

**TRANSCRIPT OF INTERVIEW WITH RUSSELL GEORGE, CEO OF PLANKTOS, ON  
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[Alex Smith, host of Radio Ecoshock]

As the climate crisis threatens to spin out of control, new entrepreneurs are working to find ways to remove the principle greenhouse gas, carbon dioxide, out of the air - and one of these is Russell George, the CEO of Planktos Corporation. We have him with us today, from his head office in Foster City, California.

Welcome to Radio Ecoshock.

[George] Hi there.

[Alex] Hi. Well Russ, can you give us a little bit of your background - how you got interested in environmental solutions?

[George] Well, I'm an environmental science guy by background, and I went to school in classical plant ecology, largely, and shortly after University I ended up living in British Columbia, actually, and started working as a tree planter there, back in the early '70's, and started a tree planting company called Coast Range, and went on, that company went on to plant hundreds of millions of trees across Canada, although it was sold by the partner, myself and the original partners in the mid-90's, I think it is still going today.

Subsequent to that, I've been working on environmental management projects, for both government and industry, both in Canada and the U.S., and around the world.

[Alex] Well, do you have training directly in the oceans field?

[George] Well, you know, I, my University training wasn't in ocean science, but I was, I've always been a sailor. I bought my first sailboat in Vancouver, down in Coal Harbour, back in the 70's. And I was a hard core ocean sailor for many years, and I've been involved in a lot of oceans fisheries projects, with Canadian agencies, for many years, so, typical of a Canadian government environmentalist, you have to wear many hats. And one of the hats I had to wear many times in Canada was an ocean science hat.

[Alex] And did you work for Greenpeace at one point?

[George] I did. At one point in time I was hired by Greenpeace, to try and convince the ship operations people to try and convert the Rainbow Warrior into an ocean research vessel. And, part of my assignment, in order to do that, was I had to go out on a mission with the Rainbow Warrior, and join the crew, and learn how everything worked. So, I've spent my time on night watch at the helm of the old Rainbow Warrior, just before the French blew her up and sank her.

[Alex] Really. Well, I realize that your company name of "Planktos" refers to your company's plans to use plankton to grab CO2 out of the air, but I'd like to start with another company project: planting trees in Hungary. Can you tell us about that?

[George] Well, our Hungarian project that we created is called "KlimaFa" - which means "climate tree" in Hungarian - and, as a matter of fact, I have another project that I'm working on with the Haida Indians in the Queen Charlotte Islands, called the Haida Climate Project. And both of those projects are about growing trees, new forests, for the purpose of sucking carbon dioxide out of the air, that trees are happy to do. And storing that carbon dioxide in those living ecosystems. And in doing so, you earn what's called a "carbon credit" in the world community, these days.

[Alex] I'm sorry, that can become a business then, selling carbon credits?

[George] Sure. Carbon credits are part of the mechanism that the Kyoto Accord set up. And many other jurisdictions, that aren't part of the Kyoto Accord, many of the U.S. States and municipalities are doing this. It's a market-based mechanism to provide an economic motivation for the world to, basically, invent solutions to the climate change issue, to the problem of fossil CO2.

And, so that we can develop technologies that will effectively remove CO2 from the air, or prevent it from going into the air. And forests, and ocean plants, what we call the plankton, the ocean forests, are the only ways that you can really effectively remove CO2 from the atmosphere, once it's there. You know, they work with free solar energy, and they very efficiently scrub CO2 out of the atmosphere and park it in that living ecosystem.

[4:20]

[Alex] Well, your tree planting project got a lot of good publicity lately when the Catholic Church announced it would use KlimaFa to offset the carbon emissions of the Vatican. That's kind of a turn around, isn't it? Usually, it's the Church who forgives other people's sins...

[George] Well, that's right, and we had some friends who knew some people, some officials in the Vatican, and that they were interested in green actions, and in fact they've taken a number of green actions over the past number of years. So, we presented our case to the Vatican, that it might become the first carbon-neutral sovereign state on Earth. Maybe it's the smallest sovereign state on Earth, but it's today, the greenest one.

And they chose to do that through our forest projects that we're planting in Europe. Those forest projects will begin this Fall [2007]. We've already got seedlings in the nurseries in Hungary, and this Fall we'll begin planting those trees in the first 10,000 Hectare project, in the National Park System in Hungary.

Of course, planting trees in a National Park is a good way to guard those trees. So, if you're growing a tree for it's value in storing carbon dioxide safely, away from the

atmosphere, you don't want someone to come in and cut it down, or burn it as firewood, and so the best and safest place in the world to park a tree is inside a European National Park. So, that's what we're doing.

[Alex] And, you have an agreement with someone in Hungary to do this. Are they part of the program, the government there?

[George] Yeah, we established a company, a subsidiary company in Budapest, called KlimaFa, and we have some Hungarian participants in that project. We have agreements with the Hungarian Government. We have contracts with the Hungarian Academy of Sciences to do the technical forest modelling work, on the project, so that we can accurately predict how much carbon dioxide is being absorbed by our forests. And, we have the very famous Sopran [check spelling] School of Forestry, from the Western Hungarian University working with us on prescribing the proper forest planting methods, the tree species, and, you know, where to plant, and what the mixtures should be, and the patterns of trees.

And of course, we have our own professional forestry staff, and we'll be hiring hundreds of workers to go into the fields of Hungary, to restore some of the ... you know, Hungary used to be seventy percent forest, and today, it's seventeen percent forest. So, the government there is eager to restore some of it's forest. And, to do so in this very environmentally sensitive way, where we're restoring a native forest - not for timber this time, but for the benefit of the environment, alone.

[Alex] That does seem some revolutionary. Most planting, as you say, is done by forest companies, and they plan to cut it down again.

[George] Right. And, we all use forest products, so you have to engage in some of that, but for our purpose, we found that the value of a carbon credit, one ton of carbon dioxide, taken from the atmosphere, and re-positioned inside of a living ecosystem, that there's sufficient value in that, that we can now apply pure environmental rationale to this work. So that we don't need to seek any other additional values, like commercial lumber values, or things of that nature.

We can simply plant the forest for the benefit of the environment. And of course, there's many benefits. You know, there's not only carbon taken out of the atmosphere. There's ...forests protect the waterways, they make sure the water runs clear, and with less flooding. It provides habitat, so that you enhance biodiversity, and there's just a plethora of environmental benefits from a forest.

[Alex] How many years does it take before the young trees begin to absorb significant amounts of carbon dioxide?

[George] Well, they begin absorbing carbon dioxide immediately. And, the carbon marketplace, that defines what a carbon credit of one ton of greenhouse gas emission offset credit, how that is defined, is quite variable.

For instance, many wind projects these days, they generate carbon credits because the windmill offsets the use of fossil fuel. So the amount of energy that the windmill produces is equal to so many barrels, or, you know, cubic feet of, cubic meters of natural gas, and that has a carbon dioxide equivalent. But people who build windmills typically account for all of the carbon credit value of the windmill, for the life of the windmill, when they first begin, when they first build it. And they bring some of that value forward.

Just the same as a wheat farmer, who needs to invest in new equipment on his farm, might sell the futures of his wheat production, forward, for quite a number of years, in order to finance the project.

So, we're able to manage carbon credit offsets, carbon offsets, as a commodity. They're a bankable, tradable commodity that has both a spot market price for today, and a futures price. And there are sophisticated financial instruments, that we can manage in exactly the same way that we manage all other commodities in the marketplace.

[9:50]

[Alex] And this tree planting solution, as a way of sequestering carbon, has received quite a boost lately, with a new publication in the Journal "Science", and according to this study, Dr. Renton Righelato, suggests that reforestation is a much better way forward than, say, biofuels. Have you been following that?

[George] Well, we have been following it, and we think that growing green plants is definitely the greener solution to the crisis of fossil fuels. Because when CO<sub>2</sub> is in the atmosphere, the problem that really results is a problem to the living planet. Really, the first parts of the planet to suffer are those plant ecosystems. And they are scalded by the CO<sub>2</sub> in the atmosphere that makes global warming, and they're scalded by the acidification of CO<sub>2</sub> in the ocean - and what better thing to do than to use those very injured parties, those plants, to take that carbon dioxide out of the atmosphere, and heal those ecosystem, those living green ecosystems.

And have that carbon dioxide no longer in the atmosphere where it's causing further harm, but at the same time, it's actually re-growing, and restoring the harm that's been done. So, it's really the greener solution.

[11:10]

[Alex] I agree. Well now, the famous scientist, James Lovelock, and he's backed by the IPCC, is predicting that Europe will be so hot by 2040, that vegetation may change from forests to grasslands, or even desert-like scrub. So let me play you that clip from his recent speech in Adelaide.

[James Lovelock, on Radio Adelaide] Now, I know more about Europe, than Australia, and I think it's intriguing to me, to know that if we take the average of the IPCC report,

which is way below what the observations are suggesting, it tells us that by 2040, just 33 years from now, Europe will look very like Australia.

You may remember there was a very hot summer in 2003 in Europe, when between twenty and thirty thousand people died of heat. In that summer, there was almost total drought, and temperatures somewhere between 40 and 50 Celsius persisting throughout June, July, and August.

That will be the norm, says the IPCC, by 2040. It sounds very much to me like an Australian climate. Now, people will probably manage, if they have enough energy. They'll have air conditioning, and desalinated water, and so on. But growing crops will no longer be going on. We've no possibility, whatever, of Europe by then irrigating the whole of it's continent.

I'm not exaggerating here, when I say that this is somewhat in the middle of the IPCC forecast - not some extreme outlier. And already, in a way, the Sahara Desert is moving up into Europe. Southern Spain, southern Italy, and Greece, are all becoming desert regions, too hot for crops to grow. Too hot, even, for the ubiquitous Olive of southern Europe to grow. So, we have a pretty bad future in front of us."

[end of Lovelock quote, 13:30]

[Alex Smith] We may not have to wait until 2040. Already, there were terrible forest fires as you know in Portugal and Greece this year. And, this summer of 2007 broke heat records all over Eastern Europe, including Hungary. Now given the stability, or rather the instability I should say, of the climate, Russ, when people or institutions buy carbon offsets from your company, can they really count on this forest staying there?

[George] Well they can, in so far as they manage a lot of different risks on their purchases of different commodities, and climate change commodities are one of those instruments that they have to risk manage. So, for instance in the carbon market today, in Europe, the price of a carbon credit, from an instantaneous source, like an engineering source, like you know, capturing some methane that's leaking out of a coal mine, or something of that nature, is about 20 Euros per tonne, is the trading price.

And a forest credit sells for about 70 percent of that price. So, down around 14 Euros per tonne. And the reason that it sells for 30 percent less, is that that 30 percent captures the value of the risk elements in that forest.

So in that this market - this market is a very sophisticated market, and the buyers are very sophisticated buyers. We can very easily manage the risks, the various risks. I mean anything other than the cataclysmic ones like what Lovelock predicts, which ... You know, if Europe becomes like the outback desert of Australia, the last things I think we'll be worried about is whether the carbon credits we bought 30 years previous were the right price, or not.

[Alex] It's true. People may have to move North into Scandinavia or Russia, if that happens.

Well, I'd like to ask you just a little bit more about the HaidaClimate Project. It is closer to home. Haida Guai is a series of very large coastal islands on the Northern BC coast. What can you tell us about this project?

[15:30]

[George] The Haida First Nations people came to me quite a number of years ago, when I was working to develop some carbon climate forest projects in British Columbia, in the temperate rainforest. And they asked me if I would help them set up that kind of ecoforestry, green collar industry on their islands, the Haida Guai.

Because they have chronically high unemployment, now that the wood industry is in great decline, and the fishing industry has - you know, on the islands there, there really is no commercial fishing industry left. There is only the sport fishing industry. And so they were desperate for some way to take over stewardship of those islands, and there's a lot of restoration that needs to be done there. So, we've designed a project that will be able to take advantage of the fantastic growth conditions of the British Columbia temperate rainforest.

You know, the temperate rainforest of BC grows at about four times the biomass of the tropical rainforest, like the Amazon. Few people realize that - that the greatest rainforests on Earth are the temperate rainforests, not the tropical rainforests.

So there's a great project there, that we've been slowly plugging away at. In fact, I spent part of the morning on the telephone with some of the Haida people this morning, setting up project tours with some government officials. To show them the projects that we are planning, so that can get underway.

[17:00]

[Alex] Does it need government approval?

[George] Yes, unfortunately all these projects, or, fortunately, these projects need government approval, because Canada's part of the Kyoto Protocol. So, it's slowly adopting it's measures. It was moving a lot faster before the change of government, and unfortunately things have slowed down. But there is progress forward, to produce this carbon market in Canada, the cap and trade marketplace, to be able to develop carbon projects that sell offsets to the industries that need them - and the individuals that choose to buy them.

The forestry projects, especially the really gem-like projects like the temperate rainforest projects in BC are quite spectacularly beautiful projects in terms of producing an effect.

[18:00]

[Alex] Yes, we'll get a new improved ecosphere out of it.

We are talking with Russell George, the CEO of a company with newsworthy ventures to remove CO2 from the atmosphere to help alleviate climate change.

Let's move on to your more controversial plans to capture CO2 in the oceans, by feeding algae, by your company, Planktos.

Listeners will get a chance to hear clips from your at the Chicago Green Festival last spring, but can you give us a short description of the Planktos project?

[George] Well, the Planktos project is all about taking iron micronutrients, the mineral micronutrient iron that ordinarily comes from dust in the wind. And that dust feeds the distant ocean. You know, dirt from the land - if you look at dirt from anywhere on the planet and it looks red, it's 3 percent iron, iron oxides, typically hematite iron ore. And if it looks tan colored, it's one per cent iron.

The dust from the land is just like the rain from the ocean, in terms of the planetary ecosystem. When rain from the land - from the ocean - rises up into the atmosphere and ends up falling on the dry lands, and deserts of the world, those land ecosystems bloom. And in the same fashion, when dust from the land rises up into the atmosphere, and ends up in the ocean, - and remember this planet Ocean of ours is seventy percent ocean - and so when that dust lands on the ocean, the ocean plants are waiting for that mineral dust, to bloom. And they do.

So, our project is following in the footsteps of 20 years, and over one hundred million dollars worth of institutional research from governments around the world, and we're right at the stage where that institutional research has said "this really does work," but it needs to be tested at a commercial scale.

So, we've set up a series of 6 commercial-scale pilot projects. They are more or less identical to a Stage 3 clinical trial for a new drug. The drug happens to have one patient only: it's poor old Mother Earth. But we're sure it's a blockbuster drug that will heal her ills - and restore her trees and seas.

And that's what Planktos is going to do. It's going to take dust that was formerly blowing in the wind, we're going to take it back to the ocean. It's iron rich dust, and we're going to try and restore and replenish the missing plankton blooms.

[20:30]

[Alex] And, as we've heard, or found out, the algae is greatly reduced from what it used to be according to the satellite measurements, even in the 1980's - is that the case?

[George] Yeah, the ocean plants have been declining at the same rate as the terrestrial rainforests. That's about 1 percent per year. And what that means in real numbers is that the North Atlantic Ocean has lost 17 percent of its plant life in the last 30 years, since we got the good satellites up in the early '80's to study these global systems. The North Pacific has lost 26 percent of its plant life. And in a major paper in the Journal Science, I think it was this spring, there was a report that as much as 50 percent, or more, of plant life in the subtropical, tropical oceans, has disappeared.

That's a stunning collapse of the ocean plant ecosystem.

In fact I'll give you another story, another anecdotal note. There was a paper that came out a few weeks ago, in one of the journals of science, and it talked about a discovery. If you Google it on the Internet, under the "clearest water on Earth" you'll discover a story about an ocean research team that found that in the tropical Eastern Pacific ocean, off the Galapagos Islands, east of French Polynesia, they found that water was so clear that UV light from the sunlight was penetrating more than a hundred meters, into the ocean.

[22:00]

And they noted that the only other place on Earth that water was so clear was in the Antarctic lakes that are buried beneath the mile or more of the Antarctic ice sheet, where they've been in the cold and dark for a half a million years, and are as close to lifeless as any place on Earth.

But where they found the most lifeless water on Earth was in the middle of the Pacific Ocean. In a vast area. And of course, those geophysicists reported it as a great physical curiosity about the characteristics of the ocean. And those of us who are ocean ecologists sort of, you know, let out a breath, a gasp, saying "Oh my God, that's lifeless ocean, at a vast scale." So the oceans are in dire shape.

[Alex] I have a clip about that, that I'm going to play for the listeners. Again Dr. James Lovelock, who has his own scheme for using algae to save the Earth. I'll just play that now.

[23:00]

[James Lovelock on Radio Adelaide] And the best system to work on is the ocean. And for two reasons. One, it's the biggest system on Earth. It's 70 percent of the surface. And secondly, there's nobody lives there. So you're not going to have any politics involved.

What you could do... the reason the ocean's gone sour, for us at the moment, is once the water gets over 14 Celsius, which is not very high, it forms a stable floating layer on top, into which nutrients from below can't circulate. And, as a consequence, the algae die, or almost die. And you could look at the ocean as a desert.



You can see this yourselves. If you go anywhere in the tropical waters, it's beautiful clear and blue, and you can see right down. It's clear and blue because there's nothing living there. If you go to polar waters they look like soup, they're so thick, and you can't see through them at all, because they're full of life.

So, if we could mix in the cooler waters from below, which contain loads of nutrients, with the hot waters from above, then the algae would grow again, start blooming. They would then pump down the carbon dioxide, make the cloud gas, and help cool the planet.

How do we do it? It mightn't be that difficult. With enough pipes, just plastic pipes going down a hundred meters, and using the wave energy, the waves as they come over, with a flat valve at the bottom of the pipes, water will keep coming up continuously. And perhaps it might do it.

[24:40] [end of Lovelock clip from Radio Adelaide]

[Alex Smith, Radio Ecoshock] OK, well now there are two points here I'd like to discuss. First, both you and Lovelock say that the oceans are in big trouble, and that the lovely blue water we see in most of the tropical oceans, as we've just discussed, indicate they are almost lifeless, perhaps dying.

But Lovelock attributes this plankton loss not really to micronutrient lack, but a lack of mixing in the water, due to warming of the seas under climate change. What makes you think that micronutrients will help solve the problem?

[George] Well, we simply know simply know from the hard data, from the Earth science agencies like the NASA, and NOAA, and other agencies, that we see a direct correlation of the decline in circulating atmospheric dust, and ocean productivity. At the same time as we see the Atlantic Ocean lose 17 percent of its plant life, we've seen a decline in the amount of dust that reaches the Atlantic Ocean, the North Atlantic Ocean - and that dust is not reaching those ocean regions because Carbon Dioxide in the air feeds terrestrial plants very well. And in the case of this planet, which is mostly covered with grass, not trees, when the grass is green and lush, we call that good ground cover. And when it dries up in the summer, and becomes brown and crispy, it's not very good ground cover, and the dust rises in the wind, and that dust doesn't go to waste. It actually feeds and nourishes our oceans.

But with 44 percent more carbon dioxide in the world's atmosphere today, than there was 100 years ago, CO<sub>2</sub> is feeding grasses of the planet. Where they get their CO<sub>2</sub> out of the atmosphere, at the expense of giving up water.

And we know that grasslands of the planet are staying greener for a few weeks longer, each year, in the summer, and that's a big part of summer. It's a big part of the dusty season, and directly correlated with the greening of the grass of the planet, is a decline of the green-ness of the ocean.

It's a classical ecological cycle here. You know, we live on spaceship Earth, and nothing leaves here, you know, and nothing goes to waste.

[26:50]

[Alex] This is fascinating stuff. You are listening to Radio Ecoshock. Our guest today is Russell George, the CEO of a pioneering company called Planktos. Their business is removing dangerous carbon dioxide out of the atmosphere.

[station break]

[Alex] Well Russ, Planktos has purchased a ship for this project, the 115 foot long research vessel "Weatherbird II". Where is the ship now, and how has the project progressed?

[George] Well, Weatherbird is sitting in a berth, dockside in South Florida, awaiting the arrival of some mission-critical scientific gear. Ocean science isn't such a big field that there's lots of suppliers of different equipment, so when we ordered a lot of the equipment that was needed for the vessel on her mission, we thought it would arrive in May, according to our contracts, but it's started to arrive in the past couple of weeks, so things have been a little bit slow. That's nothing new in the world of frontier research, which is what this research is.

So, we expect that the ship will be underway sometime next month. In fact, just yesterday I hired our new Captain, which was formerly one of the most senior captains of Greenpeace, who has decided that he'd like to join our project because he's passionate about saving the ocean, and he knows that we're working on that, and is committed to help us.

When the ship leaves Florida, she'll head through the Panama Canal, and into the Eastern Pacific, and her destination is the Eastern tropical Pacific, near the Galapagos Islands, but still far west, and clear of the islands. And the reason why we go to that region is that the Galapagos Islands are a massive source of natural iron.

The Islands are, one, are far out to sea, they are six hundred miles out to sea. And two, the ocean there is very high in nutrients, but very poor in plant life. And that's because they are missing micronutrients. And the islands themselves contribute vast amounts of iron to the ocean there, and surrounding the Galapagos Islands is a massive plankton bloom. That is produced by that natural iron. That bloom enshrouds the Galapagos Islands and drifts a thousand miles to the west. And it's the perfect biological control, natural control, for studying these iron-stimulated plankton blooms, which is what we aim to produce.

Two previous major international science projects took place in the same area. So, on one side of our bloom project we'll have that incredibly sterile, lifeless ultra-clear water of the Pacific that was reported, clearest water on Earth. On the other side of our project,

we'll have the fabulously wonderful rich environment of the Galapagos bloom, that makes those islands the marine oasis that they are. And our little bloom, that's a fraction of the size of the Galapagos bloom, will be squarely in between. We'll be able to do the best possible science, to determine whether this method really is a solution to restoring the world's oceans, and replenishing life in those oceans, and fighting climate change at the same time.

[30:15]

[Alex] You know, you've taken some flack from environment groups, who worry an untrained entrepreneur is going to single-handedly dump material into the ocean. It's a long line-up of people opposing your project. The World Wildlife Fund has spoken against it. Greenpeace has murmured about it - and others - and I notice you've answered your critics in the Ottawa Citizen, and on your own web-site.

First of all, to save us some time, can you give us the website, so people can see your responses in detail.

[George] Sure. You just go to planktos.com It's like the word "plankton" but with an "s" instead of an "n". There's an extensive website there, that you'll see. And in the coming months, you're going to see a live Internet educational site located there as well. Where people and schools, from around the world, will be able to log on, and watch the work of our international science team - hardly our inexperienced purely money-oriented entrepreneurs that some of our critics would like to say we are - doing some of the best science that has ever been done on ocean plankton.

You know, no science expedition in the history of ocean plankton studies has ever had a ship dedicated to study a plankton bloom for its entire life cycle, of the bloom. So the little Weatherbird - she's a small but stout ship - will be on station all of the life cycle of those plankton blooms that we create. And, also simultaneously studying the native bloom, the natural Galapagos bloom, at the same time.

So we think, you know, we're doing the best science that has ever been conceived of in the ocean science world. And our critics have ... frankly, we're just flabbergasted, as to how they could spin their tales that a plankton bloom hundreds of miles west, downstream, down wind of the Galapagos, would defy the laws of physics, and end up drifting back on the Galapagos, and impact it, where the Galapagos Islands themselves are enshrouded in a vastly larger plankton bloom of the same character.

And everything we know about that Galapagos bloom is that it's a wonderful, live-giving, beneficial environmental feature on the planet.

[32:20]

[Alex] The government of Ecuador...

[George] The critics, they have their own motives for running their email campaigns that tell you to oppose Planktos, and click here, and make a donation... And some of the Greenpeace people who have objected to it, from their armchairs, are not in agreement with the Greenpeace mariners, you know, the front line Greenpeace people from the ships who are joining us.

But everybody can stand by and watch. And we're going to do our job, and we're going to find out if this works, and if it does, it's a terrific possible/potential solution for a planetary emergency.

[33:00]

[Alex] Does the Government of Ecuador, who are officially responsible for the Galapagos Islands - are they for your project, or with it? Or, how do they...

[George] Well, we've had mixed comments from some of the government officials there. We're not going to be in Ecuadorian national waters. We'll be far away from there, in international waters. We simply have chosen that location because we like to use the Galapagos bloom as a research reference bloom. And we're hoping to periodically make, you know, port calls back to the Galapagos to refuel, to re-stock the ship, and to bring science and media crews on board.

We've had requests from television stations around the world to come on board with us. So we are hardly operating in secret. We are inviting all comers, to come and witness this, and bear witness to the work. And make sure. Look over our shoulders. Make sure we are doing the right thing. We're convinced we are.

[Alex] Ummm, and then finally, the Scientific Committee of the London Convention, which is an agreement to control ocean dumping, issued a tough consensus Statement of Concern, in Spain, on June 22nd - warning about environmental risks, and lack of scientific evidence the process will work. Some call it even "geo-engineering." So how do you respond to that?

[George] Well, the geo-engineering that is taking place on this planet is the poisoning of the oceans with the anthropogenic CO<sub>2</sub> that we're pouring into the oceans, that have resulted in making the oceans 10 percent more acidic in the last couple of decades.

And the Royal Society came out with a report a year and a half ago, saying that ocean acidification was proceeding at such a rate, that it was endangering all ocean life.

You know, ocean plants often form little microscopic shells around them, like Diatoms, and things like that, and if you want to win the Nobel Prize in ocean science, you seek to win the Bigelow Medal. And Henry Bigelow once stole Walt Whitman's quote that said "All beef is grass," - and he commented that "All fish are Diatoms." Diatoms being one of the ocean plants, phytoplankton plants, and the Royal Society says the Diatoms are dissolving. And they may go extinct by the end of this century.

So that's a cataclysmic collapse of the ocean ecosystem. And so the people who suggest that working towards reversing that, are doing some kind of geo-engineering - well, we might be doing geo-engineering, but it's reverse geo-engineering. We're the cure, not the cause, of the crisis in the ocean.

[35:45]

[Alex] I hear you. Well, you plan to use nanotechnology for the iron dust, that's another wonder that I have. Do we know the environmental impact of putting ultra-fine, rather unnatural, particles into the sea?

[George] Well, that's a mis-nomer, that one rather extreme environmental group, that has a problem with nanotechnology, who has completely distorted the view. What we're using is sub-micron iron rock dust. Right. Anything under one micron in diameter is some number of nanometers in diameter. So, our particles are typically 500 nanometers.

The people who expressed concern about nanoparticles are typically talking about dry systems. When a nanoparticle is in the air, and floating around, we talk about it as being a problem. As soon as a nanoparticle enters any liquid, a particle down around 200 nanometers - any particle - is called a "colloidal particle." So, your body, my body, every liquid on Earth, is full of colloidal scale particles. Which are in fact nano-dimensional particles.

So our 500 nanometer particles are erroneously described as "dangerous nano technology." That's simply erroneous. And knowingly so, by the groups that have suggested that's a problem. And so, it's just, how else can we answer that? Except to say they simply don't understand their chemistry or physics.

[Alex] Well, I suppose anybody who sets out to do something cutting edge, or new, is going to get some rocks thrown at them, from the establishment, if you like.

I wanted to ask you: people can go to your website and buy a carbon offset for a trip that they might want to make, and of course they're going to want to know that the company they deal with is reputable. Who does own Planktos?

[George] Well, Planktos is a public company. It's on the stock exchange. The trading symbol is PLAKT. So you know, people are buying and selling the shares of Planktos every day. A good chunk of our investment funds have come from a few different green-minded investors. One particular guy out of Vancouver, who started. But most of the money now originates out of Zurich and London, out of the EU - where the marketplace, and the consciousness for climate change solutions is enormous.

[38:28]

[Alex] Right. So one of your founding investors, I guess, was Nelson Skalbania

[George] That's right.

[Alex] I've found him on your website. Does he still have a controlling interest in the company?

[George] No, no. He doesn't have a controlling interest. Another company called Solar Energy, that he has shares in, that I own shares in, has a controlling interest in Planktos. But the control of the company is, you know, typical of public companies, is a little bit obscure, from the different shareholders, and agreements that are in place to fund it. Any start up company has that situation.

Ah, you know, Nelson, I refer to Nelson, to people who ask me what his position is, that he is my "green angel." You know, he's a guy who came to me when he saw the project as a result of some other work that we were doing. And he took one look at it, and he's a very smart guy, and he said 'Wow. How often can you find a project where you can save the world, and make a little money on the side?'

And he immediately wrote a check, and said 'Let's get to work.'

[Alex] Well, in an April 2006 SEC filing, there was some doubt about the future of the company at that time. It was basically saying should the funding fail to materialize in the next 12 months, the company will have to abandon the research, and maybe forced to cease its activities. Have things improved since then?

[George] You know, start up companies, you're always one SEC filing behind in terms of the reporting to the public. And so, you're always... I'm an environmental guy, and I thought I would, I'd get to run this dream project of mine. I'd get a research ship. We'd get to go out to sea. And I've turned out to spend much of my time on the business side of it, and investment, money-raising side... And, it goes up and down, but we're still alive and running, and we have lots of funds that are committed and coming toward us, but - so we don't think that we're going to shut down anytime in the near future.

But, it's a start up company, especially in very frontier areas like this, always look a little bit risky. So, if you're looking for a bricks and mortar sort of no-risk investment opportunity, don't buy PLAKT shares.

But, if you're looking for a great possibility to save the planet and make a little money on the side, then we think we're the ticket.

[40:50]

[Alex] Well, you know, there's one thing I'm hoping you might change about your presentations, if you don't mind my saying...

[George] Sure.

[Alex] I think that even though you may well be on the right track, isn't it important to make clear to people that are buying these offsets that they are buying future CO2 reductions, providing the company plans work out. Because, so far, the trees haven't been planted, and the algae haven't been fed. And I don't feel that's really clear on the site.

[George] I thought that was somewhat clear, but in fact carbon credits are sold by a vintage year. So, in 2007, which is when we're selling credits, we will surely have trees planted in our Hungarian forest project. And we will most surely have our ocean plankton blooms underway. We'll be booking, onto our books, very large numbers of tons of carbon credits, of carbon offsets.

So, we're very confident that we will, that we have our sales backstopped from our website. Frankly, we don't advertise the website very much. I'm happy that you're helping us out with some plugs here, today, but there's not a lot of sales into that public market. Our primary focus is in the EU heavily regulated market. But we think we can cover that. We're certainly, absolutely certain we have all of the sales that we've taken, covered.

[Alex] All right. Well, we know that capturing carbon dioxide is really somewhat of a short-term solution, a fix to keep the climate alive while we go about the business of ending fossil fuel use. And, you have another passion, maybe the real long-term solution, and that's in fusion energy.

We can't spend a lot of time on that today, it's not really why I called you, and it's a complex science, but can you tell us a little bit about your work with fusion energy, and your other company, D2Fusion.

[42:45]

[George] In a nutshell, D2Fusion is a company that is based here in the Silicon valley. We have another - we have a laboratory and sharing [?] facility in Los Alamos, New Mexico. And we're engaged in that topic that 18, or almost 19 years ago, was called "cold fusion." Another couple of scientists, Fleishmann and Pons [check spelling] made these momentous announcements to the world that you could fuse Hydrogen atoms together, and make Helium. In the same process that powers the Sun and the Stars.

But in solid state environments, through a quantum physics mechanism, you could obtain this fusion with no radiation. And of course, nuclear power has always been the dream of lots of people. You know, power too cheap to meter. But of course, it turned out to have that downside of nasty radioactive waste - that was a long-term issue, and a critical issue, for health and the environment. But, cold fusion, solid state fusion, simply fuses two heavy hydrogens together, and makes a helium atom, in the absence, - and makes a lot of energy - in the absence of nuclear waste, of any kind.

So, its the ... and the scientific community around the world, while much of it still eschews it, you know, we were heartened when the U.S. Department of Energy came out with a report a couple of years ago, about cold fusion. And, they said, well there might be something there that is worthy of research. A team of nuclear scientists from Los Alamos said 'We'd like to join your company. We've seen what they've reviewed, we think you're on to, on a track.'

So, we're right about ready to make some pretty momentous announcements, and demonstrations, of cold fusion, as a practical energy source.

[44:36]

[Alex] Has your new tech been verified by any independent labs, or scientists?

[George] Yes it has. You know, we have demonstrated it for the Electric Power Research Institute here in the United States. We've operated at a number of National Laboratories, here in the U.S. and abroad. We have a team of scientists, headed by Nobel prize-winning physicists, who are watching over our shoulder.

And when we, when we finally have everything ready, which is in the very near future, we're intending to sort of show you what the other side of the coin on the solution for global warming is, which is, you know, we have to have a new energy source. We're gonna run out of fossil fuel, and if we burn all the fossil fuel we have, we're gonna kill the planet, with the carbon dioxide it puts out. So, we darn well have some alternative energy.

And fusion has always been that alternative, that the world has been looking to. The problem has simply been, it's so radioactive, it's hard to work with. Well, cold fusion has all the energy, and none of the radiation.

[Alex] Well, let's get back to the real reason for our call today, about Planktos, and I want to ask you: what is coming up for you this year, how do you expect to see this whole venture unfold?

[George] You know, in about a month's time, we hope to have a ship, we hope the ship will be in the Eastern Pacific. And, around early October, we think that the first tree, we're confident that the first trees will be getting planted in the ground, in Hungary. So we'll have our European climate forest project will be underway. And we will have our ocean restoration, eco-restoration project underway in the Pacific.

And we'll be putting tons of carbon dioxide onto our books, that hopefully we'll be able to sell in the marketplace. And we're quite certain, because we have an incredible amount of interest from major buyers around the world.

And the business will be launched. And we really will be one of the green pioneers, in providing real-time solutions for climate change.



[46:52]

[Alex] We're talking with Russell George, the CEO of Planktos Corporation. Is there anything else you'd like to tell our listeners, and if so, go ahead and tell us now.

[George] Well, I hope everybody understands that it also just takes everybody's small, individual actions to solve the problems of the fossil fuel age. A typical family of four, living here in North America, living in a single family home, has a carbon footprint - that means they emit about 20 tons of carbon dioxide to the atmosphere each year.

Well, if you go to our website, or any of the many other websites that are selling carbon credits from forest projects, and the like, around the world, you'll find you can buy those carbon credits for 4 or 5 bucks a ton. Something of that nature. So, 20 tons, times \$5 is a hundred dollars a year. Do that on a monthly basis, it's 8 dollars and 33 cents. So, what family of four, can't afford to take Mother Nature out for a couple of cups of coffee, once a month, eight bucks a month? In order to take their carbon footprint and turn it from black to green by restoring the planet's ecosystems.

I just don't know what's any simpler than that, and you can do that.

And if you really want to know how your every day, your impact can be measured, in terms of carbon, - I was in the London Underground the other day, I saw a terrific advert on the wall. It showed an empty plastic water bottle, and it pointed out that if you recycle your empty plastic water bottle, instead of throwing it away, it saves enough energy, that the carbon dioxide from that energy use, from the recycling, the saving of the energy, is equal to burning a lightbulb for five hours in the evening. So you can sit down, and you can read a book, in the evening, and put carbon dioxide into the atmosphere, and harm the atmosphere, or, if you recycle your plastic water bottle, you can be carbon neutral for that one evening's book reading time.

And that's the kind of action everybody has to become aware of - and realize that a billion small green steps will take care of the problem.

[Alex] But meanwhile, you are working on large-scale solutions of replanting forests, and possible replanting the ocean forests.

[George] Yeah, the large solution are necessary, and a lot of people aren't going to be able to do everything that's needed to do it on their own. We're not like... I was in China recently, and I discovered that, by law, in China, every Chinese citizen has to plant five trees a year. So every year, in China, 5 billion trees go into the ground. It's astonishing, right?

[Alex] Right.

[George] It's a small green step, but it has a effect on the planet. And, those people who can't afford to go out and plant their own trees, they hire somebody to go out and plant

their trees for us, and that's what we do. You know, we can ... we're an employment agency for green plants, on the land and the sea.

[Alex] We've been talking with Russell George, the CEO of Planktos Corporation. Thanks for a lot for taking the time to talk with Radio Ecoshock.

[George] Thank you for having me on. I look forward to listening to it.

[end of interview]

