Climate Change And The Future Of The World: An Interview With Graciela Chichilnisky

In this highly insightful interview, climate change authority and leading economist Graciela Chichilnisky *talks about the catastrophic threats that climate change pose to the future of the world if we fail to coordinate global actions aimed at the curbing of emissions and the removal of carbon dioxide from the air through the revolutionary technology available. Professor Chichilnisky also argues, however, that technology isn't magic, and that what is required for tackling global warming with carbon negative technologies are fundamental changes in the way the global economy and its institutions have functioned in the post-war era.*

Marcus Rolle: You have been for many years one of the leading forces in climate-change efforts. How do we define climate change?

Graciela Chichilnisky: Climate change means a major shift in climate patterns, such as dramatic increase in the violence, frequency, length, and severity of climate events, including superstorms, tornadoes, typhoons, major floods, and long severe droughts, as well as other climate related environmental disasters. These events increase both in intensity and frequency as energy in the atmosphere increases, which occurs when the mean temperature increases. Climate change also means dramatic changes in long term climate patterns such as desertification, the alteration or the reversal of major ocean currents, changes in the sea level, melting of the planet's polar caps, and glacier periods.

MR: What evidence do you think supports the argument that climate change is taking place and that the global mean temperature is driven up by human

interference?

GC: The statistical evidence conforms to the definition just provided: the planet's polar caps are indeed melting, and the sea levels are indeed rising. This has been measured and is directly observed. We have increasingly violent, frequent, lengthy and severe climate events, major floods and unusual severe droughts that do not correspond statistically to standard deviations from the mean. Thousands of scientists from all over the world who report to the United Nations Intergovernmental Panel on Climate Change (IPCC) have come to the conclusion that changes in temperature are associated with changes in the concentration of greenhouse gases, of which the main one is CO2, and that mean temperature is increasing due, for the most part, to the burning of fossil fuels – coal, natural gas and petroleum -– for economic purposes: industrialization.

MR: There is still resistance in various corporate and political quarters about the facts regarding climate change. Why is that?

GC: Above all, climate change means change. Big change. Enormous change. And there is always resistance to change. The image is a large ostrich sticking its head in the sand: denial of change. Climate change is particularly resisted or denied because it is directly connected to the use of energy, which measures economic growth today. The fear is that climate change will impair progress and economic growth by requiring we stop burning fossil fuels. Of course, economic growth may occur without burning fossil fuels, but in the last century and a half, economic growth meant burning fossil fuels (today, there is a tight statistical connection between the level of a nation's development and the amount of fossil fuels it burns). The same phenomenon happened in the US when slavery was abolished. The fear was that it would impair economic growth, since slaves represented energy and energy is the mother of all markets and the way we measure today economic growth. The connection is spurious. Equally, we can grow more and much better when we use solar energy – the sun after all is the source of all energy in the planet. In fact, fossil fuels are nothing else than solar energy canned in liquid form. But denial, and its cousin, lack of imagination, are powerful forces, they can cause wars and immense destruction. Humans are particularly prone at destruction that is unnecessary and occurs solely due to lack of imagination. The image is human life as a play written by an idiot full of sound and fury and signifying nothing. This is not an exact description of human life, of course – there are exceptions – but is not far off.

MR: It has been said that we must work towards keeping temperature from rising above 1.5C. Is this a safe operating space? And how can we be sure that temperature won't rise much higher than that?

GC: We definitely need to try to keep below a 1.5C increase in mean temperature. The changes we measure today have occurred as a result of just a 1C increase above the last century. According to the IPCC, an increase above 2C is catastrophic, meaning that the climate change disasters described above become frequent and the situation irreversible. Catastrophic changes will move the planet to another climate regime altogether – the point of no return. This happened in the planet Venus where the concentration of CO2 in the atmosphere is huge, and now Venus cannot house life as we know it. However, staying within a 1.5C increase is very hard, because we emitted so much CO2 and we have procrastinated so long in reducing fossil emissions. In fact, this is so hard that it is actually impossible (according to the UN IPCC, in most scenarios) unless we actually remove the CO2 that is already in the atmosphere.

This is called carbon negative technology and it exists and can be utilized to effectively reverse the damage we have done. It would be a major global change, which can only be realized if we organize ourselves and the financial system to build carbon negative power plants to satisfy the desperate need for energy to fight poverty in nations, such as China and India. These are power plants that capture more CO2 from air more than what they emit, about twice as much. These plants exist. They are possible. We need to build thousands of carbon negative power plants, mostly in poor nations that need them most. These will suffice to clean up all the CO2 that humans are emitting every year into the atmosphere, which is about 38 gigatons of CO2. It seems difficult to do but the economics are on our side. The capture of CO2 from air is now economically feasible, it costs less than the price that markets pay for CO2. Carbon negative power plants are an economic reality, they are commercially feasible. We just need project finance to get this done. Where will the project finance come from? The Green Power Fund (GPF) I proposed in Copenhagen in 2009, was partially adopted and became international law with the name, Climate Climate Fund (a one word change). The GPF derives its funding from the carbon market of the Kyoto Protocol which, by 2011 was trading about $175 billion a year; enough to offer the project the finance needed to build the carbon negative power plants that will clean the planet's atmosphere. All that is required is to build a financial

institution – the Green Power Fund – that systematically offers debt finance for carbon negative power plants in developing nations, and circulates the revenues so they are used to build new such plants. This is certainly not beyond our financial abilities. In 15-20 years, climate change can be resolved at a total aggregate cost of $2-3 trillion, which is less than 5% of the planet's GDP in a single year. Spread over 20 years, the financial burden of debt finance reduces to about 0.25% of GDP. But in reality, it is no burden since the carbon negative power plants are commercially viable and produce revenue. The initial money can be obtained from the carbon market of the Kyoto Protocol as well as its CDM.

It is true that, as the architect of the Kyoto Protocol Carbon market, I have an undeniable sympathy for the carbon market. But think of it this way. We all know we need to reduce emissions of CO2, and simply by agreeing on mandatory limits, the carbon market can function – that is how it functions – and produces enough money to terminate the catastrophic threat of climate change. Also, to eliminate or alleviate poverty in the poorest nations of the world, who then become great consumers for the rich nations' exports. The circle closes. We just need to do it. There is nothing to lose and a lot to gain. And if we do not do it, we face catastrophe. It seems impossible to argue against it given the current technologies and what they have already demonstrated that they can do.

MR: According to the Paris COP21 agreement, no action will be taken until 2020, and even that is entirely voluntary. What do we do in the meantime, continue to release unlimited greenhouse gas emissions into air?

GC: In Marrakesh, where COP22 will take place, we need to create the Green Power Fund just described, as was proposed in detail in 2009, and to start building carbon negative power plants in the world's poorest nations. I also have a negotiating methodology in mind that works. We need universal agreement on carbon emission limits that extends the Kyoto Protocol emission limits, so the carbon market can function and provide the funding needed to clean the atmosphere. As everybody knows, this has proven impossible so far. But don't fret. We can start now with "conditional mandatory emission limits" that everybody can, and will, agree to. This is also possible due to carbon negative technology. The industrial nations can make their mandatory limits conditional on the use of technologies that increase economic growth (these are possible now as described above). Also, developing nations can make their mandatory emissions limits conditional on the funding for debt finance provided by the Green Power

Fund. These conditional mandatory limits are acceptable to every nation and do the job. On the basis of such mandatory emissions limits, the carbon market will function and will provide the funding needed to clean the planet's atmosphere. This is the value of global finance, and is an update of the Bretton Woods institutions that work for the 21st century.

MR: You have said that climate change is the mother of all geopolitical challenges. Given today's Europe massive refugee migration crisis, which is partly contributed to climate change, how much more severe could the migration problem become because of climate change?

GC: It is generally believed that this year and the next will see massive migration of tens of millions of people around the globe due to climate change. In their reports, the Pentagon views this situation as one of the major challenges of national security in the U.S. This is also the type of challenge that brings on the worst fears for voters, and causes xenophobic tendencies in a year of presidential elections. The concern expressed right now by the established leaders of the Republican Party is that democracy is at stake, and that fears of massive migration gets transformed into hate and anti-American expressions and policies against the migration of specific racial or ethnic groups, such as those of Muslim origin. Climate change may be the geopolitical factor at stake in the most disconcerting and feared presidential election phenomenon of this year, the successful stream of apparently irrepressible election victories by Donald Trump.

MR: Scientific reports have noted that we must go back to 15 million years to find carbon dioxide levels as high as they are today. You are advocating sucking CO2 out of the atmosphere as part of the climate solution. How effective is today's state of carbon negative technology in cleaning up the air, and is there a market for it?

GC: Direct air capture or carbon negative technology – such as the version that is commercialized at present by Global Thermostat – is proven. It is operational in Silicon Valley at the famous technology campus SRI on Ravenswood Ave in Menlo Park, where the Internet first transactions were carried out, and it is ready to be deployed and scaled up globally. A good question is what to do with the CO2 once it is captured. Is there a market for it? The answer is as good as the question: CO2 is used to produce carbonated beverages such as Coca Cola and Pepsi, dry ice for McDonalds, it can be used to produce carbon fibers that replace metals in

most automobiles, is used to mix with hydrogen in order to produce economically clean synthetic fuels that are molecularly identical to gasoline but do not emit CO2 in net terms, to desalinate water, to produce clean and safe fertilizers that do not poison the soil nor the water, and even to mix with cement to produce stronger and lighter building materials at lower costs. The use of CO2 for building materials can sequester on earth enormous amounts of CO2, soon enough to absorb all the CO2 that humans emit into the atmosphere today, about 38 gigatons per year. We still need to reduce emissions of CO2 to make all this possible, both reducing emissions and carbon removal is needed. But there is a solution today. We just need the organization and will to do it. It can be done. And we will all be better off, as the financial structure proposed here will help redress the enormous cruel and destructive inequality of wealth in the world economy, and the inhuman poverty levels that prevent the satisfaction of the most basic needs of over a billion people in the planet's population.

MR: Why do you think there is skepticism and resistance among certain environmental groups to a ""techno-fix"" of the climate change problem?

GC: It has been said that the radical left is against a technology solution to climate change. The term "techno fix" is a dead giveaway: the fear is the "moral hazard" created by an artificial solution that makes it possible to continue sinning namely continue overusing the earth's resources, such as fossil fuels, and in the process polluting the planet's atmosphere in an unsustainable and destructive way. Put this way, I tend to agree with the concern, even though I co-invented myself the most advanced carbon negative technology that exists today the Global Thermostat direct air capture technology – and even though I founded the firm to commercialize the technology as well.

We need change; we cannot just use technology to continue our destructive and unsustainable use of the world's resources. But there is a secret that I am pleased to share with the reader: technology does not exist in a vacuum nor can it be expected to be our robotic slave. Technology will change us, it will change everything. Moral hazard is a mythological construct. We cannot control technology but if it imitates nature, if it is harmonious with nature, if it is based on the most fundamental virtues of human societies, compassion hope and humility, it can become one with our harmonious development as an artificial organism that reinvents itself on planet earth. I cannot promise redemption but closing the carbon cycle, bringing down every molecule of CO2 that we are

putting up simply reproduces the wisdom of nature: everything is a cycle. And alleviating abject inhuman poverty is a key to redemption if any exists. I say we do not have a lot of choices anyway: let's do it.

—

Graciela Chichilnisky is Professor of Economics and Statistics at Columbia University, Visiting Professor at Stanford University, and author of the Kyoto Protocol carbon market.
Marcus Rolle is a freelance journalist specializing in environmental issues and international affairs.

Previously published: International Affairs Forum March, 15, 2016 ~ http://www.ia-forum.org/