



P E R S P E C T I V E S

by **Rinaldo S. Brutoco**

Rinaldo S. Brutoco is the Founding President and CEO of the Santa Barbara-based World Business Academy and co-founder of JUST Capital. He's a serial entrepreneur, executive, author, radio host, and futurist who's published on the role of business in relation to pressing moral, environmental, and social concerns for over 35 years.



40,000,000 People Fled *Choosing to heal the biosphere*

Last year 40,000,000 human beings were uprooted from their homes and became international refugees. You read that correctly. 40 million people. The vast majority of these people flooding other countries out of a desperate attempt to improve their lives to the point of achieving subsistence living were Climate Refugees. People driven from their ancestral lands by massive destructive forces unleashed mercilessly by “Mother Nature.” So much for the question of when climate change will begin to severely alter human behavior.

By all means, we should breathe in a moment of gratitude that the pandemic is coming to an end for all of us in the US who are vaccinated. Unfortunately, 350 unvaccinated Americans died yesterday (an appalling number), and that will continue unabated until more get vaccinated. However, most of us can look forward to dinners on Coast Village Road and State Street with friends. We can look forward to our children and grandchildren going back to school. We can celebrate events in our lives with our relatives and friends without having to wear masks and; we can give a solid hug where appropriate. And yet, a larger challenge than even the pandemic awaits us: Climate Change.

Everyone knows climate change is “real” who has lived through recent massive flooding or bizarre snow/ice conditions (we’re thinking of you here Texas, Louisiana, Mississippi, etc.); or the accelerated frequency and power of tornadoes all over the place; or the forest fires which have ravaged California. It’s becoming clearer that the very future of human civilization, as we know it, is in question.

In addition to the tens of millions of Climate Refugees referenced above, the damage to our physical world is becoming so grave as to challenge the long-term financial stability of our insurance and re-insurance industries. Insured losses in 2020 topped \$89 billion, the fifth largest loss on record. This was up from \$63 billion in 2019 (a jump of 41 percent in one year!), and 13 percent higher than the rolling ten-year annual average of \$79 billion. In yet another portent of news to come, the most massive iceberg in recorded history, 70 times the size of Manhattan, just broke off from Antarctica because the temperature near the South Pole hit 65 degrees Fahrenheit this past week. How’s that for some polar melting?

“Okay, Houston, we’ve had a problem here,” were the famous words Astronaut Jack Swigert uttered when reporting that the explosive damage to the Apollo 13 spacecraft. Fortunately, the three astronauts were able to abort their moon landing to free up the lunar lander to become a “lifeboat” with enough oxygen for the crew to survive in their return to Earth. What a perfect metaphor for where we are as a species with regard to Climate Change. In some ways, you can think of the next 8+ years of remaining survivable climate on this planet like the “lifeboat” that the lunar module was for the astronauts. That’s all the time we really have before the forces to reverse climate change will be so massive that the time and effort it will take to alter the devastating outcomes will be too great in every way.

Chapter four of Freedom from Mid-East Oil, a book I co-authored that the Academy published in 2007, is entitled “Climate Change: Cloudy with a Chance of Chaos.” Our goal 14 years ago was to provide humanity at least several decades to adapt our society and reduce carbon dioxide emissions down to a safe level. Sadly,

humanity squandered that opportunity. As a result, we now have a global level of carbon dioxide at 420 parts per million (ppm)—a long way from the 350 ppm we should have achieved by now to remain safe, and high enough that it has triggered massive worldwide releases of methane gas from permafrost and the deep oceans. So, what did we think “chaos” meant back then? We listed “increased storm devastation, droughts, intense heat waves, species extinction, ocean acidification, and extinction of marine life” resulting in “massive migration of human species, global economic collapse, and intense civil unrest.” We didn’t pull any punches. We saw that individual nation-states were in great jeopardy and could literally collapse into a Middle Age style battle among conflicting warlords—exactly what we’ve been increasingly seeing in Africa and parts of Asia. With an incredible sense of urgency, what can we do?

First off, let’s recognize that there is no problem ever described, including Climate Change, that cannot be fixed with our existing resources and existing technology if we simply have the collective will to do so. We need to believe we can and will conquer Climate Change, and we recently had some very good news on that front. The major automobile manufacturers are switching over to electric vehicles powered either with batteries or fuel cell propelled hydrogen. Buses, trucks and even locomotives are now running on hydrogen. And, according to Fitch Solutions, the size of the global hydrogen market will grow from the current \$129bn in 2017 to \$183bn in 2023.

We also know that the Persian Gulf oil countries are all scrambling to create “green hydrogen” (hydrogen made using renewable resources) from desert sun to the point that Badr Al Olama, on behalf of the United Arab Emirates, on March 24th predicted there would be 530 million metric tons of hydrogen produced per annum by 2050, displacing 10.5 billion barrels of oil. He, and the monarchy in Saudi Arabia, have publicly declared that they believe Green Hydrogen is the commodity to sell on international markets to replace falling oil sales.

More good news: a court in the Netherlands just ordered the largest Dutch company, Royal Dutch Shell, to reduce by 45 percent their CO2 emissions worldwide by 2030! Even more powerfully, a dissident group of shareholders just took at least two Board seats from Exxon Management because they were incapable or unwilling to adapt to climate change and are thereby jeopardizing Exxon’s future profits. That’s a great story: the largest oil company in the world losing control of its Board for failing to adapt to climate change. If ExxonMobil and other Big Oil corporations aggressively began promoting alternative energy, it will accelerate the healing of our badly damaged biosphere before it is too late.

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