‘This Is Brand New’

The CEO of Bloom Energy on a new way of powering the planet.

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K. R. Sridhar spent years building technologies for NASA that could sustain life on Mars. Now, as CEO of Bloom Energy, he's trying to perfect a device that could improve life on Earth. His company builds fuel cells—small power plants, essentially, that can power anything from a single home to a whole city. NEWSWEEK International editor Fareed Zakaria spoke with him about these "Bloom boxes," which convert gas, biomass, and other fuels into electricity. Excerpts:

Tell me about your transition from working on the Mars mission to this. It became obvious to me that on Mars, if you give me a few molecules of oxygen, I can create everything else human beings need: fuel, heat, electricity, plastic, food, water. So I started looking for someplace where I can make an impact in a realistic time frame, as opposed to something far in the future. It dawned on me that if we don't solve the energy issue, we will have significant problems.

Why is Bloom so important in terms of the future of energy? Look at what distributive computing did to computing. We wouldn't have millions of software engineers if computing relied purely on mainframe computers hooked up to dumb terminals. Why? Too expensive. Access is limited to the privileged. Distributive power is real democracy.

So this is really a big bet on the power of decentralization? Absolutely. If you go to Google or Microsoft or Amazon, they all have huge data centers. Inside, there are actually small servers ganged up in groups of hundreds and thousands. Our fuel cells are exactly the same thing. I can cluster our energy servers and build an energy farm. Or I can take the same technology to a little village and create a microgrid.

But you still need to get the fuel from a centralized source. That is true today. But the same technology I am using today to turn chemical energy, like natural gas, into electrons, can be used with an intermittent source, like solar or wind.

But don't you need to then store the energy somewhere? Think of it as being able to spin in two directions. In one direction, I take the solar energy during the day, and I break water up into hydrogen and oxygen. The hydrogen is stored locally in very low-pressure bladders. And at night, when the sun stops shining, you take this hydrogen, run it through the fuel cells, and produce electricity.

How can you ever be more efficient than a big power plant? The question to ask is, in a traditional power plant, is there a Moore's law kind of learning that can happen? The answer is no. There are 100 years of history associated with that [technology]. Whereas we have shown in the last five years that, every year, we are able to improve upon the physics and the chemistry to get more value out of the same material that we put in.

And because you can distribute fuel cells everywhere, you don't lose much due to long transmission lines? That is absolutely true. Also, in a fuel cell you are going from chemical energy directly to electrical energy, with no in-between steps. In the other forms of electricity generation, whether it is coal or gas, you burn the fuel first. And the laws of thermodynamics say that if you convert energy from one form to another, you will have losses.

Your capital cost is high, something like $7 or $8 per watt. Right now we are only economical with subsidies.

Why do you think this will be viable without subsidies in the future? If I build a large automobile plant, and I have just put out the 30th car, do you expect me to be profitable? Ask anybody in manufacturing: for every doubling in volume, you will see a 10 to 15 percent reduction in cost.

How long before you scale to the point where you can have a transformative effect? Within this decade we'll be a significant player in this field. That's a very short time frame, if you think about the market and how static it has been. We are not just creating a company—we are creating an ecosystem. There is no supply chain right now. This is brand new.

What do you think the world of energy will look like in 10 years? Energy is the capacity to do work. We've got 2 billion starving people on this planet, and they want to climb the economic ladder. Without creating significantly more energy than we consume today, we'll face the threat of social and political unrest. But I'm an optimist; I see this as the biggest opportunity.