

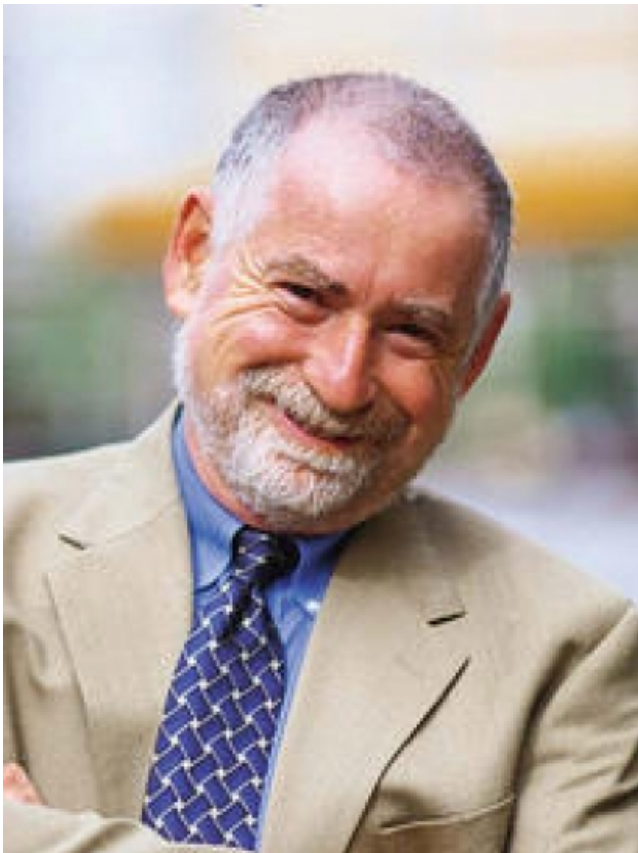
interviews

Peter Schwartz

World's foremost scenario planner applies his expertise to the renewable energy sector

Tuesday, 05 July 2011 [Dan McCue](#)

There are many in the US and around the world who believe you don't need a weatherman to know which way the wind blows, you only need Peter Schwartz to determine whether the skies ahead will prove fair or foul.



One of the world's leading futurists and scenario planners, Schwartz, the son of Hungarian Jews who had been in concentration camps, has consulted with everyone from the White House to multi-nationals to Hollywood directors.

If that's not career enough, he's also a venture investor with the [Alta Partners](#), a firm based in San Francisco in US state of California with a long history of supporting high tech and renewable energy startups.

Born in 1946 to Klara and Benjamin Schwartz, who were living in a displaced persons camp in Stuttgart, Germany at the time, the young family eventually moved to Camden, New Jersey in the US, where Peter Schwartz grew up and where he first became intrigued by how complex things come together and how the future "works".

Between then and the start of his remarkable career, he attended Rensselaer Polytechnic Institute in Troy, New York.

After a brief stint as a high school teacher in Philadelphia, Schwartz moved to the US west coast, where he began his career as a futurist and professional builder and user of “scenarios” at the [Stanford Research Institute](#).

As head of SRI’s Strategic Environment Center Schwartz and his team researched the business milieu, lifestyles, and consumer values, and conducted scenario planning for corporate and government clients.

While there he caught the attention of Pierre Wack, the unconventional French oil executive who developed the use of scenario planning and who at the time was in charge of thinking about the future at [Royal Dutch/Shell Group](#), then as now, one of the largest energy companies in the world.

Through initially resistant to leaving California to join Wack’s staff in London – working instead on projects for the company from SRI -- Schwartz would eventually succeed his mentor there.

Between 1982 and 1986, Schwartz headed scenario planning for the energy giant and with his team conducted comprehensive analyses of the global business and political environment and worked with senior management to create successful strategies.

At the heart of Schwartz’s science is the belief that too many professional planners rely too heavily on bottom line statistics and effectively miss the intangibles – people’s hopes and fears and beliefs and dreams -- that dramatically affect the ultimate outcomes of actions.

Schwartz believes that only through scenarios – stories encapsulating several different possible futures – can business executives, government leaders and organizational planners make sound decisions based on reckoning that captures both the tangible and intangible.

In 1987, Schwartz took the plunge into entrepreneurship, founding [Global Business Network](#), an international think tank and consultancy. As president of the Emeryville, California-based firm, he leads a group that includes many of the world’s leading edge thinkers about the future, innovative scientists, artists and business executives.

Schwartz is also a senior partner of the Monitor Group, another think tank and consultancy.

Over the years his clients have included the President’s Council on Sustainable Development; the US Departments of Defense and Environmental Protection; Singapore’s Research, Innovation and Enterprise Council; and scores of corporations.

Schwartz’s work on climate change and energy-related issues spans three decades. He is author of five books, including [The Art of the Long View](#), which outlines his “scenaric” approach to strategic planning, [Seven Tomorrows](#), and [Inevitable Surprises](#), and untold number of papers and studies.

Over the years, Schwartz has frequently written optimistically about the future of the renewable energy sector, and, as detailed below, he’s acted on those sentiments with a commitment of his venture capital dollars.

Reading over things you’ve written and said about renewable energy in recent years, it seems to be you’ve been fairly optimistic about the development of the sector. Recently, however, the sector has been buffeted by a rolling back of incentives in Europe and continued uncertainty over US energy policy. Aren’t things kind of a jumble right now?

Well, I think that's right, but having said that, renewables are going ahead more quickly, in more places, more often, and with a greater variety of technology and technological options than ever before. And along with that, investment in companies within the sector has been quite remarkable.

But there's no denying, it is a mixed tale: Some places have been more successful than others, some have more politics than others and so on, but compared to where we were three years or five years ago or ten years ago, we've actually made a lot of progress, both in deployment and in improving the technology.

Having said that – and as I just said to a colleague – we've had a significant growth in a small number, and you can raise that by somewhat and it is still a small number. We have gone from one percent to two percent to three percent and you can raise three percent by 50 percent and you're still only at four-and-a-half percent. That's my point.

“But as that number gets much larger, each increment will be larger still... its classic exponential growth. We're at the low end of the growth curve. So I am actually quite optimistic about the impact of renewables, and given the nature and the magnitude of our climate change challenge, we do not have the option of “Or.” Everything is “And.”

We need renewables and efficiency. We need nuclear and clean gas and... it's, you know, “and,” “and,” “and.”

It's interesting to hear you mention nuclear, with Japan, right now, struggling with the aftermath of the Fukushima Daiichi disaster and awaiting a decision – an imminent decision – on the future of reactors that were shut down for maintenance long before the earthquake and tsunami last March. You haven't soured on nuclear?

Well, I certainly made people a bit more cautious and it pushed the Germans into a pure frenzy – it's astonishing what they've decided. We're going to find out in Germany, in a really interesting experiment, can you run a modern industrial economy purely on renewables, or will they, as a lot of people think, end up importing a lot of dirty energy from Poland and the Czech Republic or nuclear energy from France? In which case, they will have simply exported their guilt.

OK, but you're famous as a planner of scenarios. Say you're sitting in Germany and making decisions about your energy future. With all the known facts in front of you, where does that lead you?

Well, it depends on what you do. If you are a household, you may not be too terribly concerned, except maybe about your job. But in terms of getting power to your house, there's a pretty good chance you'll do it.

But, if you are an automotive producer or a chemical producer or part of all the different engineering or manufacturing activities that take place in Germany at a fairly significant level, for export, which is what makes them rich, you have to ask yourself the question, can I actually sustain my operations [on renewable] unless there's some radical change in the technology?

Understood, but then you have the addition factor in play, which is the pull back in incentives – financial mechanisms that some would argue foster further technological innovation – in many corners of Europe...

I think those occurrences are a function of two things. One is they worked so well is that there's just a lot of capacity and they are asking, ‘Gee, do we really need the incentives to get much more at this point?’ So, frankly, in one part, it was too much success. And that's hard to argue with. We did well, so we don't need quite as much of an incentive anymore. So that is one part of it.

The other part of it is they are all cutting budgets, and so these are tax incentives and so on that they can close. So, having said that, it is a combination of economic circumstances and the very success of the very thing they set out to produce.

My guess is that when the economies recover and when that capacity is more fully absorbed, you'll get some of these incentives coming back.

But doesn't this create unnecessary boom-and-bust cycles? For instance, to use an example here in the US, when the development of bio-fuels was being significantly subsidized a few years ago, ethanol and other kinds of bio-fuel plants began to proliferate in many parts of the country which had history had agricultural based economies. When the subsidies expired, the plants were shuttered. And now that some subsidies have returned, we're starting to see a return of some of that activity...

Doesn't this lead to a lack of clarity, especially for the venture capital types who might otherwise invest in these activities?

Oh, it's really bad. Yes, that's true. But let's be very clear, most of what the United States has done by bio-fuels is incredibly stupid. The corn-based ethanol and the stimulus to that have been solely about satisfying the farmers, and have had nothing to do with energy and the environment. Actually, it's a net negative on both counts.

So pulling back from the current generation of bio-fuel is really smart, I believe. Because what we were doing was really dumb. Having said that, the next generation of these fuels – say in terms of synthetic biology, modifying organisms to create clean fuels – this is a big step forward. But that's just beginning, and we can do much better in that respect than we've done. That said, getting rid of the current generation of bio-fuels is a good idea.

Let me follow up with a point of... Well, I'll call it "contextualization," and then kind of swing back again to the idea of a lack of clarity. On the first point, I wonder if you can describe your activities as a venture capitalist, particularly in terms of whether you only invest in US companies or invest internationally as well.

If you are a player in international investments, I'd then like to know how things like the rolling back of incentives for renewable is creating such a lack of clarity as to the direction of the industry that it is influencing your investment decisions and perhaps causing you to pull back a bit...

The answer to the first part is yes we do invest around the world, and secondly, the broader issue you are pointing to is quite fundamental.

Some places have better strategies than others; China among them. Singapore among them. They have been far more persistent in their pursuit of these kinds of technologies, and then there's your point about the policy being both inconsistent between federal and state governments, on the one hand, and inconsistent over time – where state and federal policy vacillate a great deal -- on the other hand.

These are a real barrier to investment and deployment, particularly in the United States. Remember, our primary energy policy [in the US] is still "maximize demand, minimize supply, and import the rest from the people who hate us the most."

That is still the overwhelming policy. In America you have strong incentives to buy a big house, fill it with energy consuming devices, live far from work, and drive a car. That is basically what all US public policies

encourage you to do. And that determines your energy and environmental footprint more than anything else: The size of your home, how far you drive and what kind of car you drive. You put all that together and that's your environmental footprint. And all of our policies are aiming to provide that for every American.

So we are not serious yet about really transforming America's energy behavior. That's why we vacillate so much.

OK, so how do we finally achieve some kind of clarity – and rationality – to promoting renewable energy?

The first thing is that the political process has to recognize that this actually is an issue. At the moment, even [President] Obama – and, let me preface this by saying [US Energy Secretary] Steve Chu is a very close personal friend – he's completely on board, 100 percent, and he's completely stymied by the US Congress. He's completely unable to do the kinds of things we wish he would do. And, as a result, they've given up.

And it sounds like, in terms of policy, what we're talking about really is a need not just to change the current policy regarding energy, but also policies related to city planning and infrastructure and the like...

A terrific recently published book that deals specifically with [the US state of] California – although the issues and analysis applies everywhere or almost everywhere – is by Peter Calthorpe. It's called *Urbanism in the Age of Climate Change*.

It's absolutely terrific and it really gets into how you design urban areas to minimize the environmental footprint, and it's very effective and it is very clear. So I think the data, the research, the analysis, exists in terms of knowing what we need to know.

It's just getting to that next stage, of acting on it...

Exactly. And the truth is, over time, we probably will.

Let's talk for a few moments about renewable energy and clean technology from an economic development perspective. Given everything that's just been said, how do you create a climate of opportunity for startups and new businesses?

Ah, well, you've already pointed to what is probably the single biggest barrier, and that is the inconsistency of policy. Short of that, there probably isn't that much of an issue. But having said that, there's plenty of venture capital around. Anyone who has a good clean tech idea can get funding. There are lots of people pursuing it. In fact, the real risk right now is that we've over-invested in it and there will be a bust coming because I think a lot of people were overly optimistic about how long it would take. The typical venture cycle is too short for a lot of clean tech. Energy systems take much longer to deploy and become profitable than the stuff in high tech.

So I think we are going to see both a decline, in the short run, of investment, and a number of companies getting into serious trouble because they have been unable to reach the marketplace. I mean a good example – and a painful personal example [laughs] – is: I am an investor and director of a micro-fuel cell company and we are 10 years into our four-year R&D program.

Wow...

I mean, have you seen a lot of fuel cells coming out?

I have not.

We were all very optimistic a decade ago, myself included, it just proved to be harder than we thought. My only point is that the timeframes here are longer, so one of the issues will be a new whether there is a new generation of capital available to keep funding many of these companies, and they won't all get it. And so that shake out will begin to happen shortly.

That having been said, there's no real lack of private capital; there's no real lack of entrepreneurial energy, there's no real lack of technical options. So I am actually quite optimistic about the range of startups now going on, particularly in the United States.

Do venture capitalists understand renewable energy companies as well as they've come to understand tech companies like those emanating out of Silicon Valley?

Not at all. And that's a problem. They don't understand energy demand. They don't understand energy infrastructure. As a result, you've had many people who have been overly optimistic about how quickly various elements of infrastructure would be converted to renewables.

And unlike high tech, and I mean this in the most positive sense, the interest in renewable by venture capitalists was ideologically driven, values driven. High tech was driven mainly by the notion, "Does this thing make money?" Here it driven by, "Does this thing clean up the air or reduce carbon concentrations, clean the water or whatever?"

That muddies the investment decision. Now, I'm not saying they shouldn't have done it; don't misunderstand me. But it makes it much more difficult to have a more rigorous investment process.

You know, I was just thinking about something that was said to be recently about hybrid cars. There's this notion that right now, buying a hybrid is a value option, because the relative economic payoffs – relative to a vehicle using a combustion engine, aren't that significant. The individual I was speaking with then went on to say that we won't meet our goal of widespread adoption of hybrids until those economic payoffs – miles per gallon ranging from 150 to 200 miles – are achieved.

So how do we make that leap and get to where something that is now a value option is also an economic option or imperative?

Well, to use your example of a hybrid vehicle, two things are going to happen. One it's going to get cheaper. And the price of gasoline will continue to rise. Yes, it will go down a bit from time to time, but we are in an era where the cheap gasoline, the cheap oil, is mostly gone, so the incremental oil will be more costly.

We are not running out of oil, mind you. There's no peak oil; just more costly oil. And on balance, that will result in higher prices for gasoline. Now, we'd rather pay the tax to Riyadh [Saudi Arabia] than to Washington, DC because we are stupid; and we'd rather [spend money unwisely] than clean up the air by giving ourselves a carbon tax, which is the most intelligence thing the nation could do. A two to three to four dollar carbon tax would solve the federal deficit, clean up the air, wean us from Saudi crude and so on, but having said that, we are stupid, so we don't do that.

Now, back to hybrids, I think Chevy, with the Volt, has basically got the right model – it's a serial hybrid, as opposed to a parallel hybrid, like the Prius. With the Volt, electric motors turn the wheels and the only thing the internal combustion engine does is charge the battery. This allows an enormous amount of steady

improvement and doesn't rely on radical breakthroughs in batteries. Better batteries continuing to be the great bugaboo in this area.

Battery technology is something I'm less optimistic about, but I am optimistic about the incremental improvement of serial hybrids that will get better and better, and will perform better and better: So they'll be cheaper and get higher and higher mileage and they'll drive better and lots of cool things.

So my guess is that by 2020 most new cars will be some form of hybrids and poor electrics, but more the former than the latter, unless there's a better battery.

Do see these advances being led by corporate R&D or technology transfer from research universities?

Some of both. I mean, the hunt for a better battery is ubiquitous. Making cars is mostly the task of big companies. But, you know, you do have some startups in that arena as well, like [Palo Alto, California-based] [Tesla Motors](#), which are actually having an impact – not that they are selling a lot of cars, but they are pushing people. I'm not at all sure that investing in Tesla Motors is a good idea. On the other hand, what [Tesla founder and CEO] Elon Musk has done is pushed people's thinking and made electric cars sexy. But the big money is still going to be made by GM, Ford, Toyota, Nissan and etc.

That contrast between big and smaller players also plays itself out in the realm of delivery systems – the whole debate over whether, as we continue to adopt renewables as an energy source, we're going to be on a grid or off of it, the latter case, for instance, being people who only derive power from solar panels on their homes...

Ultimately, however, we're going to be on the grid, aren't we?

Mostly. There's nothing wrong with people putting solar panels on their roofs. If they want to do that, that's fine. It's not the most economical thing to do or the most effective use of our capacity to build. But there's not much downside to it.

The big solar that we need falls into two classes: Basically, every flat roof in the sunny parts of the country – every shopping mall, hospital, Wal-Mart or warehouse -- ought to have solar panels on them, because those kinds of large scale installations actually make a lot of sense to feed into the grid. You get enough scale so that the maintenance costs and installation costs are effective. That we should be doing everywhere.

I also agree that we should be doing large central solar, whether it is solar thermal or big fields of photovoltaics, the truth is we need a lot of capacity, and remember, it's not just households that require energy, it's every gas station and 7-Eleven [a US convenience store chain] and cleaners and shopping mall... and even if you undertook the effort I outlined above, they still couldn't generate all the power they need. So they are going to need grid power, and grid power, the only way to get there, is through large installations. Some of that can be integrated into buildings, but a lot of it is going to have to be in an open field somewhere.

Let's get a bit deeper into the economic development side of renewable. I've heard it said that given the kinds of salaries young people are being offered in the renewable energy industry – particularly in places like Northern California – the average, tech-trained 24 year old would be crazy to go to work for a renewable firm as oppose to Facebook or Google?

Are we giving young people enough of an economic incentive to go into this field?

Well, we have to separate that question into two different things. All of those bright young people who are working in startups, are not there principally to make money at this point. They were at Google – Well, not even at Google – Google was also founded on an idealistic principal: Change the world. Now, they happened to have made a lot of money, but I know [Google founders] Sergey [Brin] and Larry [page] quite well, and they were not drive by money. They were driven by a desire to change the world. They wanted to organize all of the world's information. You know, it was like, "I am an uber nerd." And oh, they found a formula, after [current executive director and former CEO of Google] Eric Schmidt came along for making a lot of money.

There's a lot of that kind of energy out here. So at that level, I don't worry at all. But on the other hand, that is a tiny fraction of the jobs that we are really talking about. The jobs that we are really talking about are manufacturing and installation and operation in clean tech, whether it is water or power.

Now there it is a different story, and it is much less clear that the huge volume of green jobs will materialize. Now, one place where it may – it's actually quite significant -- is in construction. For example, we are already seeing the effect of it in California. This was part of [Governor] Jerry Brown's strategy was. There are a lot of construction jobs in building the big installations -- wind farms, big solar fields, and so on.

California lost 600,000 jobs in housing construction when the economy tanked a few years ago. We put about 150,000 of those people back to work by freeing up renewable energy projects. We had 60 proposed renewable energy projects on the books, of which 40 were blocked, mostly by local opposition. And so, what's happened is we've begun freeing those logjams up and started creating jobs for those classes of workers – construction workers, particularly – with these big new projects. This is a good thing.

But the question is, how sustainable is that? Because once we build these – and mind you, we have a long way to go – but once they are built, I don't know how sustainable these projects are when it comes to job creation. Are we only getting a one-time boost to employment and once these things are done, that's it. Or, is this an industry that's really going to continue to expand on a sustainable basis. That I really don't know.

So I guess the critical question to be asking in places like my home state of South Carolina, where a lot of people are looking to renewable energy as a future cornerstone of the local economy, is whether that instant, early burst of economic activity – building the infrastructure – is going to turn into meaningful long-term and continued employment later on?

I think that's the right question.

The tech industry is famous for spinning out new CEOs and new companies. There's a kind of critical mass in the industry that seems to constantly mint new entrepreneurs. Have we reached that stage yet when it comes to renewable?

Perhaps. But it's really too soon to know. We have seen some of that already – people leaving one solar company or one synthetic biology company and starting their own. That has happened to a limited extent.

A good example is a company called [Hara](#), it's a company that specializes in energy systems and energy efficiency, and its CEO [Amit Chatterjee] comes from McKinsey and Co., the consulting firm. So you're getting people from all over the place into this industry. So I don't worry about its ability to attract talent.

Many communities here in the US, and I imagine, throughout the world, are led by folks how talk about attracting "high paying, high tech jobs" and of creating clusters to foster the creation of a "new Silicon Valley" under their watch. How successful are those efforts generally?

Almost no one has succeeded. Silicon Valley was an accident. It didn't happen by design. So there are very, very few examples of people getting this right. One of the only examples I can think of is Austin, Texas, which has done a pretty good job of this – I don't know yet whether it's a net positive on their investment, but nevertheless, it has witnessed the creation of a lot of companies and interest and changed the local business environment around the University of Texas.

That being said, I am very dubious of such efforts. Almost none of them succeed. Because people aren't really prepared for what it takes. Having said that, I think governments can do a lot.

When Jerry Brown was governor of California the first time [in the mid-to-late 1970s], I took him to meet one of the founders of Intel, Bob Noyce, one of the giants of the computer industry. We had dinner in Palo Alto in 1978 and Jerry turns to Bob and says, "What can I do to help you?" And Bob says, "I want two things: One, a first class education system, and two, stay out of my way." He was very clear. And Jerry got the message.

Where there is an engine for growth, there are a few things government can do. It can provide good infrastructure and provide good education. Incubators rarely succeed.

I am involved with Singapore. Singapore is doing it. But you have to understand how much money an undertaking like this takes. I oversee the R&D and innovation in Singapore. When I started, the funding commitment was \$13 billion, and now it's up to \$16 billion.

It's working there, but most people aren't prepared to put those kinds of resources behind such an undertaking and stick with it and invest as much as these guys have.

I notice that among the things you said governments can do, you didn't mention subsidies...

I think in general it's a bad idea. I like things like carbon taxes. Deal with the thing you want to get rid of; don't try to choose who the winners are in an economic competition. Create the context in which people can compete intelligently. I am one of those people who believe gasoline in the US should be \$6 a gallon [note: On July 5, 2011, as this article was being published, the average price of a gallon of gasoline in the US stood at \$3.55 a gallon]. And everything between that and Saudi production costs ought to be taxed.

Just to step back a moment, are they doing tech business incubators?

Yes.

So why are they succeeding where others haven't? Is it simply the money?

No, it's because they are liberating a youthful energy there that was really suppressed by the old system. And they had a latent potential that they are exploiting.

Therefore, it seems that if you were going to succeed at doing this in the US or elsewhere, you'd have to look for an analogous potential that hasn't been tapped or that has been similarly suppressed?

Exactly. And if it ain't there, you can't create it. You can attract it, but that takes time.

In terms of infrastructure intended to foster the growth of clean tech and renewables, I guess what we are talking about is almost more about philosophy... a philosophy of infrastructure... it's not just about spending stimulus dollars for the sake of spending them.

Right. And for some reason the Republican Party in this country has decided that the country doesn't need good infrastructure. They don't have any problem with second-rate roads, highways and rail, etc.

Renewable energy is a highly competitive business sector. China has seen an explosion of activity in recent years. Europe has long been a bastion of the industry. The competition is fierce. What do you see as the future of renewable energy, particularly here in the US?

Well, let's be clear. This is actually a positive sum game. It is not a zero sum game. The opportunity in renewable energy globally is so large that there is room for everybody to play. The Chinese are quite aggressive because they believe that it is essential to their own domestic survival. Having said that, they've built up enough capacity to export to us; we've got to meet their challenge. We have to lower our costs, we have to produce better, and we have got to market better. It's a great competitive challenge, but I don't think that it is one that cannot be met. It's actually good for us; not bad.

And the truth is, this is technology that is masterable. It's much simpler than semi-conductor technology. Making a solar panel is much simpler than making a microchip. The designs are well known. The technology is well understood. You can make them better or worse, but we know how to make them.

Have the people that we, as a country, are competing against, mastered something about education that we've overlooked or taken for granted?

Yes and no. Have they mastered the process of committing their students to becoming good technicians and learning enough technically, the answer is unequivocally yes. Have we screwed up our lower education system, our kindergarten through 12th grade, unequivocally yes. So we have a big problem in K through 12, they do not.

We, on the other hand, have the advantage of the great universities; they do not. And the real innovation comes out of the great universities. There is a reason why the bay area is so innovative. The Chinese ranked the top 20 universities of the world, of those, 17 are in the United States, the other three are Cambridge, Oxford and Tokyo; six of the Top 20 are in California, three are in the San Francisco Bay area. And that's hard to match. The Chinese are headed that way, but that's a 30 to 50 year problem to address.

When you are doing your scenario planning – say, looking at a problem like this – how do you account for the surprise science that might occur; that innovation out of left field that turns things on their ear?

You build scenarios around potential leaps. It helps to have seeds, so that you are not saying, "Imagine something that does not yet exist" However, a good example that I have been focusing on in new small scale nuclear, and there is a break-through fusion device out here in California – actually it is a giant laser that is already producing fusion, not net positive, but will be probably early next year. If that can be turned into an actual power plant, that changes the situation fundamentally; you have clean, cheap electricity forever with water as your fuel. End of story.

Now, we don't if it is going to work, we don't know if it will be net positive, and we don't know if it can be turned into a practical plant, but we can see the seed of a revolution there -- unlike the big, magnetic bottled fusion in France, that is ever going to work. This one is already working. They are doing fusion every single day.

When does that because something that a business guy, a venture guy, gets involved with and wants to grow?

In this case, about two years. Within about two years they will know whether they have something that can be translated into a practical device. If that happens –and it is still a big “if” – they know the physics works; what they don’t know is can they actually get enough energy out to make it worthwhile. It’s a big uncertainty, but at least here we can see the seed of a breakthrough that really is a game changer.

I think synthetic biology is a game changer; i.e. that we move from hydrocarbons that are fossil sourced to ones we make that are actually sucking CO₂ out of the atmosphere, so that there is no net CO₂ production.

The first practical application of that technology is up and running in Brazil. It’s being done by a Berkeley, California-based company called Amorist is producing diesel fuel from sugar at \$3.50 a gallon. So that’s already happened and it will simply get better and better with more and more options, a greater variety of inputs, a great variety of outputs and a greater variety of processes.

For additional information:

[Peter Schwartz page at Global Business Network](#)