

South Africa's Folly

The South African Cabinet's recent decision to stop funding the Pebble Bed Modular Reactor project is a self-defeating folly that dooms the majority of that nation's people to a hopeless future. In effect, the Cabinet has closed down a main avenue to future financial prosperity in the name of current cost-cutting.

No nation can prosper without a science driver, a challenging long-term mission, like President Kennedy's 1960s Apollo Program in the United States. Such a project multiplies the initial investment many-fold: Every dollar spent on the Apollo Project returned 10 dollars or more to the economy, by conservative estimates. And it educated and inspired millions of people around the world.

For South Africa, the PBMR is such a science driver, creating a mission for the South African nation at the frontiers of nuclear science and engineering. It put South Africa on the map as a leader of the coming revolution in power production: building a fourth-generation reactor that is meltdown-proof, affordable, mass-producible, quick to construct, and very suitable for use in industrializing the developing sector.

The governmental cost involved—a few tens of millions of dollars over the past 11 years—is not much, by big project standards, even for a developing economy. First-of-a-kind reactors necessarily cost more than later models will cost, coming off an assembly line. And by definition, such projects come up against unexpected and often costly problems. Whatever was spent, however, pales in comparison to the incalculably high loss to the future of the nation, by shutting down the PBMR.

The South Korean Model

South Africa could learn from studying South Korea's nuclear program. In 1958, after years of war, when the nation was in shambles and its population near starvation, the decision was made to put precious funds into developing from scratch a nuclear program, which would not begin to bear fruit for at least 20 years. The mission succeeded, as can be seen in South Korea's position today as

an exporter of nuclear plants, and a nation with a high per capita income. Had the South Korean government not taken that risk, of investing in the development of a then-new technology, it would not have rocketed from least-developed country status to a world industrial leader.

Nuclear vs. Malthus

There is no way to power a modern industrial economy without nuclear (and in the future, fusion energy). No other sources come near the energy flux density of these advanced power sources. Those who argue for windmills and solar will keep South Africa in poverty. It is no accident that the environmentalist movement worldwide was launched by the Malthusian oligarchs Prince Philip and the late Prince Bernhard of the Netherlands, who want to reduce world population down to 2 billion. South Africa and other developing nations are slated to contribute the lion's share of those 4 billion or so deaths required to satisfy Prince Philip and the renewables he advocates.

The de-funding of the PBMR (like the proposed de-funding of a Moon-Mars program and lack of nuclear investment in the United States), is a sure way to a new dark age. Likewise, throwing millions into useless so-called "green" technologies will only serve to keep the African continent in the dark.

The scientific way to compare power production sources is to look at comparative energy flux densities, in which nuclear power is many millions of times ahead of the alternatives, including gas and coal. Because of its energy flux density, nuclear power has a transformative capability for the physical economy, which renewables are totally lacking.

Think about it: Could you provide the high temperatures and cheap source of heat to liquefy coal with renewables? Could you feed all your people, and supply them with the 3 to 5 kilowatts of power per capita, necessary in a modern economy? Could you get to the Moon or Mars in a wind-powered rocket?

—Marjorie Mazel Hecht



Wind and Wickedness

To the Editor:

As a physicist (energy expert) and long-time environmental advocate, I applaud your efforts to educate the public about energy issues (e.g. Laurence Hecht, "The Astounding High Cost of 'Free' Energy," www.21stcenturysciencetech.com/Articles%202008/Energy_cost.pdf).

After talking to a lot of people about renewables (like wind power), my conclusion is that almost everyone has only a superficial understanding of this very technical matter. Additionally, the public and political perception of wind energy is being driven by special interest lobbyists, and by environmentalists who are well-intentioned but misguided.

My belief is that such complex technical matters should be based on science, rather than on inputs from those who stand to economically or politically profit.


The simple webpage where I have collected some pertinent documents is at <http://windpowerfacts.info>.

John Droz, Jr.
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The Editor Replies

We would add one crucial point of clarification: While some environmentalists could fairly be characterized as well-intentioned dupes, the character of the movement itself is fascist. The program of World Wildlife Fund founders Prince Philip and Prince Bernhard of the Netherlands, to reduce world population to below one-third present levels, remains the guiding policy and intention of the environmental movement.

It is an evil worse than Hitler, and has already claimed more lives, through denial of economic development, bans on life-saving substances such as DDT, and other premeditated actions of mass murder.



Doctors using cesium-131 radioactive brachytherapy "seeds," to treat prostate and other cancers. The Cesium-131 has a significantly shorter half-life than the two other isotopes commonly used for brachytherapy, allowing faster delivery of therapeutic radiation to the prostate gland, reduced incidence of common brachytherapy side effects, and lower probability of cancer cell survival.

Radioisotopes: The Medical Lifesavers That Congress Is Suppressing

by Christine Craig

**Part I
U.S. Radioisotope
Production and Use**

The use of radioisotopes for the diagnosis and treatment of disease is now a vital part of modern medical practice. Aside from a few simple treat-

The cost of the U.S. policy restricting radioisotope production and use can be measured in human lives lost. Reviewed here is the history of

another radioisotope, iodine-232. Tucker and Greene developed the first molybdenum-99/technetium-99m generator, and Powell Richards, also of Brookhaven, fostered its development for medical purposes. But in 1966, the laboratory bowed out of production, leaving the plant's facilities to two private companies, Mallinckrodt and

Join the Campaign To Save the U-233!

In the Winter 2009/2010 issue, Christine Craig outlined the devastating lack of medical isotopes in the United States and the deliberate Congressional actions to bury the nuclear feedstocks (inappropriately termed "waste") that should be used to supply valuable isotopes.

This letter from a retired national laboratory official lays out a plan to save and use these nuclear materials, and urges readers to contact their representatives to get behind a plan to save the U-233 for isotope use. The author's white paper, "Save the U-233! But How?," can be accessed in the links he provides in footnote 3 below.

To the Editor:

Thank you for Christine Craig's story on the history of isotope suppression ("The Medical Lifesavers That Congress Is Suppressing," www.21stcenturysciencetech.com/Articles_2010/Winter_2009/Isotope_Suppression.pdf). She has done a good job of capturing the history of uranium-233 and its potential benefits.

I was partly responsible for what she called the "highly publicized plans to extract the Th-229 from the U-233 before disposal" at the Idaho National Laboratory. I also tried unsuccessfully to use a small sample of the U-233 at Oak Ridge National Laboratory to recover enough Th-229 to complete the Phase III clinical trial for acute myeloid leukemia at Memorial Sloan Kettering Cancer Center. Though neither effort was successful, there may still be time to detour the down-blend train.

Congress terminated the project once before because of skyrocketing costs. Congress has incentive to do it again. Costs are still spiraling out of control. The

latest estimates I have seen are approaching half a billion dollars.¹

As for safeguarding the U-233, the Department of Energy was instructed in March 1997 to come up with a plan to place the U-233 in safe, permanent storage. The current estimated completion date of the U-233 Down-blending Project is 2021¹—or 24 years later. It would be interesting to know if these ongoing delays in providing safe storage of U-233 are acceptable to the current Defense Nuclear Facilities Safety Board.

DOE is doing what Congress has directed it to do. So, calls to DOE to save the U-233 fall on deaf ears. It is Congress that must act to terminate this down-blending project.

To that end, I have asked my senators and congressman to include the following language in the FY2011 Energy and Water Appropriations Bill for the Department of Energy:

"The Secretary of Energy shall direct that the Uranium-233 Material Down-blending and Disposition Project at Oak Ridge National Laboratory be terminated and that the uranium-233 be promptly transferred to safe, secure, interim storage at another DOE site."

The delegation is willing to listen.

This action would detour the current disposal path but not necessarily change the eventual down-blending. This approach has several advantages. First, it eliminates the urgency to do the down-blending at ORNL and the half-a-billion dollar price tag. Second, transfer to another DOE site places the U-233 in safe storage in a five-year time span, instead of ten years. Third, DOE can consider an alternative disposition path. Namely, they could consider chemical down-blending rather than isotopic down-blending, and still ship the material to the Nevada Test Site for safe, permanent storage.

The precedent for safe, permanent storage of chemically diluted U-233 was set with the U-233 from the Idaho National Laboratory. As part of the down-blending process, it would be possible for private industry to cover the incremental cost of recovering the thorium-229. With chemical down-blending, the U-233 would not be irretrievably lost. At the time the country decides it wants to pursue a thorium fuel cycle, the material

would be recoverable.

Fourth, by promptly removing the U-233 from Building 3019, ORNL can begin investing in its central campus, and create jobs for the future, rather than continue with dead-end disposition jobs.

Last, but perhaps most importantly, the U-233 remains the responsibility of DOE's Office of Environmental Management. This is critical because no other DOE Office is willing or able to accept the long-term liability for this material.

Transfer of the U-233 to another site will not be trivial or cheap. However, DOE is familiar with, and budgets for, transport and storage of Special Nuclear Materials. Also, retrieval of the U-233 from storage is currently part of the disposition plan. So, DOE has a precedent to guide them and a sounder basis for estimating its cost. In addition, costs for transport should be incremental and only a fraction of the current down-blend estimate.

This action doesn't eliminate the cost for final disposition. It does, however, eliminate the urgency to do the down-blending at ORNL. In which case, DOE's Office of Environmental Management can take the time to implement a more cost- and resource-conscious approach to final disposition. This should reduce the burden on annual Environmental Management budgets for disposal of this material.²

I have encouraged U-233 medical isotope and thorium energy advocates to contact their representatives—especially those on the House Energy and Water Appropriations Subcommittee—to support inclusion of this language.³ Political support from these advocates will be crucial for any chance of success.

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Notes

1. John Eschenberger, Assistant Manager for Environmental Management, DOE's Oak Ridge Office, in a presentation before the Energy, Technology and Environmental Business Association of Tennessee, April 29, 2010.
2. My arguments in support of this action are detailed in a white paper entitled "Save the U-233! But how?" which I included with my letter to Idaho Senator James Risch, requesting action on termination of the U-233 Project at ORNL.
3. Frank Munger's Atomic City Underground Blog, posted August 18, 2010: Campaign to Save the U-233 Stockpile, http://blogs.knoxnews.com/munger/2010/08/campaign_to_save_the_u-233_sto.html and EnergyFromThorium website, posted August 18, 2010: "Help Dr. John Snyder save the U-233!" <http://energyfromthorium.com/>