

Bringing to Market an Ultra Efficient Cooling and Heating System that can Reduce Energy Costs 50% to 80% for Commercial Buildings, 7AC Technologies Inc. is Revolutionizing the Industry with their Liquid Desiccant Design with a Proprietary Membrane that Guarantees Zero Salt Carryover into the Building Air



**Clean Technology
Energy Retrofits
(Private)**



**Peter Vandermeulen
Founder, President and CEO**

BIO:

Peter Vandermeulen, President, CEO and Founder, 7AC Technologies, Inc. Before founding 7AC, Peter founded BlueShift Technologies to introduce the use of continuous flow semiconductor processing to the semiconduc-

tor industry. He has raised over \$20M for BlueShift and closed a Venture Capital "A" round during his last MBA class at Babson College.

Prior to founding BlueShift, Peter was VP, GM of Brooks Automations' Factory Interface Systems, and ran marketing and sales for their Vacuum Systems Businesses Unit which he helped grow from \$2.5 to \$60M in 4 years. He helped design the E500 Ion Implanter at Varian Ion Implant Systems, which resulted in sales of over \$2.4B and more than 800 units installed worldwide.

Peter has a background in physics (MS Eindhoven University) and business administration (MBA Babson College) and holds 18 patents with many more applications pending.

Company Profile:

7AC Technology has licensed 7 patent applications from the Department of Energy's National Renewable Energy Laboratory (NREL) and has independently filed 16 patent applications around design concepts.

The 7AC technology consists of an all-plastic conditioner, responsible for treating the outside air, and a regenerator, for re-concentrating the desiccant. The liquid desiccant design allows for the utilization of waste heat sources, paving the way for true net-zero energy retrofits.

Our proprietary membrane design guarantees zero salt carryover into the building air by confining the salt to the plate surface while allowing the free transfer of water vapor. We have the ability to cool in summer and re-

cover heat and moisture in winter, giving our system year-round utilization with compelling payback terms.

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

CEOCFO: Mr. Vandermeulen, what is the concept behind 7AC?

Mr. Vandermeulen: We make ultra efficient air conditioning systems primarily for commercial buildings. The technology that we have is based on a license from the US Department of Energy, specifically the National Renewable Energy Lab. It has the potential to save commercial building owners anywhere between 50% and 80% of the energy that is used for cooling and heating in their buildings.

CEOCFO: What is the technology and how does it differ from what is currently available?

Mr. Vandermeulen: What an air conditioner does is take outdoor air and cool it down quite substantially to the point where all the moisture in the air condenses out, which is why conventional air conditioning is always dripping water. What we do is, instead of overcooling the air and needing to possibly reheat it to get it to be more comfortable otherwise you end up freezing people in the building, we capture the moisture in a liquid salt solution, and salts are very good at absorbing water. We run air over a liquid salt and then we can use waste heat sources anywhere from solar, or heat from a piece of equipment, or from some other industrial process to get rid of the water that we have caught in the salt. Then the salt can be re-used. What is unusual about our

technology is the salt itself is not directly exposed to the air because if it is, then you have the risk of that salt getting carried as particles into the building and corroding everything that is metal in the building. We actually have the salt behind a high technology membrane that works a little bit like Tyvek on your house. It lets water vapor go through, but not liquids like liquid salts or liquid water, so it is a one-way process, in other words, the water vapor in the air goes through the membrane into the salt but the salt cannot come out, so the problem of corrosion on the building is completely non-existent in the equipment.

CEOCFO: Has your process been tried in the past?

Mr. Vandermeulen: Without the membrane yes; there are a number of suppliers that have systems in the market without the membrane. I think we are the first one to commercialize the system with a membrane.

CEOCFO: How do you make the membrane, what is it made out of and why does it have those unique properties?

Mr. Vandermeulen: It is a membrane that is made out of plastic and is basically polypropylene. It looks a little like a kitchen garbage bag. It is very thin and is made by a supplier. This is a relatively new technology that was originally developed to make advanced batteries like lithium batteries and battery separators.

CEOCFO: Where are you in the development and commercialization process?

Mr. Vandermeulen: We have built proof-of-concept systems about a year ago and we are now building the first commercial prototypes, so these are full-sized machines that are going to be tested here in Massachusetts on commercial rooftops. Once we have data back from that and from a test laboratory that we are using, then we will start building the commercial products and that will be early next year.

CEOCFO: How costly is the change?

Mr. Vandermeulen: This is direct replacement. The machine can fit in the same spot as an existing air conditioner. However, in our system, you would only have to replace about one in four existing air conditioners with one of ours, so you leave the other three on the roof, you take one off and put ours in, and that reduces the energy of the whole set of machines by about 50%. Our machine uses less energy but it also reduces energy of the remaining systems.

CEOCFO: How does it reduce energy on the remaining systems?

Mr. Vandermeulen: What we do is provide cool dry air into the space, so we take up a large quantity of outdoor air, cool it, dry it and put it in the space. We do that very efficiently, so the fresh air that is coming in on the existing equipment can be shut off because you do not need that anymore. We essentially take over the

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fresh air cooling from the existing machines and that allows you to then run the existing machines more efficiently.

CEOCFO: What is the expected ROI?

Mr. Vandermeulen: It is highly dependent on the application of course as well as the location of the equipment, so in other words, in places like Miami where you run air conditioning systems about eight thousand hours per year, the payback is in a couple of months. In places like Boston where we located, it is probably just over a year typically.

CEOCFO: Do you have a marketing strategy in mind as to how you will present this to the many commercial properties that could use it?

Mr. Vandermeulen: The strategy is that we are first approaching commercial properties that have typically high humidity levels. This could be places like grocery stores, or it could be like places that need low humidity in the space that are located in high humidity environments, such as Mi-

ami or the whole southeastern US. Typically, buildings that use rooftop units which is typically one to three-story buildings max, and people that have an interest obviously in energy consumption reduction, so our ideal target is large corp. Companies that have an interest in energy reduction and that are willing to partner with us could eventually scale to many stores across the country.

CEOCFO: Will 7AC be handling all of that, or will you be looking to partner with others to get the product introduced?

Mr. Vandermeulen: That is not entirely decided yet. We would be interested in talking to potential air conditioning partners. I believe that at first we are going to be working with end users to prove the technology works. We will also partner with air conditioning installers, people that already do installations of air conditioning equipment, because that is not a function that we do ourselves but any company that currently is installing the conventional air conditioning systems can certainly install ours. It does not require any

specialized knowledge or technology to be able to do that, it installs very much like an existing air conditioning system.

CEOCFO: Is 7AC Technologies funded to get you through the next steps of development?

Mr. Vandermeulen: Yes!

CEOCFO: Why should investors pay attention to 7AC Technologies?

Mr. Vandermeulen: Building energy cost is typically around sixty percent of the operating cost of the building, so the heating and cooling cost can run 60% of the operating cost, but we can take that number down in half and particularly for places like grocery stores where profit margins are very thin and energy costs are very high. Being able to save half the energy on that space is a significant to the bottom line. We think that the first adopters on these technologies will have a significant bottom line advantage.