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## So What About the Greater Good?

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Technology transfer. We all think we know what it is, but let's remember what it isn't—cheap and easy! My company, IX Power, budgets approximately \$1 million in effort and cash just for technical validation, creation of a product requirements document and a product development plan for any new invention coming out of the lab. The principals at IX Power have been commercializing DOE innovations for over 20 years, so we have a pretty good idea of what it takes to create a real product out of a laboratory innovation.

In some circles, \$1 million is birdfeed. But, to most people it's not—not even to your typical angel or venture capital investor. To get involved in any project that will take a million dollars just to determine how to get an innovation ready for the market, investors need assurance they are going to get their money back, plus upside for their time and effort. That's why many innovations are left sitting on the shelf in our government and university labs. Investors want a return on their investment and they don't envision it coming from "science projects" tied up in a national lab.

Unfortunately, within those innovations shelved at America's best institutions are a lot of great concepts and tools that could lead to great things; things that could help humanity in the short and long run. But, because there is not an appropriate reason for the U.S. government to develop them (the government is not supposed to be in the business of building things it doesn't need) and no investor sees a large enough market and eventual return to support its development, hundreds of innovations are left to gather dust.

At IX Power, we are taking a different approach. We recognized that some things are just probably not destined to make a lot of money for anyone. But often these same innovations are valuable beyond a profit motive. We didn't want to wait to "make it big" at IX Power before we started allocating time and resources to bringing some of these "low profit" inventions out of the lab. So, at the same time we started IX Power last year, we made a commitment to start our own non-profit, non-governmental organization to commercialize needed but "orphaned" innovations: the IX Power Foundation. Think of it as akin to the Island of Misfit Toys: a place full of innovations, still wonderful and useable, but only appealing to a very small set of users and then only in very specific market applications.

The foundation was established to take technologies, projects, concepts, even ideas, out to the world where they can be put to good use. One excellent example is the NPHR project that Kris Kerns at Los Alamos National Laboratory has been working on. NPHR stands for Nuclear Power Plant Human Resources tool, a software program that allows users to model and analyze the workforce needed to plan, construct, operate, maintain and decommission nuclear power plants.

Peter Lyons, DOE Assistant Secretary of Nuclear Energy, presented a version of the NPHR software to the International Atomic Energy Agency (IAEA) as a gift last year. But, the IAEA is not in the business of commercializing software and investors are not likely to see its further development and distribution as a profitable venture. NPHR has a very limited target audience: countries that are considering incorporating nuclear power into their power-generation mix. The NPHR software can also be very helpful to countries and companies that already have nuclear power plants. But, the total addressable market is small if you are a venture capitalist or other investor evaluating the software strictly based on revenue potential. Yet, the software is needed. It needs to be further developed, refined, distributed and people need to be trained on how to utilize it to its fullest potential.

In 31 countries around the globe, 436 nuclear power reactors are being operated for electricity production in 2010 came from nuclear power. Today 65 new nuclear plants, with an installed capacity of 65 GW, are under construction in 14 countries. The nuclear power industry is growing. Despite the recent incident in Japan, many countries recognize that implemented properly, nuclear energy is still the cleanest, most environmentally friendly and

the least expensive method for creating electricity; so these countries continue to be interested in introducing nuclear power into their energy mix. This increasing global demand for nuclear power is creating challenges, however, and the industry needs to update and create a variety of new tools to keep up with the demand and those challenges: to build new plants, and re-evaluate and update existing ones, and it needs them fast.

One of the largest challenges facing the industry is a shortage of appropriately trained workers. In order to build secure plants and operate them safely, countries need to establish their own knowledgeable nuclear workforce; one that can build and maintain nuclear plants in the immediate future and one that will be there 60 years from now. Countries considering nuclear need to decide what workers are needed, when they are needed, and how to create a properly balanced pool of national talent to establish and provide for the future of their own nuclear power program.

Countries new to nuclear power can turn to equipment providers and consultants from other countries. These companies are helpful in many ways and can be a valuable resource. But, they may also face their own workforce vacuum and not be able to provide the necessary staff. Further, for any country investing in their own sovereign energy independence, it is not to their advantage to depend solely upon the services of a foreign company and that company's interests. Until now there has been no independent tool and set of services allowing countries to evaluate and create workforce plans to fit their own specific needs. So, even if the market for the software is not large enough to turn a profit, the NPHR tool is still needed.

NPHR is the kind of innovation that needs to get out there to do some good and so IX Power Foundation has adopted it as a "cause." We're not handing people a basket of fish to feed themselves; we're teaching them how to fish, and to do so safely. In September, we are sponsoring a conference in London that will introduce NPHR to those interested, teach them how to use it, and present speakers discussing all facets of workforce planning for nuclear power plants. The conference is being held on a cost-recovery-only basis. Why? Because NPHR just needs to get out there and be put to work.

Other projects the IX Power Foundation is taking on include creating a centralized repository for open-source codes used across the board in the nuclear industries, at-cost clean water projects for developing regions, standardization of generic regulations for building and operating small and modular nuclear power plants, and a "talent agency" for former DOE scientists, so they can continue to contribute in a meaningful way without having to open their own consulting business.

Are any of these projects signaling to investors that they have the potential to return a sizeable profit? Probably not and they probably never will. Will they be cheap and easy? That's doubtful too. Nor are any of these projects glamorous. But they are needed. Not sitting on the shelves, gathering dust. But out there ... and put to work!

*Deborah Deal-Blackwell is chairman of the IX Power Foundation. IX Power, the company, integrates established engineering and recent technical innovations to provide baseload power and clean water for developing regions and emerging economies around the world.*

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