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# Electricity Producing Air Conditioners Using a Salt-Based Process that Will Revolutionize the HVAC Space

***Dr. Daniel A. Betts***
*CEO and Founder*
**Be Power Tech, Inc.**

**CEOCFO: *Dr. Betts, would you tell us about Be Power Tech?***
**Dr. Betts:** Be Power Tech is developing electricity producing air conditioners. These systems will allow our clients to eliminate electricity expenses associated with cooling and heating building spaces. In fact, the air conditioner becomes a power generator that actually provides electricity to the building, eliminating electricity consumption. All of this is done utilizing natural gas.

It so happens that in the United States 40% of the primary energy is used in buildings. That is the single largest sector of energy consumption in the United States. Within that sector, the buildings primarily consume electricity for powering lights, computers, and cooling and heat systems. In fact, electricity consumed for cooling buildings makes up 70% of the peak US electrical demand, making the single biggest stressor of the electric grid system. When we look at the demand charges and the cost of infrastructure for electricity, most of it is going towards being able to supply enough electricity to cool buildings. This mostly occurs in a very concentrated portion of the year: the summer.

**CEOCFO: *What is the science and technology?***
**Mr. Betts:** We are utilizing a salt-based air conditioning process invented by us and by scientists at the National Renewable Energy Laboratory, in Colorado. We combine the salt-based air conditioning process with an electrochemical power system called Solid Oxide Fuel Cell. This system uses natural gas and directly converts it into electricity and heat. The heat derived from electricity production drives the salt-based air conditioning process, which dehumidifies and cools down the air supplied to buildings. The innovative combination of these two technologies is the principle of our technology.

**CEOCFO: *What does salt have to do with it?***
**Dr. Betts:** Salt has a high affinity for water, and has a high affinity for water vapor from the air. The biggest energy consumption in air conditioning is the dehumidification of air. The standard air conditioner cools and dehumidifies air. What we do is use a salt solution and put it to a high concentration state so that it wants to absorb water vapor. We then allow this high concentration salt solution to come in contact with air through a microporous membrane. The water in the air goes to the salt solution and the air is dehumidified. We then cool the air by adding water to a portion of the dehumidified air. This cool air is used to cool the dehumidified air that is introduced to the building. We are enabling evaporative cooling in any humidity environment. The efficiency of this process is very high. To keep the process going all we need is heat, which we get from the fuel cell system.

**CEOCFO: *What are the economics of how it is so cost-effective?***
**Dr. Betts:** Our studies are showing that in general we are able to save buildings a substantial amount of money in energy costs. The first product that we are developing is a 10-ton air conditioner, which is the standard rooftop air conditioner for commercial buildings. This system would produce 5kW of electricity continuously. We are seeing that just the replacement of a 10-ton unit with our unit would save our customers more than ten thousand dollars per year in energy savings. Note that the high efficiency of our system makes it so that the cost of the natural gas consumed is less than the value of the electricity produced by the system. In other words, you are able to sell electricity to yourself at a profit or sell electricity to the grid at a profit. The air conditioner becomes a money-making machine rather than a cost.

**CEOCFO:** ***Where are you in the commercialization process?***
**Dr. Betts:** We are still in product development and we are two years from commercializing our first product.

**CEOCFO:** ***What has changed in your approach or the mechanics of what you are doing as you have been developing?***
**Dr. Betts:** The principle thing that we have learned is the potential impact that this product has to reduce energy consumption in the US and to provide dramatic environmental benefit. We have learned for example that every one of our systems is equivalent to eliminating five cars from the road. That is significant. If you think about it, one of our air conditioners is like buying five Tesla electric cars. We have also learned that the level of savings are quite substantial for the project. Initially we had underestimated the level of savings, because we had been looking at the problem primarily as an air conditioning problem, but once we started to look at the entire energy space of a building, we started understanding that we could eliminate demand cost also. Other opportunities have also become evident. For example, with our system, real estate can become power generation. The impact of the product is so high that it has even surprised us.

**CEOCFO:** ***How do you plan to get the attention and the initial usage?***
**Dr. Betts:** One way that we are plan to overcome barriers is by making a product that feels exactly like the product that people buy today, with only one principle exception, which is that the product will power the building. The other point is to provide our users with overwhelming economic value. With this overwhelming economic value, we believe there is enough demand to be able to solve these initial barriers to entry.

**"By providing a product with overwhelming benefits and having IP protection around this product we have the capacity to change the nature of the air conditioning space and the nature of how we power our cities."- Dr. Daniel A. Betts**

**CEOFO:** ***Are there any challenges in bringing natural gas to a building that might use the system or is that easy these days?***
**Dr. Betts:** Natural gas interconnection with buildings is generally easy and commonly done. Most air conditioning units also act as heating units. It is cheaper and more efficient to provide heat to a space using natural gas. Many air conditioning systems already are installed with natural gas hook-up for heating. One of the important aspects of our technology is that it is more like replacing a light bulb rather than having to ask the user to do anything new. We do not require the user to put in any new infrastructure into their space in order to be able to utilize our products.

**CEOCFO:** ***Will you be working with manufacturers?***
**Dr. Betts:** We are presently working on outsource manufacturing the product and plan to keep within our purview key aspects of the product. On the marketing strategy, we are planning to launch product in particular cities, one at a time. In doing that, we are going to establish a network for distribution and support for the product and plan to work together with the natural gas utility.

**CEOCFO:** ***Are there energy conservation organizations that you might work with to promote the idea?***
**Dr. Betts:** We are working closely now with the Department of Energy in product development and we are starting to get data on the operation of the product in all sorts of environments. We plan to continue to maintain this partnership into the field trial phase. The government has a strategic need for this type of product. Other target partners are organizations involved in supplying or ensuring supply of natural gas and electricity to buildings. They have a vested interest in this product. The natural gas utilities in particular are some of the biggest winners because we enable them to sell gas in the summer and enable them to participate in the electricity generation market. On the electric side, we eliminate the principle headache of the electric utility, which is the summer demand for electricity, which is completely based on air conditioning. So we plan to work closely with electric utilities. Large building owners are also important partners. Our technology and products have the capacity to save them significant amounts of money and energy.

**CEOCFO:** ***Do you have the funding for continued development or will you be seeking funding?***
**Dr. Betts:** We are now working with Flagship Ventures, who is the principal investor in the company. We are also establishing partnerships with strategic clients in the space.

**CEOCFO:** ***Were you sure that the concept would work?***
**Dr. Betts:** I was sure that the concept would work. Before I started the company, I spent a lot of time evaluating technology and making sure that the concept would work. Only after I knew it would work I went out and sought financing.

**CEOCFO:** ***Why pay attention to Be Power Tech?***
**Dr. Betts:** We are targeting the area of highest impact from an energy and emissions standpoint in the United States. We are targeting a market that is not well served by existing products. This market has global revenues over $180 billion per year. Our direct addressable is over $10 billion/year in the US alone. By providing a product with overwhelming benefits and having IP protection around this product we have the capacity to change the nature of the air conditioning space and the nature of how we power our cities.

**Interview conducted by: Lynn Fosse, Senior Editor, CEOCFO Magazine**

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# Be Power Tech, Inc.

**For more information visit:**
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