

**Blue Ribbon Commission on America's Nuclear Future
January 7, 2011
Augusta, Georgia**

**Testimony by
Clint Wolfe, Citizens for Nuclear Technology Awareness**

Good morning. My name is Clint Wolfe. I have been a resident of Aiken, SC, for more than 22 years. I am the Executive Director of Citizens for Nuclear Technology Awareness (CNTA) and I am the chairperson of the Public Policy Task Force for the Carolinas Nuclear Cluster. I retired a few years ago from the Savannah River National Laboratory where I served as what is now called an associate director in charge of research and development support for actinide chemistry including plutonium and uranium fuel and target recycling, tritium related defense programs missions, strategic materials, and the Global Threat Reduction Initiative. In the late 1990's I served as the chairperson of the Technical Advisory Panel to the Department of Energy's Plutonium Focus Area.

It was my privilege to address your Subcommittee on Reactor and Fuel Cycle Technology in August in Washington, D.C. At that time I made a case for the utilization of the tremendous assets that exist, not only in Aiken, but in the Central Savannah River Area and in the three states of South Carolina, North Carolina, and Georgia. I would like to incorporate those comments by reference in today's proceedings. Also, by reference, I would like to include an opinion editorial that I authored and which was published in The State newspaper a few weeks ago on the economics of recycling used nuclear fuel. With those remarks on the record, I would like to expand today's remarks to what I believe must be the energy future of the nation.

What will be our energy policy? If we had one, would it survive the next election cycle? How will we provide energy to our nation in a way that provides a reliable, safe and secure energy future? The policy must encourage the production of safe, clean, affordable energy. The policy must be one that sets an example for the entire world. This country, justifiably, puts great faith in the ability of free markets to implement policy, but they cannot be expected to define policy.

Our energy policy must deal with how to effectively implement the choice or choices that we ultimately make. For many of us with technical backgrounds, that means we have to do our homework, or in this case, research, development & demonstration (RD&D). Technology maturity will vary with the option being considered and with it the need for RD&D if it is needed at all.

Currently, the only mature energy sources that we can employ in a discretionary manner for powering the nation's grid are fossil fuels and nuclear energy. Hydroelectric power is important, but it is where you find it and we have found about all that we have. Many would argue that we

should use more wind and solar power. After all, it has been calculated that there is more energy in a category 5 hurricane than in all of the thermonuclear weapons that have ever been detonated and the enormous energy striking the earth's surface every day from the sun is unquestioned.

These arguments do not take into account the thermodynamic difficulties of harvesting energy from such widely dispersed sources. By analogy, consider the oceans of the world, which contain more precious metals and more minerals than have ever been mined, but do not represent a realistic source of these treasures because of the dilute nature of the resource. Investments in wind, solar, and other alternative energies are appropriate for niche applications, but we should not be seduced by the wishful thinking that they represent a significant part of the answer to powering the grid of the future.

In order to have realistic energy sources, those sources must be concentrated. Fossil fuels met that test for hundreds of years and the energy of combustion from those fuels provided by the breaking and formation of chemical bonds powered the developing world. But the indiscriminate dumping of the waste from this combustion into the biosphere has imperiled the planet, increased the acidity of the oceans, and led to premature deaths for millions of people; and the resources are finite.

If we now contrast that situation with nuclear energy, we find that nuclear energy meets the test of being concentrated as the fissioning of one uranium atom is millions of times more energetic than the combustion of the carbon atom. It is truly ironic that one of the main concerns expressed by opponents of nuclear energy is that we don't know what to do with the waste! Remember, this country knows where all of its nuclear waste is located: it is protected, monitored and guarded; and it has never killed anybody! The characterization of nuclear waste being in a "dump" is incredibly inappropriate. Since our energy policy must address waste management issues, let us look at some potential nuclear waste.

I am holding in my hand a mock-up of a section of a nuclear fuel rod. I am removing a prototype nuclear fuel pellet from the rod. Four or five of these pellets provide all the electricity required by the average American household for one year. A successful recycling protocol could reduce the number of pellets to 4 or 5 pellets per person per lifetime. Surely, we are up to the challenge of dealing safely with four of these per person per lifetime. After we have recycled all we can, our energy policy must provide for a repository for what is left. Likewise, a repository will be needed for Defense High Level Waste. These may or may not be the same repositories, but we need them, so let's do it.

I emphasize a recycling protocol because it will be imperative that our energy policy as a matter of national security avoid tight supplies of uranium as many countries of the world turn to their only logical choice for electrical energy. Hundreds of new nuclear plants are in the planning stage worldwide. A 1993 treaty with Russia has provided high enriched uranium from former

Soviet weapons for blend down to make fuel that has produced 50% of our recent nuclear generated electricity. This treaty expires in 2013.

It is therefore, a requirement for our national security that we become leaders in reactor technology and recycling technology. We wouldn't buy 20 gallons of gasoline, put one gallon in the car, and pour the rest of it into the ground, but our current nuclear fuel policy is tantamount to doing the same thing. So our energy policy must support extracting maximum energy from our nuclear fuel.

I am not here to advocate for a particular recycling protocol. I am here to advocate for this country to urgently examine the potential options with a thorough RD&D program so that we understand what opportunities exist. Such a program will inform our future decisions as we aggressively pursue the best current technology to begin replacement of fossil fuel. This nation has a single facility capable of conducting such a program. That facility is H-Canyon and the associated assets existing at the Savannah River Site (SRS).

Small modular reactors (SMRs), fast reactors, and new reactor technology will supplement the current worldwide fleet of nuclear power stations and those currently being constructed or proposed as the world comes to realize the necessity of producing electricity with nuclear power. SMRs will provide the ability to "right-size" electricity production to meet the needs of developing nations, defense bases, and as replacements for hundreds of coal-fired generating stations of less than 300MW. The latter application is particularly attractive as the SMR would simply replace the current carbon emitting generation technology, easily connecting to the grid through established infrastructure. This application of SMRs should become a cornerstone of our energy policy. We have previously spoken about the wisdom of establishing an energy park at the SRS to evaluate SMRs and recycling protocols.

Concerns over safeguarding fissionable materials to prevent them from falling into the wrong hands are important considerations. One must ask, "are we safer as a nation and a world if the U.S. leads or follows in responsible nuclear materials management?" We cannot withdraw from technological leadership in nuclear energy and still expect to be defining the rules of the game with respect to nonproliferation.

This question bears directly on our national security and the security of the world. We simply cannot afford to be less than number one in nuclear technology and yet we are slipping further behind as we allow our investment to wither while others aggressively pursue a nuclear future. We now have two compelling facets of national security which are both served by leadership in the emerging nuclear technology fields, i.e., a secure energy supply and an effective nonproliferation protocol. Our energy policy must address both of these requirements.

With nearly one third of the world's population without electricity, we can expect a growing demand for services requiring more and more energy. These people have a right to expect their lot to improve and we cannot help them achieve that improved quality of life without helping them get the only energy that makes sense. We certainly don't want them to burn fossil fuels to get their energy.

Earlier, I said I was not here to advocate for a particular recycling protocol, but I want to emphasize, again, that we must have a national policy of thoroughly understanding what all of the options are. Much of the investment in such an approach is already in place at SRS. Please use it.

Thank you for the opportunity to speak on this vital subject.