

Jon Spooner: [00:00](#) Hello and welcome to Live from The Space Shed, a podcast all about space and science hosted by me, Jon Spooner and me

Mini Jon: [00:10](#) You mean me.

Jon Spooner: [00:10](#) Sorry. Yeah, I mean you.

Mini Jon: [00:11](#) Mini Jon!

Jon Spooner: [00:11](#) Mini Jon! Long story short, a few years ago, I accidentally set up my own space agency based out of the shed at the bottom of my garden. Turns out that if you go around telling people you're the Director of Human Space Flight Operations for the Unlimited Space Agency wearing an orange space suit. More people than you might think want to play along. And now the British astronaut, Tim Peake is our patron and he took me with him to space.

Mini Jon: [00:36](#) He took \*me\* with him to space

Jon Spooner: [00:38](#) Yeah. Yeah. Alright. He took you with him to space. So Mini Jon became UNSA's first astronaut.

Mini Jon: [00:45](#) Woohoo!

Jon Spooner: [00:45](#) Since then we've been touring in UNSA's mobile headquarters The Space Shed to festivals like Latitude and Blue Dot telling stories, talking to some super cool space and science people, and we've recorded our chats so you can find out about their amazing work as well.

Mini Jon: [01:02](#) [shouting protest chants]

Jon Spooner: [01:08](#) Ah, you're practicing for the protest ey Mini Jon.

Mini Jon: [01:12](#) Yeah!

Jon Spooner: [01:12](#) Mini Jon and I are joining in with the global climate strike this week.

Mini Jon: [01:17](#) Action not hope!

Jon Spooner: [01:17](#) Throughout 2019 thousands, millions of young people across the world have been walking out of school and college every Friday taking to the streets to demand an end to the age of fossil fuels led by the amazing Greta Thunberg, and this September, they're asking adults to join them. Friday 20th of

September 2019. You can find out how to join in at [globalclimatestrike.net](http://globalclimatestrike.net), that's [globalclimatestrike.net](http://globalclimatestrike.net).

- Mini Jon: [01:48](#) Be more Greta!
- Jon Spooner: [01:48](#) Mini Jon is quite fired up.
- Mini Jon: [01:51](#) [shouting protest chants]
- Jon Spooner: [01:54](#) This week in Live from The Space Shed I'm chatting with the wonderful Chaitanya Kumar, a senior policy advisor with Green Alliance. Basically, he tries to persuade governments to pass laws that will help us to stop the worst effects of climate change.
- Mini Jon: [02:09](#) Chaitanya sounds cool!
- Jon Spooner: [02:09](#) Yeah, Chaitanya is cool, MJ.
- Mini Jon: [02:13](#) Let's go!
- Jon Spooner: [02:13](#) Yeah, let's go! Enjoy this week's episode of Live from The Space Shed with climate activist, Chaitanya Kumar.
- Jon Spooner: [02:33](#) Wahey! Hello the Great Exhibition Road Festival. My name is Jon, Jon Spooner. I am the Director of Human Space Flight Operations here at the Unlimited Space Agency. Welcome to UNSA HQ, The Space Shed. Give it up for The Space Shed [audience cheer]. Who thought it was going to take off? Just one of me. Okay. Good. Not, not so convinced. We need a bit more optimism in the world right now. Who thinks I can make this take off? [audience cheer] Yeah. Okay. We're getting there. Hey listen, it's a beautiful day. Thank you so much for coming down, coming out and sharing a part of today with us. We've got a couple of things happening today. Later today at 2.30, I'm gonna be back opening the Shed again and I'm going to be telling a story about how to save the planet if anyone's interested in that. And then later today again at 4.00 we'll have Andrew Smith, the author wrote my favourite book about the Apollo moon landings, Moon Dust. I'm gonna be answering questions about space, Apollo, anything that you want to uh, know about there. But one of my favourite things about my job is I get to meet loads of really interesting people, and this summer we are on a big push, uh, trying to improve the conversation around climate change, climate breakdown, the climate crisis that we are all facing as a civilization. So I'm delighted to have joining me in the Shed this afternoon,

someone who works a senior level with Green Alliance, we'll find out more about what that is, would you please give a massive, Great Exhibition Road Festival welcome to Chaitanya Kumar!

- Chaitanya Kumar: [04:11](#) I've never had that kind of reception before.
- Jon Spooner: [04:14](#) Chaitanya!
- Chaitanya Kumar: [04:14](#) Good to meet you.
- Jon Spooner: [04:15](#) Hi. Come in. Welcome to The Space Shed. Ah, thank you. Bringing water, bringing gifts. Chaitanya, hi.
- Chaitanya Kumar: [04:28](#) Hello.
- Jon Spooner: [04:28](#) Uh, you've cycled here today, haven't you?
- Chaitanya Kumar: [04:30](#) I have.
- Jon Spooner: [04:30](#) Yeah, all the way from...
- Chaitanya Kumar: [04:33](#) Bethnal Green.
- Jon Spooner: [04:33](#) Bethnal Green.
- Chaitanya Kumar: [04:34](#) Not that far.
- Jon Spooner: [04:35](#) I know right, on a day like today, that is a commitment cause you could have used any other form of transport.
- Chaitanya Kumar: [04:40](#) It's true. It's too hot in the tube.
- Jon Spooner: [04:42](#) Chaitanya, I've just described you as, you are, your job title is, you're a senior policy advisor with Green Alliance.
- Chaitanya Kumar: [04:48](#) Yes.
- Jon Spooner: [04:49](#) Sounds fancy. Um, can you tell us a little bit about-
- Chaitanya Kumar: [04:53](#) Sure.
- Jon Spooner: [04:53](#) What that is and what you do?
- Chaitanya Kumar: [04:55](#) Sure. So uh, Green Alliance is a small charity. It's a Think Tank. That's the fancy technical term. My job is basically to think about UK's energy and climate policy. So how do we basically

get this government, this country, to go faster when it comes to addressing this huge problem of climate change. We're doing far better than a lot of other countries, but we can do so much more given the kind of impact we've had over centuries. So, that's my job. So we are trying to engage government policymakers, civil servants, ministers, and try and push for more ambitious policy on climate.

Jon Spooner: [05:32](#)

Which is a great job, right? Just want to quickly cover in case anyone is uncertain about, it's a huge problem, climate change. Why is it a huge problem right now?

Chaitanya Kumar: [05:45](#)

[Laughs] We've known about this problem from a, from a sort of scientific lens for about 35 odd years. I think the known sort of moment, let's say, when most people think we started thinking about climate change is when James Hanson, who is a scientist with NASA, your competitor [laughs].

Jon Spooner: [06:04](#)

One of the other space agencies.

Chaitanya Kumar: [06:06](#)

One of the other space agencies basically went in front of a bunch of senators and congressman in the US and spoke about climate change, and the fact that he noticed that as and when we put more and more carbon dioxide in the atmosphere, the temperature of the surface of the earth was rising higher and higher. And the case in point is what we are experiencing now. I haven't been in this country for long. It's about what, four years now? And we're already seeing heatwaves, which from what I gather from people I have spoken to who lived all their lives here, is quite unusual. If you've been to Italy or France or sort of Southern Europe in the last a week or so, you're seeing incredibly warm, incredibly hot temperatures, a friend of mine messaged saying it was 48 in parts of Italy, 48 is unheard of. I grew up in Southern India, in a city called Hyderabad, temperatures of 48 are what we are experiencing these days, and obviously that is incredibly hot, but some of us have the luxury of air conditioning that we can retreat into, which what it does obviously is sucks the water work coolness that's in the atmosphere and gives it to you, and pumping out more hot air outside. So the unfortunate thing with air conditioning, it's adding to the problem of global warming, which is the worst thing, sort of, you need right now. But going back to your question, yes it is. Heatwaves is one example. We've seen flooding, we've seen drought. We're seeing uh, I don't want to depress so many lovely kids around, but uh, it is, it is a growing challenge and it is all pervasive. So it impacts humanity as a whole, not just people in Britain, not people in India.

- Jon Spooner: [07:45](#) And I think, I know that what we are saying is, and because people come to a festival, it's a nice day out, there isn't a conversation about it. I'm- personal opinion is that we need a better, more public conversation around that so it becomes less scary. So it's not a surprise, it shouldn't be a surprise to us and that then at least by talking about it, we can begin to address it and also feel better ourselves about that. That that slightly uncomfortable thing is better, for my money, than ignoring it.
- Chaitanya Kumar: [08:11](#) Absolutely.
- Jon Spooner: [08:11](#) Because the consequences are quite extreme. And like you were saying, let's, let's make a little upbeat kicker. Like you were saying, we're actually pretty good in the UK at addressing that issue. What have we already done in the UK as an example of good practice for that?
- Chaitanya Kumar: [08:24](#) Sure. Um, so like I said, I work on policy and so one of the things that we pushed for quite aggressively in the UK and something the government has done is put more solar and wind energy. It is renewable, i.e. we'll never run out of sun or wind, definitely not in sort of millions of years. So tapping that energy and converting that energy into something that we can use instead of burning petrol or diesel or other forms of fossil fuels, like coal is something that we have done quite effectively. I'll give you a simple example. In 2012 in the UK, about 40% of our electricity, everything that powers your light bulbs, to your washing machines, all of that, 40% of that electricity used to come from one of the dirtiest forms of energy, coal. But now it's less than 5% so within a period of six years, we've removed a very dirty form of fuel and inserted clean wind and solar. How many of us know about that? Not many because it's happening out of sight and therefore it's out of mind in a lot of ways. It's happening in offshore, in the- off the coast of Norfolk, off the coast of Scotland, off the coast of Ireland, what have you. So it's happening out of sight and we're not seeing it, but in a sense it's good that we are getting a lot of our electricity from cleaner sources deep.
- Jon Spooner: [09:46](#) Do you mind me? Yeah. So we had Jenny Nelson in, Professor Jenny Nelson, professor of physics from Imperial in the Shed yesterday and she was, she works at the leading edge of developing solar technology and like you, she says, 'you know, we don't run out of sun, we've got loads of sun we should be using that'. Makes all sorts of sense.
- Chaitanya Kumar: [10:00](#) Absolutely.

Jon Spooner: [10:01](#) Um, but also that we need to change how we use energy. So that thing about you saying it happens out of sight and out of mind, but we're still using a huge amount of energy that we probably shouldn't.

Chaitanya Kumar: [10:12](#) Yeah, exactly. Yeah.

Jon Spooner: [10:13](#) I'm going to move on if it's alright.

Chaitanya Kumar: [10:15](#) Sure. Yeah.

Jon Spooner: [10:16](#) Because there's a big question for me and I think for lots of people, what can the individual really do to help in this? And we have a, you have an interesting opinion on the role of the individual.

Chaitanya Kumar: [10:28](#) It's a very important question. I mean, I've been working in the sector for about 12 years now. Not long compared to some of my colleagues that I hang out with, but this is a question that's recurring, like what can an individual do as opposed to what system in some sense or the government or corporations can do. And I started off with the idea of individuals having to sort of take the onus on themselves and trying to change whatever they can in their lives. I use more- reduce their energy consumption, use better appliances, energy efficient appliances, which we do these days wherever possible. Take public transport or walk to work if possible. You know, if you're commuting from Oxford to London for work, obviously that's not possible, but that's where I was at about 10 years ago, so, and I've quite significantly shifted my view since then, largely because the problem is getting bigger and bigger and bigger. The shocking fact is in the 30 years, I guess as I said earlier, of 30 years at the time that we've known this problem is when we have actually contributed the most to this problem by burning more dirty energy, which is, there's some dissonance, right, where we know about the problem, we knew about the problem for 30 years and it's exactly in that very period where we caused the most damage to the environment as well, which makes me think it's less and less to do with individuals being able to sort of do more in collectively tackling this challenge, which I'm not saying it's zero, it's important, but I think the problem has become so big, that's why you need governments and corporations to actually do a lot more than they are at this point. And that's one of the reasons why, personally, I've moved from a space where I was advocating for that kind of change, to working on policy with Green Alliance where I think influencing governments, pushing them to put more ambitious policy in place is what is needed. And so an example there is, as soon as I

walked into this park, what caught my eye was the hydrogen vehicle that's being displayed there. Maybe some of you have seen it, but we are seeing a lot of electric vehicles in this country these days and it is going to grow tremendously big. And that is happening because of policy, that is happening because governments are saying 'enough of these fuels that are polluting children's lungs with nitrogen oxides, with all sorts of harmful pollutants in the environment, London being one of them, how do we sort of get them off?' And the worst source of that problem are cars and vans, so moving away from that will not necessarily mean everybody just gets up and says, 'you know what, fine, I'm just going to decide not to use a petrol and diesel car. I'll start driving an electric car'. Can't happen overnight. So you need policy to try to push corporations to manufacture more of these cleaner cars. So you and I can have an option to actually move the mode of transport and public transport as well. So I'm increasingly convinced that companies and corporations and, and governments have to do a lot more. So what does that mean for you and I, and for young people here? Is how do you put pressure on those in power to actually try and make them take the right decisions? Uh, it sounds very political, it sounds very activisty, but that's where we are at. Uh, I'm sorry to say, but that's what we need, so you know, this is a democracy. You can reach out to your MP, you can reach out to your councillors, you can reach out to people who are administrating all of these things around you and try and push them to talk more about climate change or understand the implications of climate change, and really try and put in place solutions that can address that, right at the local level, in places like Kensington and Chelsea and other parts of the town as well.

Jon Spooner: [14:07](#)

We spoke to a four year old girl this morning who had an idea saying she thinks that car adverts shouldn't be allowed, bit like cigarette adverts-

Chaitanya Kumar: [14:16](#)

Great idea

Jon Spooner: [14:16](#)

-they shouldn't be there as a lifestyle choice for fossil fuel burning. I thought that's a good idea, sounds sensible. [audience: inaudible] 14? No this was another girl, four year old girl, tiny little girl. That's what really struck me. Uh, she was also saying that there should be signs at petrol stations about how harmful, if you fill up your car with this, you are putting nitrogen oxide in your- like cigarettes. I was like it's a really good idea but how do we make that happen, really? Because you were just saying about contacting your MP. It's like really weirdly, I did when I was out on my Astronaut Delivery Vehicle yesterday on Exhibition Road run into Emma who is the MP for Kensington

and Chelsea on the street. Yes. She wanted a selfie. Now not everybody is going to be wearing an orange space suit and attracting their local MP to them whilst out on their Astronaut Delivery Vehicle. Does anyone know about the website They Work For You? theyworkforyou.com? But you see what they've done there right? They work for you, they do. They literally work for you. And even though some of you don't have a vote, which is, and I do think you should have the vote because it's your future after all, but you can still write to them and find out really easily who they are, theyworkforyou.com. right? And that's, that's one way to do it, write to your MPs.

- Chaitanya Kumar: [15:29](#) That's one way of doing it. We organised a, what is called a mass lobby, uh, last Wednesday, about 12,000 people. People like yourself, from different, all the constituencies in, uh, the UK came down to parliament and lobbied their MP talking about climate change, you know. We've seen climate change become mainstream in some sense in the public conversation, thanks to Extinction Rebellion and school strikes. Um, and that needs to continue. And what's striking with what you've just said, a four year old thing that.
- Jon Spooner: [15:59](#) Mmm.
- Chaitanya Kumar: [16:00](#) And it both inspires me and also saddens me in some sense that they have to think of, of that, that that's what it's come to. Why can't we actually think of those policies, think of those ideas, cause we don't seem to get how, how grave the situation is. Um, and they will live through that, as much as I hate thinking about it, but that's, that's the kind of world we're setting them, sort of setting up for them, which shouldn't be the case. So sooner the adults sort of get up, get their act together, the better.
- Jon Spooner: [16:32](#) So in amongst all the doom and the gloom, which you know, there is a scenario which is really doomy and gloomy. That's just how, that's just the reality if we don't act now and do something. There is still time to really make positive change. There's been a recent announcement from our government that they're going to aim for, correct me if I'm wrong, for net zero carbon society by 2050. So that, there is a huge challenge in doing that.
- Chaitanya Kumar: [16:57](#) Yeah.
- Jon Spooner: [16:58](#) But what is the positive vision, if we can do that?



Chaitanya Kumar:

[17:01](#)

Absolutely. So UK has as legislated for a bold target, which is by 2050, there will not be any surplus emissions, carbon dioxide that is in this case, or methane for example, which is another global warming causing pollutant. There won't be a net positive emission of these gases by 2050, right? And that is a significant shift. Right now we emit about 500 million tons of it in this country. From 500, we've got to jump to zero in about 31 years time. That is quite a shift. Um, and that, it's important sort of not think about it as 'oh my god, that's daunting, that's impossible. How do we do it? What might it mean for you and me living in this country?' But the idea is, sort of in some sense, give it a positive spin. You will be living in a much healthier environment than you are today. You will be living in an environment where there's much less carbon pollution, much less nitrogen pollution, much less particular matters in the atmosphere because there won't be any fossil fuel cars running around, as in they won't be anything coming out of the exhausts of vehicles anymore. They might be electric vehicles, they might be buses, there'd be more public transport, running on electricity, things like that. You will be in a situation where you will have a lot more forest, in this country than we have. I enjoy the countryside in this country, but you will see a lot more of forests come up. Why? Because you need them to actually suck the carbon from the atmosphere and store it in, in them. So you will see a lot of that coming. This is all assuming that we, we achieve that and I hope we do achieve that. But if you do, there's a massive prize at the end of it and through the process. Forest is another one. Cleaner water, cleaner rivers, you will see a lot more biodiversity come back, right. Not many of our kids here sort of, you know, get to look at badgers or all sorts of other animals out there because you have to go to the countryside to try and see. But if you enhance the forest landscape in this country, you are introducing or allowing nature to sort of take control, allowing nature to sort of introduce a species and, and give them a nurturing space. And we will see a lot of that for all of us to enjoy. So, there's a fantastic prize at the end of it. There's a fantastic opportunity for our kids to grow into, into that world. Uh, which isn't as depressing as, as how we started this conversation about the, the harmful effects of climate change. So, that's the goal. I think we can work towards that, but you need to push governments and corporations.

Jon Spooner:

[19:40](#)

And it is achievable, right?

Chaitanya Kumar:

[19:42](#)

It is.

- Jon Spooner: [19:42](#) It is. We talk, we've been talking this weekend a lot about, it's the 50th anniversary of the moon landings this year, which at the time when Kennedy announced that idea, literally no one else in the world believed that it was possible. But because of the investments and bringing everyone together to focus on it, the clarity of the focus on that, they did it. Something, they did it in seven, five years. They did it within five years. Something that when they started thought was impossible. Cause I think there's a lot of talk about this is impossible to achieve, it's hopeless. It's not, but it does require all of us, I think, to get involved and to really be making this conversation the first, the most important conversation.
- Chaitanya Kumar: [20:18](#) Going back to individual action again, like one stat that sort of boggles my mind is we waste or throw away about seven and a half million tons of food waste in this country and about 60% of that doesn't have to be thrown away. It's just like an apple that's bendy, or like something that doesn't look right, which is sort of no, chuck it away. Not because you and I don't want to eat that, but because there's a perception that you and I wouldn't want to eat that, there a perception that supermarkets and others have assumed that the consumer doesn't like that, will not buy it, and therefore we're not going to provide that. So when a massive supply, bulk supply, comes from Chile or Argentina or Kenya in terms of vegetables and fruits, you look at them and you go sort of no, that doesn't look, that has a little spot on this, doesn't look- So they're throwing incredible amounts of food waste. That's one thing that we could do, like try and not throw away food waste.
- Jon Spooner: [21:11](#) One of my favourite things I saw in Morrisons little while back, they had, they were cheaper, they were wind blown apples. They were apples that had just fallen out of the tree of their own accord naturally, but because they were a bit odd looking, they were cheaper. But I love that they're 'wind blown'. These aren't ordinary apples... Chaitanya is here. We have an opportunity now for you- oh I was going to say in terms of- it isn't hopeless, there's lots of things we can do. We have made a little website for you if you wanted to do things. It's got really easy things you can do right now, right today. Things you could do in a month, things you could do in a year, things you could do if you wanted to dedicate your life to fighting climate breakdown. It's got lots of ideas, starter ideas including some that Chaitanya has contributed to that. So we've had all of our experts come in and contribute to that, so there's really meaningful things. But this is your opportunity. If you have any questions for someone who works at the most senior level of policy on climate that has all of, or answers to many of the

questions that you might have now is your opportunity.  
Gentleman at the front here

- Audience: [22:12](#) I was wondering about the feasibility of capturing carbon even more effectively per square meter than planting trees. I'd be quite interested to buy some agricultural land and commit it to that use if it were feasible, and if it were incentivised in the right way.
- Chaitanya Kumar: [22:27](#) Yeah. Um, so I think this is where I bring the B word, Brexit. Um, what we do these days under the EU is we incentivise a lot of farmers across the UK just to farm. Um, and it can have some negative implications in terms of greenhouse gases and agriculture is roughly 10% of our carbon emissions or global warming potential in the UK. The incentives that we're talking about is once if you're out, once we're out, whatever it is, if we can change those policies, what we can do is the 3 billion pounds that we actually allocate to farmers could be repurposed and incentivised to actually do something else, what is called environmental land management. I don't want to get into the geekiness but the idea is how do you use agricultural land for purposes of sucking the carbon out of the atmosphere and putting it in the ground for a long time to come. It is doable. It's good, but right now it's not incentivised and under the current system it's very difficult unless you have some major countries in the EU reforming the system, which there is no incentive right now, but once the, once we are out then the current minister at least who won't be there for long, but the current minister at least, Michael Gove has indicated that he's very interested in doing exactly that, incentivising these farmers actually-
- Audience: [23:44](#) If the incentives were there, is the science there that you could economically get stuff to the farmers that could do that?
- Chaitanya Kumar: [23:51](#) Not conclusive. It's like, technically it's possible, but we haven't done it at that scale to show that that it's feasible or not, but that's a good question [inaudible].
- Jon Spooner: [23:59](#) And there's something about an attitude shift as well. It's not just whether or not it's feasible, it's worth trying and just the shift in going it's not always about making an economic case for it, I guess. Otherwise what happens if we don't? Well we'll probably all burn to death. That makes the case for it for me. Yeah. We had a six year old boy in the audience yesterday talking about, one of the things he's doing was he set up a business with his school last week where he's making and then selling seed bombs. So just that idea of rewilding your own

environment, your gardens as well. And I liked that that was just a thing that was happening.

- Chaitanya Kumar: [24:35](#) Yeah. Yeah. And as you can see, there's no cars around. There's no fear of something hitting here. This is running around, ideally-
- Jon Spooner: [24:42](#) Apart from me.
- Chaitanya Kumar: [24:42](#) it's odd to be [laughs]. But that's as a result to be like, you know, something fantastic happens when you just take the cars out of the equation and just let people occupy a space. All sorts of creativity comes into that space and they make it their own. But once you remove that and cars dominate the space and something else dominates the space, then yeah, you're siloing people putting them saying this is your space, this little enclave of park. And that's it, that's, that's where you can have close to nature as you can, but we'd like to see it everywhere.
- Jon Spooner: [25:15](#) Everywhere. I agree. It'd be lovely. Hi,
- Audience: [25:18](#) Hi. Simple question, how do you see us heating our homes in the future? We're very dependent on gas boilers. I've got a gas boiler.
- Chaitanya Kumar: [25:27](#) Yeah.
- Audience: [25:27](#) Is it going to be mandatory, well obviously we have to do to go carbon free?
- Chaitanya Kumar: [25:31](#) Yeah.
- Audience: [25:32](#) Net carbon free.
- Chaitanya Kumar: [25:33](#) About 26 million homes have boilers within them and so it's a massive challenge. I have a boiler at home as well. The three things that most people talk about. One is electrification. That's uh, take your boiler out, put a what, what is called a heat pump. Just like an air conditioning, uh, conditioner, sorry. Um, that's the opposite of it. Like heat your house, but these days, given this, you might need a bit of both, but heat pumps are one of them. Why do I say heat pumps? If you remove gas and put an electric machine in there, you're obviously just shifting gas demand and putting electricity instead, so you're still consuming electricity. But if you can clean up where the electricity's coming from, then it's a net positive in that sense. That's one. The second is, this is quite bold and very tech,

technology intensive, which is changing the gas supply and replacing that with hydrogen. Hydrogen is cleaner. It definitely has much less carbon emissions associated with that, but that takes a whole set of infrastructure to be created for that, which is a huge task with billions of pounds to be invested. The government's already thinking about it. We're already trialing some of that up north in Leeds, and a couple of other places. We're blending gas and hydrogen in some places just to see how it works. We're doing all sorts of things, but hydrogen is another, and what is called district heating. Um, the idea is that you have a mass boiler in one place. Instead of having different individual boilers across the homes, you have mass point of communal boarders for an entire district in some sense, and you make sure that that boiler is clean, cleaned up and coming from a clean source. On top of all of these solutions. There's one thing that definitely needs to happen, is energy efficiency. Yeah. You just have to make sure that all these buildings around are not leaky. The UK is called the cold man of Europe because we've got one of the leakiest- leaking, I mean like heat leaks from the house and then you turn the radiator on, most of it is lost through leaks in the house. What's the point, you're just using more and more? So the draftiest, leakiest homes in the country so that has to be fixed. So if you reduce the amount of energy you need, then you reduce the amount of gas you consume and it's easy to sort of convert that gas to a cleaner form [inaudible]. So yeah.

- Jon Spooner: [27:57](#) Could I answer? A couple of things if it's all right to add as well, like really direct things that you can do very quick. Insulate your home. I mean that is-
- Chaitanya Kumar: [28:04](#) Yeah.
- Jon Spooner: [28:04](#) -it's a, it's a no brainer for everyone. You can change your electric, your energy provider right now really easily. We, we're going around just recommending everyone, do Ecotricity because they have 100% renewable sources for their electricity. It's frack-free gas. They're looking at the alternatives to gas. We've also had people suggesting really realistically, um, and again it's on the website, howtosavethe.earth, community wind and solar farms. So I'm genuinely looking at how on my road I get together with my neighbours to look at how could we really efficiently share the energy production in our roads so that we could then go off grid. And these things are already happening. They're happening in schools, they're happening in community projects, they're funded by lots of places. So there are really meaningful things that you can actively do yourself as well, yeah.

Chaitanya Kumar: [28:49](#) Just one more thing. How many of you have solar panels on their rooftops? One. Cool. So another thing people are trying these days is a combination of insulation plus heat pump plus solar panels on the roof top. And the idea is as a combination, you basically reduce demand, putting a heat pump, and electricity for the heat pump comes from the solar panel. So technically you reduce the dependence on the grid from the outside so much that you, potentially can be self sufficient on a day like this, because you're not heating your house because it's too hot. Right? And what other appliances are there, are being run by solar panels. You don't have to depend on the system to give you- So if you start moving towards that, more and more people can actually feel like, you know what, I'm not having to depend on the system. I can produce my own electricity.

Jon Spooner: [29:40](#) And by more of us doing it as well, it shows the system that the demand for the other thing isn't there anymore. So they will look to invest. Thank you very much Chaitanya, that was a good one. Uh, anyone else got question for Chaitanya? Gentleman in the middle. All the, all the adults today.

Audience: [29:56](#) Is it true if we don't fix the system or the problem, we hit a temperature when the planet goes into thermal runaway? Is that true?

Chaitanya Kumar: [30:03](#) Yeah. Sorry. [laughter] Um, where, where the tipping point is, isn't clear. It's not a set mark, marker in the ground, but the range is anywhere between 450 and 500 parts per million of carbon dioxide in the atmosphere, or greenhouse gases. We are right now at 414, 415. So once you start hitting 450 and beyond, then it's, you're in sort of big trouble. We are adding about three parts per million every year. So from 415 to 430 is what...

Audience: [30:38](#) Dangerously [inaudible].

Chaitanya Kumar: [30:38](#) [inaudible]

Jon Spooner: [30:40](#) Particularly with this weekend, the G20 summit ending, the Paris agreement, which no one's formally or illegally committed to, but all of the 19 of the G20 countries agreed to stick to those guidelines for the Paris agreement, apart from one, which was of course president Trump. If you have any American friends, in order to literally save the planet, they have to vote for so- anyone else, at the next American election. Who's got an American friend? Who's American? [laughs] Hi. Please, you know, for all of us. That's the active part there, let's, let's not allow that to happen for another four years. We're really- yeah, time for one more.

Audience: [31:20](#) Why was that the first time we've heard that-

Jon Spooner: [31:24](#) Hang on, this is a really good question.

Audience: [31:24](#) Just what you just said was really, really powerful about giving us a number of- and we've talked about one and a half degrees, we have to avoid that, but actually talking about it in parts per million in a carbon dioxide concentration was really, really powerful. We were kind of 'wow' and it's going up, trickling up, and if you could see that...

Jon Spooner: [31:44](#) And your question was why haven't I heard that before?

Audience: [31:47](#) Why was that the first time!

Jon Spooner: [31:47](#) It's a really good question.

Audience: [31:48](#) Because that was the best thing I've ever heard-

Jon Spooner: [31:50](#) Chaitanya?

Audience: [31:50](#) -in terms of convincing people.

Chaitanya Kumar: [31:52](#) It's funny, I used to work with an organisation for about five years called 350.org that's name of the, 350 is the parts per million concentration that is safe and sustainable. Most of my ex colleagues who were there got themselves tattooed with the number-

Jon Spooner: [32:09](#) I'll have that.

Chaitanya Kumar: [32:09](#) -parts per million of carbon dioxide at the time of their birth. Um, so I have a friend who is 387, another one who's like 360, something like that. So it's just an indication of how quickly things have changed. Uh, 387 wasn't that when I, uh, was born, it was 387 and now, 380 I think. And now it's about 414, so it's growing rapidly and I think between 450 and 500 is what most people think will be a runaway climate change.

Jon Spooner: [32:41](#) I would say in answer to your question, that it's because it's not, it's not a conversation that we're having. It's why it's surprising to peo- it's why it's uncomfortable for people to have that conversation. There was a recent audit at BAFTA. They, through their audit, discovered that climate change is featured less often in dramas, ongoing serials or dramas than rhubarb. And 20 times less than the B word. And that is why it's the first time you're hearing about this because in EastEnders, it's mad to me

that it wouldn't be part of that conversation or you know, the pubs in those soap operas that someone isn't going, 'do you hear about that thing? The, uh, maybe the world is gonna burn in about 30 years if we don't do something about it?' That's never a conversation you hear on any of those programs, and I would say that's a big part and yeah.

- Chaitanya Kumar: [33:29](#) One final thing is I remember listening to the today program on Radio 4 during the Extinction Rebellion protests that were happening and some of the people who are participating in them, talking to the, the radio presenter. And one thing that really struck me is, is for a lot of these people, now it's become emotional now it's become personal in a lot of ways, it's not about some hypothetical climate change happening abstractly, it's about them. Like that individual who was talking on the radio, it was like, 'I've got a four year old daughter, like, I worry about their future'. It can be very emotional, very personal, and I think a lot of us are feeling that and thinking that, and thinking about, and responding to that at a very sort of gut emotional level. I'm keen on taking that and translating into policy that'll really drive ambition because we need to, we need to push harder than we are at this moment and hopefully our collective, um, sort of emotional push can also translate into policy and vision.
- Jon Spooner: [34:30](#) I think that's a very excellent, beautiful place to end. It's difficult but there is real hope. Chaitanya, how can anyone stay in touch with you, are you on the social medias?
- Chaitanya Kumar: [34:38](#) I am on social medias. My name's on the white board there and with no space @chaitanyakumar on Twitter is where you can find me.
- Jon Spooner: [34:48](#) You can follow Chaitanya. There, is there any way to get involved.
- Chaitanya Kumar: [34:51](#) I'm geeky and wonky on the policy details but yeah, feel free to message me.
- Jon Spooner: [34:55](#) We're on all the social medias @untheatre, @untheatre, do go and have a look at the howtosavethe.earth website, if you want some ideas on things that you can do. Like I say, get involved, action as well as hope. It sounds bleak. It is a bit scary. That's okay. Good to talk about it, and let's all together do stuff to secure ourselves a decent future. Chaitanya Kumar everybody! [applause] Thank you.



Mini Jon: [35:20](#) [shouting protest chants]

Jon Spooner: [35:20](#) Pretty scary but also hopeful stuff there from Chaitanya. I love the idea that if we make these changes then our future could be an even better place than it is now. It's not all doom and gloom, and if any of you, like us, really want to get involved in helping to save the planet but don't really know what to do, check out the website we've made that includes suggestions from people like just Chaitanya, [howtosavethe.earth](#), [howtosavethe.earth](#). It's got loads of suggestions for things you can do right now, things you can do with a little more effort this week or this year. It's even got tips for you if you want to dedicate your life to fighting climate breakdown, [howtosavethe.earth](#).

Mini Jon: [36:11](#) We need to go and make a placard for the march right now!

Jon Spooner: [36:11](#) Yeah alright MJ, just let me finish up here, then we'll go and make a placard for the march. As always, you can connect with us on any of the social medias. Were at @untheater, that's @untheatre on Twitter, Instagram, and Facebook. And if you're enjoying our podcast, please help us spread the word. Tell everyone you know to subscribe to...

Mini Jon: [36:34](#) Live from The Space Shed!

Jon Spooner: [36:34](#) Live from The Space Shed is an Unlimited Theatre production with season 1 brought to you in association with the Science and Technologies Facilities Council, the Cockcroft Institute, The Space and Arts Council England. With special thanks to Dr Rob Appleby of Manchester University. Our theme music is 'Go!' by Public Service Broadcasting, used with their extremely kind permission. Our sound engineer and editor is Andy Wood with additional sound design by Elena Pena. The show is produced by Jon Spooner, and Alice Massey with support from our friends at Storythings. Live from The Space Shed is an Unlimited Theatre production on behalf of the Unlimited Space Agency.

Jon Spooner: [37:04](#) Don't forget to join in with the global climate strike at [globalclimatestrike.net](#). You can see what they've done there and we'll see you for more.

Mini Jon: [37:14](#) Live from The Space Shed

Jon Spooner: [37:14](#) Live from The Space Shed soon!