carried out.

Male: At what stage?

Chas Warlow: At the stage for our submission for planning in November 2011. So at that point we had three turbines. It's still three turbines and so that configuration in terms of the amount of material that has to be taken into consideration

for a flood risk assessment is still exactly the same. So that, I believe - I think you could probably - I mean, it's...

[Over speaking]

Male: Our original design had four turbines in it.



Steve Jarvis: Yeah, it's also worth adding that as part of our flood risk modelling we think - we've added a sluice gate. So we're actually increasing capacity there to handle flows. That's been contained throughout. We [unclear] and there have been no changes to the fundamental design as it impacts flood modelling.

Male: Is the sluice gate a very recent instruction?

Steve Naylor: No, no, no. The original design was four - there was proposed to the Environment Agency was four turbines. When we looked at that, we said, look, guys, you've got to replace the gates that have been taken out with another gate, to make sure that there's no increase in flood risk. So the design was changed to three turbines, plus a gate, plus the fish pass, and that's been designed from very early on, so the flood risk assessment and all of that stuff, we've already been through. We've passed the flood risk assessment and we're happy with it from the Environment Agency's point of view with the current design. That's all the flood risk assessment. So that's all been dealt with.

Male: You're confident it doesn't have any impact at all, particularly on the low-lying properties and all that side?

Steve Naylor: Yeah. Confident that the gate that they're putting in to compensate for the [unclear] that master gate will mitigate any increase. I mean, you've also accepted you've got the gate and the turbines that will be flowing. So what we're working on is the worst case scenario. So if the gates - sorry, if the turbines weren't able to operate, the gate will be able to provide the [multi] flow as well. If the turbines are operating, they're passing flow as well, so there's an additional capacity there. But we - the Environment Agency can't

rely on that, because if these guys for whatever reason have a technical fault or whatever, that's shut down.

Female: We'll get flooded.

Steve Naylor: Well, no, you wouldn't, because that's what the gate's for. So the worst scenario is with those turbines not operable, but obviously if they are operable and you've got the gate, you've got the increased flow through the system. But you've got to work on the worst case scenario. The gate provides that compensation.

Male: It will provide enough capacity if the turbines aren't functioning?

Male: Absolutely.

Jono Adams: Thanks, Steve. Got a question here?

Paul Harris: Yeah. My name is Paul Harris and I'm also a member of the Lensbury Club. I totally support the idea of producing electricity on the weir. It's a responsibility that we all have to the generations to come. We must show examples of this type of technology for the young people.

[Applause]

Paul Harris: I've been talking - not talking directly, I've been emailing Lacy. If what is - I've got no good reason to believe that what you said isn't true - I personally believe that you could redesign this so that it meets the criteria that the club would be happy with, and all the people that go there and enjoy its environment. I think that that is a distinct possibility. I would very much love Shell to come on board with some backing...

[Applause]

Paul Harris: No, let's make that part of the planning, just a night up here, please get Shell on board, get some money into the system, so that we can get it redesigned. Now, you were bumped - I think you were bumped into having this design originally, because the Environment Agency weren't necessarily going to look very easily at other systems that are around the world, would be my view. This one - this system is already in place. The chances were you were going to get planning permission for it.

But I would like to see you, the Environment Agency, working with Ham Hydro, perhaps with Shell and the Lensbury and the Teddington Society to get a manageable, low level system into place. I think that that is distinctly possible. All credit to you lads with that. Absolutely brilliant. I mean,

absolutely amazing. I really think they ought to have it. Regardless of your disposition, I think they need a round of support.

[Applause]

Jono Adams: I'm really to get more questions before we finish. So quickly then.

Male: You said they were obviously using these screws round the country. How many overseas and have they proved financially viable?

Steve Naylor: I mean, there's about - we've licensed about 300 hydro schemes in England and I think that 200 of them are operational. They're not all Archimedes screw design.

Male: But are - some screws, are they? Some are Archimedes screws, are they?

Steve Naylor: Yeah, yeah, certainly. On the Thames we've already got the Romney one that you saw that's at Windsor, Mapledurham - on the Mapledurham Estate you've got a single screw there, and there is another one. I can't - is it Kidlington I think it is, as well. But I mean, there are several others on the Thames that are proposed as well. But there are examples around the country.

Male: Have they proved to be financially viable?

Steve Naylor: My understanding is, yes. I mean, the guy at Mapledurham seems to be very happy with the financial gain from his watermill there.

Male: Do they have - hydro people have the answer to that?

Brendan Barrow: I missed your question. It was about how viable...

Male: The other schemes using Archimedes screws around the country [unclear] and have they proved financially viable?

Brendan Barrow: As far as I know, they have. I don't know that...

Male: As far as you know it's...

[Over speaking]

Steve Naylor: Technology - I mean, some of these designs, like [unclear] and things like that, you get a slightly higher percentage efficiency. These are about 80 - 85 potentially for Archimedes screws, but Brendan's probably best placed to answer this, but there are screws all over the country.

Brendan Barrow: River Dart Country Park is paying back more than it budgeted and [unclear] Mill had to have extra work done on the weir and it's paying back on schedule, taking into account the extra work he had to pay for on the weir. So if it wasn't for that work, he'd be ahead of schedule. Those people are

very - and Osbaston Weir, which is a two-screw system, is ahead of schedule. People are very happy to say, we're ahead of - well, behind schedule, and we feel that because people who aren't behind schedule keep it to themselves, because they just say, we're making what we've made.

Male: How many of those are tidal?

Brendan Barrow: None.

Male: None.

Brendan Barrow: This is the only tidal screw scheme at the moment in the country. There are a couple of tidal mill schemes proposed down in Hampshire, but they're not off the ground yet.

Jono Adams: [Unclear].

Male: Yeah, I can see you've put your heart and soul into this, guys, and I think that's very noble of you. My contention is with the Environment Agency, because I think they're misleading you and everybody else. I'm currently working on a project in Scotland with a distillery and it's a heat recovery project and it has a payback in the region of two to four years - and it's more likely to be towards two years - and it's five to 10 megawatts. Now, the trouble is, up against what you're telling us there's no financial viability. I think that's why the Environment Agency has a lot of the responsibility of this kind of thing, although it sounds very noble and excites people.

Steve Jarvis: I think I should perhaps clarify the financial position. You did some quick maths there and called me out and I fluffed my lines, so I apologise for that. So we're going to be producing revenue of somewhere between 400 and 500 and operating costs of about 75, so you're looking at 350, if things go well 450, of gross operating profit before we start our annual operating profit. Before we start thinking about depreciation allowances, et cetera, et cetera. That will run for 20 years and also grow in line with inflation.

Our costs shouldn't grow in line with inflation. Once you've got one of these things running, your running costs are limited. So you're looking - over that 20-year lifetime, you know, a decent sort of 7.5 - eight million and potentially, with rising electricity prices, um, 10 million. It's not a two-year payback. I'd loved to invest in that, by the way.

Male: No, but that's why I came here as a potential investor tonight. The figures I've heard put me off, I'm sorry, even though I appreciate you've done a

fabulous job, uh but it's just not worth it. What's the point? I am investing in that, with the distillery.

Steve Jarvis: On a stand-alone basis, um, the financials, uh, are okay. You're looking at about six - eight per cent IRR without a tax break, um, so...

Male: Yeah, but that's at 22 pence per kilowatt hour. I'm talking about a project that's based on eight to 10 pence equivalent. So I mean, that's the problem. Even though I love what you've done and all the effort and all the complexities, I applaud you 150 per cent, if one can use that term, but the truth is it's just not going to stack up. It depends on that 16.5 pence per kilowatt hour to make it any way viable. My concern also is the CapEx. I mean, are these the only people you've gone to? They're very expensive. I know them from [the paper] industry. They are the top end cost-wise.

Steve Jarvis: No.

Male: No?

Steve Jarvis: We are going to open it out to a broad range of potential suppliers.

Brendan Barrow: We've talked to other screw manufacturers.

Steve Jarvis: We've talked to other screw manufacturers, other developers, but at this stage what we want to try and do is get focused on our planning application. Once we have it planning through, we can then think about the technical design and start screwing down the costs and hopefully bring it in way under budget. The last thing an investor would want is, it's going to cost X, oh by the way, sorry, we've run over budget. We would love to come under budget.

We're including our VAT in there, which of course will be coming back. We're including a 15 per cent contingency. The build cost should come in close to about £3.5 million. We're raising £5 million just so that our cash flow is dealt with properly and that we've got a contingency. We hope to goodness we don't have to use it. We hope that we can actually come in below that and produce bigger and better returns. But this is a fair financial return. It's not a standard, um, uh, commercial return. What makes it interesting is the ERS reliefs that will go on top of that Yeah, I mean, your scheme with a two-year payback...

Male: Well, call it two to four, because there are elements...

[Over speaking]

Male: ...but it's probably going to come in around three. But yours is going to come in around - what is it - 15 or something?

Male: It will come in somewhere between 10 to 15.

Male: Yeah, and only because of the 16.5 pence kilowatt hour, which, okay, may be there for 20 years.

Steve Jarvis: But if we consider what subsidies that they have to do, it's to encourage the adoption of a technology and then drive down the costs of that with increased utilisation. That's what happened with solar panels. You got 43 pence to start with. I don't know what the current rate is, but it's come down significantly, because...

Male: You'll never do that with this. This is a high CapEx device. It's not a multiple component device.

Jono Adams: The point is made. I think let's move on. It's a very important point you made, so thank you. Yes?

Female: My main question is you said that the main benefit to the community is shares and reinvestment, but it doesn't sound like you're very confident that you're going to have much to contribute. What happens environmentally and otherwise when you've built it if it doesn't work and it's left there, who's responsible for maintaining it once it's defunct? Who's responsible for - is it the Environmental Agency? Who's responsible for it when/if it doesn't work?

Steve Jarvis: Okay. So I...

Female: How do you justify the main benefits to the community when it's so uncertain?

Male: Uh, I am very confident in my financial forecasts.

Female: It doesn't come across that way.

Male: They're not high. They're not two - three year payback periods. They're...

Female: So why is that...

Male: It's a long term investment.

Jono Adams: The question - sorry, the question which has been made [unclear] on responsibility [unclear]. Who has responsibility for the scheme once it's built?

Male: We have responsibility and we build up a sinking fund, so that when decommissioning is to happen in 40 to 50 years there's a big enough pool .
..

Male: Okay. If Ham Hydro goes bust, who takes the responsibility if the sinking fund's not been funded?

Steve Naylor: When we sign a lease with these guys, it's we - or the landowner - so we will be signing a lease with them to put this on our property, all that will be dealt with as normal - in the normal legal lease. So there will be clauses in there about having a bond and guarantees and being able to pass it on if they fail. So it's all covered in there. It's all in the lease.

Male: The nub of it is they've got the [unclear]...

Male: If they haven't got the...

[Over speaking]

Male: If they haven't got the money it must go back to the Environment Agency.

Female: To who? To who? Who has...

Male: It goes on - yeah, it goes [unclear].

Female: To who?

Steve Naylor: Well, it depends. I mean, it depends who they pass it on to, or whether - it's all wrapped up in the lease.

Female: Yeah. It sounds [unclear].

Male: [Unclear]... already to just answer.

Male: We've just lived through what appeared to be the 60-year threat that, thanks to the EA and the existence of the barrier and the careful management of the threat that was to London, none of our homes got flooded. You're going to put in some kind of cofferdam during the winter at a time when the barrier won't - it won't be an issue to protect, because it won't be a case of water coming upstream on a high tide.

But what if we have the kind of water that - the kind of incident we had in 2001. A couple of sluice gates went out of use because a boat broke free and jammed on them. At that point we were evacuated. We had the police going around every house saying, totally, totally. What happens with your - I appreciate the financial issues that the gentleman who was sitting over there was making. You're on much more of a shoestring than some of these big projects. What happens if, for example, when the cofferdam goes

- or whatever damming structure you're creating - you're putting that in at exactly the wrong time of year for max water flows. What happens if the...

[Over speaking]

Male: Let me finish, please.

[Over speaking]

Jono Adams: Let him finish...

[Over speaking]

Male: What happens when - not if, but when - our homes flood? Who do we sue? You or the EA?

Jono Adams: So just to confirm, the question is regarding during the construction period?

Male: Yes.

Male: How...

[Over speaking]

Male: I think during the construction period, everything - I've looked in detail at your paperwork and I think you've got your modelling wrong. I really do. I think in terms of...

Steve Jarvis: Yeah, I...

[Over speaking]

Male: ...the period of construction is totally short.

Chas Warlow: Well, the period of construction is not during the winter. We...

Male: That's what it said on your slides.

Chas Warlow: Yes, but it's from...

Female: It says from January. January, yes.

Chas Warlow: From January, so partially during the winter, but mainly...

Steve Jarvis: Not during the winter, partially during the winter.

[Over speaking]

Steve Jarvis: But the cofferdam is only there during the summer months and that's a recommendation in...

[Over speaking]

Male: Do you want to go back over your slides? Because that's not what we saw just now.

Steve Jarvis: The construction period is not necessarily through the whole of the cofferdam period. The construction period includes pre-site investigation works as well. So the actual cofferdams will only be there during the summer months.

Male: So can we confirm what the plan is for those cofferdams?

Female: [Unclear].

Male: Safe months would be from May up until September/October wouldn't they?

Steve Jarvis: I mean, regardless of the time period obviously you make a very good point. You don't want that cofferdam there during the winter obviously and that...

Male: January 2015, civil works begin in earnest. So you're going to put this thing in before you put the dam in?

Jono Adams: I think the point that we made, actually the construction period, only part of that is going to be when the dam is. Am I correct?

Brendan Barrow: Yes.

Male: The screws are going to be in March 2015.

Jono Adams: [Unclear] just answer the question. What were you going to say?

Steve Naylor: Yeah, what I was going to say is, regardless of what time of year it's put in, the Environment Agency will require protocols and looks at flood risk, because we can have flood risk on the Thames at any time of the year, as you know.

Male: Sure.

Steve Naylor: So it doesn't matter what time of the year, but obviously during the winter period it's more likely that we will have high flows. So we do try to avoid that period. We would have a protocol in place. Now, there's a number of ways you can design cofferdams. You can provide gated cofferdams. We've got a construction job at the moment up at Molesey that you may be aware of.

Male: Yeah.

Steve Naylor: That's got a gated cofferdam, so if you've got high flows the cofferdam is allowed to flood through and it doesn't provide a blockage to the river. The other alternative is that you design it so that you can pull part of the cofferdam out if it's required, at short notice. So there's a number of ways around that. I mean, we've got - we're doing this all the time on the weirs when we're replacing the weirs. Obviously if you look at the size of the

weir, you're only talking about taking out two small gates on that weir, so the proportion of flow is quite small that we're taking out. But nevertheless we would still require a protocol to be able to restore that to full capacity. So I mean, you're absolutely right, there is that risk.

Male: We were within inches of getting all our homes flooded on that 2001 incident, so that was just two gates that were out of use.

Steve Naylor: Yeah, I mean, and....

Male: The only reason we got away with it is it stopped raining. If it had kept raining at the rate it had been doing, that's it. All our homes would have gone.

Steve Naylor: That's why you have a protocol in place. If there is that situation - and obviously if we're moving [unclear] on that weir and we're getting towards that problem...

Male: My question was - the barb of my question was, if our homes do flood as a result of this and we - and the point I was making was, we've just lived through the 60-year high, so we know it's not an incoming North Sea issue. If this goes ahead and something goes wrong with the construction phase, something is discovered, and let's say the cofferdam is forced to live through a winter and at that point all our homes flood, who do we sue? Because, believe me, I'll be at the head of the queue in the High Court.

Steve Naylor: I'm sure you will, sir. I mean, as I say, if there's a problem, then the cofferdam needs to be removed, and that's...

[Over speaking]

Male: Who do we sue?

[Over speaking]

Female: Or someone dies because you haven't done the health and safety risk assessment properly. Then...

[Over speaking]

Jono Adams: Can you let Steve answer that question? We've only got a few minutes left and I will try and get a few questions then. Just answer that last point.

Steve Jarvis: Okay, so you sue Ham Hydro. Ham Hydro will have public liability insurance.

Male: Do you know how much that will cost you?

Steve Jarvis: Yeah, it's part of the operational costs built into our financial forecasts and as a responsible organisation it's something that we need to have.

Steve Naylor: [Unclear] often that risk is passed to the contractor, who is responsible for putting the cofferdam and removing the cofferdam. So the risk is actually passed to the contractor. If he fails to do what he's required to do, then the risk is with him.

Jono Adams: So we've got a couple of questions here. Anyone else? Over there. That's the last two questions.

Female: Okay. I would just like to ask, when we've got construction going on, how and where are you going to deliver 100 lorry loads of concrete and take away the old structure? There's no apparent access.

Jono Adams: Brendan?

Male: That was my question. Are you going to do it from the river, or from the land?

Brendan Barrow: We're...

Chas Warlow: The river, doing it from the river.

Brendan Barrow: We're likely to do it from the river.

Female: I think it's a very busy river.

Female: How do you do that with so many users on there, safely?

Jono Adams: So, Brendan, do you want to tell - want to [unclear] question [unclear] how are we going to dealing with...

Female: A hundred lorries of concrete during the construction. Where - what access do they have?

Brendan Barrow: All construction will be done from the river. We're bringing - taking rubbish out in barges, bringing everything in by barge.

Female: On a very busy river at Teddington Lock.

Male: It's better them down the river route, I must admit, so that's fine by me. Because I'm going to have to put up with...

Male: There's nowhere in the UK...

[Over speaking]

Female: Also - I would like also [unclear] about the historic part of Teddington Lock, where, as a Royal British Legion life-serving member and a service person and a local candidate for the Conservative Party in the council next year,

this is a very historic part for our veterans for the Dunkirk Little Ships left in [unclear] boatyard and we're going to have a monstrosity that you're intending to plan. The veterans are very, very concerned about this.

Jono Adams: We'd be very keen to talk to the veterans about that. It's a piece [unclear]. Okay, so we're...

Male: You can look at this as a start-up company. But you're a start-up with a very long period to break even. So how will you pay dividends to the shareholders in that period?

Steve Jarvis: Um, we're not a start-up with a long period to break even. So we'll break even almost as soon as we start generating our first unit of electricity.

Male: But that can't be right, surely.

Steve Jarvis: We will take - well, no, because we're not going to instantly pay back the money that we've raised.

Male: No, but that's the bondholders. You're going to have bondholders too, aren't you?

Steve Jarvis: No, we're going to have shareholders. Shareholders for the entirety of the share...

[Over speaking]

Male: Well, what's the two to 2.5 per cent interest rate?

Steve Jarvis: That - so that is the return that the community shareholders will achieve on their investments. That will grow in line with inflation.

Male: But you were saying - but, hang on, you were saying about 8.5 per cent return. I'm confused now.

Steve Jarvis: Over its lifetime, that two to three per cent return will grow, because we're expecting inflation to grow and we're expecting electricity sale price to grow. So if you compound out, by the time you get to...

Male: Until the guarantee period, then it stops.

Steve Jarvis: Yeah, for the 20-year period. Then at that point we will return - should the investors want to - return their money to them and they'll have achieved those dividends in the meantime. The compounding effect of that, including the tax break, equates to 8.5 per cent. So it starts in year 2, not year 1, because year 1 is the construction period. So you rightly point out that we'll run losses. It's not - we'll take on costs to build. It's not necessarily a loss.

But in year 2 we'll generate electricity, probably only half a year's worth, so we'll pay a small level figure, and that's where the range comes in. But then from year 3 onwards we will pay that rate of interest. It's called interest because of the way that it's structured. It's an industrial and provident society. I think of it like a dividend, but it's called interest and it's taxed as interest, and that's the way the whole piece will be set up.

Male: So you've used the word shares. I understand this, so it's not shares in the usual sense?

Steve Jarvis: They're cooperative shares, so one member, one vote.

Male: But not shares on the market?

Steve Jarvis: No, they're not traded on any exchange.

Male: They couldn't be tradable.

Steve Jarvis: I probably should have been clearer about that. I apologise. So they're very much a long term investment and you can only sell them back to Ham Hydro. You can't pass them on to anyone. You can pass them on to your children, but you can't pass them on to anyone else.

Male: There is presumably a period at first when you can't sell them back?

Steve Jarvis: There is a period of three years where we will not be doing any share repurchases, but then from year 3 onwards we aim to buy back three per cent of the share capital each year. So if everyone says, hey, can I have my money back? That's not going to be possible. But if three per cent of the people say, can I have my money back? They will be able to have their money back.

Male: Thank you.

Jono Adams: Okay. I'm afraid we've run out of time for questions. I'm sorry.

Female: Can I just ask one more question? One - and I'm...

Jono Adams: I'm sorry. It's five past nine, and [unclear] has told me we need to be out by nine. So...

Female: Okay. I just wanted to know how much capital you've actually raised so far for this project.

Jono Adams: Right.

Female: I would like an answer, please.

Steve Jarvis: Sure. So the amount of capital we've raised is umm - in equity capital is £8000. You can add £38,000 in loans and we have £27,000 worth of loans

from well-wishers and sort of, people who want to see the project going. But what we desperately need now is to raise some proper finance and open up a share issue and um, ...

Female: Good luck. I won't be investing.

Jono Adams: In terms of questions and further engagement, we will certainly be advertising to have another version of this, probably somewhere in a slightly different location, to [gain] representative of the communities. We've taken all your questions on board and we will consider those. Please go to our website to see an update as we start to respond to those questions. And um, thank you very much. This must be the first public meeting you've been to where you've got a choir in the background, it hasn't happened so far.

[Applause]

Steve Jarvis: Please feel free to leave your email address if you want to hear more about it as and when we're producing more information.

[Background discussion]

END OF TRANSCRIPT