Remarks -- Industry Panel -- COP21 PARIS

Ladies and Gentlemen, I am Don Wolf, Co-Founder and CEO of ARC. We are developing a 100 megawatt fast reactor, which we call the ARC-100. It is cooled by liquid sodium, and its fuel is a metal alloy of Uranium. Its technology derives directly from a fast reactor named the Experiment Breeder Reactor II or the EBR-II, which the US Government ran successfully for 30 years. Our design also draws from advances to the technology coming from the US Government's Integrated Fast Reactor program. Three members of our team held senior positions in the EBR-II program and these three plus a fourth were also involved with the IFR. In fact, bringing this incredibly important technology back to life is the dream and important motivator of the ARC team.

This morning I first want to tell you about 4 important performance features of the ARC-100. Then, I want to discuss its licensibility, and tell you why we think it is deployable in a time frame short enough to allow it to make a significant contribution to the climate change objectives of this conference.

First, the ARC-100's design elements combine to give it true inherent passive safety -- all without backup sources of electricity or storage of extra liquid coolant. Due to its importance, I want to explain some of the physics of this feature. Let's assume all electrical power to the plant is lost as happened at Fukushima. The sodium temperature increases beyond its normal range of 350-500 degrees centigrade. The temperature rise causes the metal structure of the reactor core to expand, and neutrons that would normally create new fissions begin to escape from the core without being captured by an atom of fuel. The rate of fission then declines, the temperature falls, and the reactor cools down to a stable temperature with no damage to the core. This phenomenon was conclusively demonstrated by the EBR-II. I want to emphasize that the core melt down that occurred at Fukushima would not have happened in an ARC reactor.

Second, the ARC-100 can drive down the cost of nuclear power. Its nuclear island is a very simple design that can be delivered at much lower cost than the traditional large light water reactor. Since sodium boils at about 900 degrees centigrade, well beyond temperatures in the reactor, the reactor operates at atmospheric pressure. So, the containment need not be a 12-inch thick forged steel vessel, but instead is a thin-walled stainless steel tank. Also, the inherent passive safety feature I just mentioned means the ARC-100 does not require multiple backup safety systems. Also, the reactor's 20 year refueling cycle eliminates onsite refueling equipment or onsite storage of spent fuel. And, economies result from the factory fabrication of major reactor components and a shorter construction time relative to traditional large reactors. In summary, the projected plant installation and electricity generation costs shown on the slide – which we believe we can achieve -- will make the ARC-100 highly competitive with other sources of power generation and by far the cheapest near term reliable source of carbon-free base power.

Third, the ARC-100 opens new doors in addressing the issue of nuclear waste. It is called a fast reactor because its sodium coolant does not substantially slow or reduce the energy of neutrons in the reactor core. As a result, the reactor achieves a more complete burnup of its fuel -- about 8-10% compared with 3-5% for most reactors today. Then, at the end of the ARC reactor's 20 year fuel cycle, the old fuel can be removed from its cladding and reformed into new fuel with little else done to it, except adding some more Uranium 238. In addition, we believe it will be possible to simply crush today's light water reactor waste and melt it directly into the ARC fuel. So, think about this. The ARC-100 will be a reactor that generates very little additional nuclear waste. In addition, it can serve as an incinerator of existing waste and generate base load power.

And fourth, the ARC-100 offers a comprehensive approach to prevent nuclear weapons proliferation. The fuel cycle design blocks improper diversion of reactor fuel to a bomb maker. The 20 year refueling cycle means that at no time will there be any fuel on the plant site other than what is in the sealed inaccessible reactor core 50 feet below ground. Also, there will be no equipment on the site to remove dangerously radioactive fuel rods from the opaque pool of hot sodium, and access to ARC's proprietary refueling equipment will be strictly controlled.

In closing I want emphasize the maturity of the ARC-100 design. We believe it should be licensable in a time frame that permits deployment in less than 10 years. The design is based on proven technology developed, tested and proven in the EBR-II program. All important technical and operational aspects of the ARC-100 have been fully demonstrated by the EBR-II, and test data is available for use in licensing. Also, and very importantly, our design requires no advances in materials science to deal with ultra-high temperatures or the highly corrosive effects of new fuels and coolants. Lastly, we note that a reactor based on our same technology (sodium cooled fast reactor with metal fuel) has in the past received a positive Preliminary Safety Evaluation Report from the US NRC.

Thank you.

I want to change the focus now and share with you my views on the difficulties that a private investor faces today in bringing an advanced nuclear design to market.

The basic research to create a new nuclear technology is near impossible to privately finance. In our case, the estimated $6 billion research effort was funded by the US government. And, with most of today's advanced nuclear designs much of the basic research was done in a national laboratory.

Doing analysis and modeling of the new technology and developing product plans and engineering drawings, each requires substantial funding, but it is a determinable cost with a clear time frame. There are venture capital firms today that will consider this investment.

Construction of the first of a kind small advanced reactor – assuming the reactor design is licensed and a power purchase agreement from a creditworthy customer is in place -- is probably financeable today most likely with a strategic partner.

But, in the US today, the biggest risk is the design license. The very large, uncertain costs and multi-year timing make this very difficult for a non-state entity to finance.