



Environmental Consulting & Engineering

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Midlands Business Profiles

Conversations

Ken Reifsnider, Director of the Future Fuels Initiative



Ken Reifsnider

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MidlandsBiz:

Why did you come to the University of South Carolina?

Ken Reifsnider:

This country faces not just an energy problem, but also a more fundamental issue of sustainability. What attracted me to the University of South Carolina was the extraordinary opportunity that this region has to position itself as a major player in the search for viable alternative fuel solutions. My expertise is in high temperature energy systems. As the Director of the Future Fuels, we are looking to develop expertise in the areas of nanotechnology, energy, and also health sciences. As Director of the Solid Oxide Fuel Cell Group, our goal will be to create systems that convert different forms of energy into something we can use to sustain our society.

MidlandsBiz:

What role will hydrogen play in that mix?

Ken Reifsnider:

Hydrogen is essential in our day-to-day lives and is already an enormous industry. Between 2005 - 2006, this country produced 15M tons of hydrogen for use in a wide variety of applications: for sulfur removal, for making fertilizer, and as it is now harder to find sweet petroleum, for converting heavy, sour crude oil to clean petroleum in our cars. Hydrogen is nothing more than a convenient way to store and carry energy, and is simply another fuel like gasoline.

Hydrogen is a very flexible fuel and especially with fuel cells applications, you can produce electricity with virtually no detrimental effects to the environment. It is inconvenient because it can't provide the total answer to the energy requirements of our modern society. If we were to replace gasoline with hydrogen in our cars we would need to produce something like 17 times the amount of hydrogen that we are currently making. We are not likely to see that level of production in our lifetimes, and it may not be possible at all. So the energy systems that we come up with may or may

not involve hydrogen.

MidlandsBiz:

Talk about the potential of fuel cells.

Ken Reifsnider:

The idea of converting materials, or fuels to electricity in fuel cells is a relatively old technology that dates back to as early as 1844. Some of these fuel cells operate at low-temperatures and require pure hydrogen. Others require higher temperatures and can operate on hydrogen that can be produced by using biomass fuels or even steam.

The fuel cell is a nice device, we just need to develop more practical applications to meet our everyday energy needs. We think we can develop a commuter car that won't plug in to anything or use any fuel, so that would be an example of a very attractive opportunity.

It is in the area of energy systems that this region can really gain a long-term competitive advantage, not necessarily just fuel cells. Energy needs are specific to local areas; therefore, the solutions have to be discovered at the regional level. Some states may be outspending us, but Columbia, South Carolina has an unparalleled level of collaboration across the spectrum of public and private sector groups and an incredibly determined and focused local leadership group.

MidlandsBiz:

How do we get there?

Ken Reifsnider:

It's about partnerships and attracting talent. Recently, the university collaborated with eight other universities on a project. The Savannah River site has recently been recognized as the energy storage experts for entire United States; it is a huge asset to this state. We are building state of the art laboratories in new buildings to attract "best in the world" talent to new faculty positions. We also have world class talent on all of our advisory committees.

My job is to bring all of the assets and resources together to develop a wide variety of energy systems that can help us locally. We have a power plant at the University of South Carolina that is producing a couple megawatts of power just from wood chips. Coal will be part of the equation, as will nuclear, biomass (which we have in abundance in this state), hydrogen, and to some degree wind, and solar.

Finally, with governments stretched for cash, the United States will not be able to solve these issues without a huge innovative push from industry.

Who knows exactly where all of this will lead, but these are very exciting times for this region. Below is a possible timeframe of how this might play out over the next 20 years.

- 5 years. Create a framework for defining the current problems, identifying all of our assets and resources and defining the goals.
- 10 years. Create systems to solve the problems through a combination of solutions.
- 15 years. Create the infrastructure to make it all happen.

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