Fusion: Our First, Best and Only Hope

This article is the first of a series of eight articles on fusion power written by Tom Tamarkin and Pat Boone in their collaboration to speak to American citizens…in fact all citizens of the world…on the ill-fated history of fusion power development and the urgent need to resurrect and complete it. The articles were initially written by Mr. Tamarkin and were deemed too scientific and "heavy" for non-scientists. In February 2011 Mr. Tamarkin approached Mr. Boone who agreed to edit and personalize the originals and publish them in his weekly news columns in various media outlets. The articles are based on four years of intensive research and personal interviews with high-energy plasma & fusion scientists and visits to all the leading fusion laboratories.

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Life is so wonderful. Just when you think you may have experienced virtually everything you're going to, something may pop up so unexpectedly, so "out of the box," that it opens a door to new possibilities or exciting new opportunities. At least it's been like that with me.

I'm a singer, an author, a businessman, a regular though multi-dimensional guy, but I'm certainly not a scientist. I'm aware, like you surely are, that the world is in serious, serious trouble when it comes to our energy needs. We cannot go on depending on fossil fuel, because there's a finite supply and it adds to environmental problems. And absolutely no known alternative can do more than scratch the surface. Even nuclear energy, with all its power, has just demonstrated the dark side of its potential.

But that's nuclear fission. I've just been learning about nuclear fusion.

They are vastly different. And the latter, nuclear fusion, is the answer. It has much greater proven power potential – and none of the negatives. Let me explain what I've learned. And I've learned it from people who know.

World population is projected to rise to over 9.5 billion people by the year 2060. Much of this increase will take place in developing nations. The citizens in these developing nations, along with those of established high-density population nations like China and India , have an absolute right and desire to increase their standard of living to the level of the Western world. The citizens in these developing nations, along with those of established high-density population nations like China and India, have an absolute right and desire to increase their standard of living to the level of the Western world. Due to the proliferation of the Internet and frequent travel, populations can no longer be subjugated by corrupt regimes and kept from demanding the good things of life. And moral-centric nations like America and Israel feel impelled to help them achieve

these things. It's truly in our nature. But how?

The fundamental ingredient required to support mankind is energy. If other nations are to enjoy our standard of living, they will require energy resources equivalent to those consumed in the United States and the West, in ratio to their populations. Today the population of the U.S. is slightly more than 300 million, or 4.4 percent of the world's peoples. Yet America consumes 28 percent of world energy production. So for the rest of the world to rise to anything like our standard of living, we'd have to increase world energy production by 8 times.

Energy production from fossil fuels, by most estimates, has peaked in terms of capacity. We will run out of oil. So a new, much higher flux density source of energy must be found and developed. There is only one realistic source. That is the direct conversion of mass into energy based on Albert Einstein's law, $E=MC^2$. This law teaches us that a very small amount of matter – even one gram – can be converted into a very large amount of energy equivalent to the burning of over 7 million gallons of gasoline!

So why keep on drilling for energy? Energy is all around us. And the key is described in the opening verse of the Bible. It's the very energy of creation, what many scientists describe as "the big bang," in which indescribable energy erupted from solid mass – and formed the universe as we now know it. Through nuclear fusion.

Can we utilize it? Yes. Has it been tested? Yes. It's the same process by which thermonuclear warheads work. Isn't anything nuclear dangerous? Not necessarily. We're not considering nuclear plants that operate on the principal of fission, the ones that have been functioning in the U.S. and Europe for over 50 years, currently providing Europe 35 percent of its power. As Japan has just shown us, fission has serious drawbacks. It requires expensive, highly radioactive fuels such as uranium and plutonium, which are dangerous and highly sought after by black marketers and terrorist organizations … with deadly intentions.

Fission also produces dangerous radioactive waste, with a half life of 25,000 years. And, as seen in Fukushima and Chernobyl, a fission reactor can melt down under certain circumstances, releasing enormous radioactivity.

By contrast, fusion has none of these dangerous drawbacks. It uses an isotope of hydrogen called deuterium and lithium (to breed tritium) found in the ocean. It produces virtually no long-term radioactive waste. It cannot go critical, leading to a chain reaction explosion. And there is an abundant source of fuel to power the world for millions of years, if necessary.

Why hasn't this been done? It should have been, and almost was. In 1980 the Congress overwhelmingly passed the Magnetic Fusion Energy Engineering Act, signed by President Carter. The goal was to have demonstration reactors by 1995, and reactors actually feeding the American power grid by 2005. What happened? Nothing. Other things "came up," and the Act was never funded to a level high enough to achieve its goals. Since then, the science has been virtually shoved aside and forgotten by the public and our leaders.

Are there any other answers, any easier or safer “renewable” energy sources? No. Collectively, all the solar, hydro, tidal, bio-fuel, geothermal and wind energy sources combined can produce only 4 percent of the projected world energy requirements of 2060, for a population of 9.5 billion.

Fusion is the only possible solution.

How do we achieve it? The U.S. and Israel, with its tremendous scientists, must immediately commission a serious fusion development program, with the same military-like efficiency and focus of a war effort – which it surely is.

We can use shale oil and natural gas reserves to bridge the gap, buying the time necessary to bring fusion to commercial utilization. How much time? That depends on the funding and the sense of urgency, but it may take $25 billion and as much as 20 years, but it is possible in less.

We’re clearly living on borrowed time – if we want to preserve life as we’ve known it, America must be even more insistent about developing nuclear fusion than we have about restoring constitutional government and a sane economy. And we’ve got to begin now.

I’ll write more about this later, while I’m learning more myself. But I’m certain this nuclear fusion is nature’s choice …God’s choice… for energy, the very essence of Creation itself. And it’s our only hope.

Tom Tamarkin is the founder & CEO of USCL and EnergyCite®. In the 1970s Tom was an undergraduate student at Northern Arizona University majoring in physics with a dual minor of chemistry and applied mathematics. Tom is credited with inventing the electrical utility smart grid-Smart Meter in 1991…well before the concept of the smart grid became popular. In 1992, Public Power Magazine published an article which has become the basis for the “smart meter” which is now the corner stone of the current U.S. Department of Energy utility stimulus grants program with emphasis on energy conservation and awareness. Tom holds six granted patents on the smart meter system and has numerous patents pending. Tom lives with his wife of 30 years, Emily, in Carmichael, California.

Pat Boone is a legendary Hollywood icon in the preforming arts who traces his ancestry to the American pioneer, Daniel Boone. Pat has sold over 45 million albums, had 38 top 40 hits, and starred in more than 12 Hollywood motion pictures. Pat graduated from Columbia University in New York City, magna cum laude in 1958. Pat is well-known for his old-fashioned values, which contributed to his fame and popularity in the early days of the rock & roll era to the present. Today he is still active on television and in the motivational speaking circuit. Pat has spent the last few years writing columns and books and runs his own record label named Lion & Lamb. Pat’s first book, “Twixt Twelve and Twenty,” Prentice Hall, was a number 1 Best Seller in America. Pat lives with his wife of 60 years, Shirley, in Beverly Hills, California.