Letters

Reader Commentary

RE: "THE ENERGY INNOVATION IMPERATIVE" BY JOHN HOLDREN

In his article, "The Energy Innovation Imperative" (*Innovations*, spring 2006), Professor John Holdren makes a compelling case for a highly accelerated transition to the widespread use of alternative sources of energy in order to address two of the most fundamental challenges of our time: 1) reducing the geopolitical and economic vulnerabilities that result from the United States' over-dependence on foreign sources of oil; and 2) developing cleaner sources of energy that at the very least do not worsen—and hopefully can improve—the long-term health of our earth's environment, particularly with regard to global climate change.

As the Secretary of Energy, I strongly support Professor Holdren's view that innovation offers our best hope for addressing these twin challenges. Indeed, what is needed is a robust, aggressive national research and development effort (in the public and private sectors) that "over time, can reduce the limitations of existing energy options, can bring new options to fruition, and thereby can reduce the tensions among energy-policy objectives and enable faster progress on the most critical ones." But I would respectfully disagree with Professor Holdren's contention that the political leadership on this issue "remains missing," as well as his suggestion that the Bush Administration's response has amounted to empty rhetoric. I am grateful for this opportunity to provide some additional information and context.

Over the past several decades, a tremendous amount of federally-funded research has been done on countless new energy sources. In part, this is because, as Professor Holdren points out, there is no one solution—no "silver bullet"—that will break our economy's over-reliance on fossil fuels. But, while the possible solutions are many, the time has come to focus on pushing the most promising technologies forward at a more rapid pace. We must move more quickly from research to development to deployment. In short, we have to pick some winners. I'm not suggesting that the United States should pursue only one or two advanced technologies (the so-called "all our eggs in one basket" approach). But, we must focus in on a balanced suite of innovative projects that fulfill the promise of long-term energy security, and as importantly, result in nearer-term solutions to transform the market in the next decade or two. After reading his article, I believe Professor Holdren would agree with this approach.

And, in fact, this is exactly what President Bush's energy-related proposals

aim to do. The President's American Competitiveness Initiative proposes, among other things, an increase of half-a-billion dollars for next year for the Department of Energy's research budget, and a doubling over ten years. The complementary Advanced Energy Initiative proposes to increase funding for clean energy technologies by 22% this year. Our goal is to identify the technologies that could have the greatest impact on the marketplace in the relatively near future, and then really go after them with increased resources and aggressive timelines. In my view, such areas include: the development of commercially competitive cellulosic ethanol; advanced hybrid vehicle technologies; hydrogen fuel cells; solar photovoltaics; wind energy; and new technologies to burn coal for electricity production with near-zero emissions. And, to Professor Holdren's point about total budget dollars, this also means discontinuing some research programs that are either mature enough to be handled by the private sector or unlikely to have an impact.

I would also point out that we are wasting no time here. Critically important work is underway, and new projects and partnerships are being forged at present. Let me briefly describe two (of many) very recent examples.

In August 2006, the Department of Energy announced a $250 million Federal-funding opportunity for the establishment of two new Bioenergy Research Centers. Universities, national laboratories, nonprofit organizations and private firms—as well as consortia or partnerships – are all eligible to compete for an award to establish and operate a Center. The Research Centers will focus on high-risk, high-return approaches to developing energy-efficient and cost-effective methods for producing alternative fuels from biomass – including cellulosic ethanol, biodiesel, biofuels for aviation, hydrogen, and methane. Applications are due by February 2007, and additional information is available at: <http://genomicsgtl.energy.gov>.

In October 2006, the Department announced that it will provide over $450 million to support the deployment of carbon sequestration technologies in North America. The funds, which will span 10 years, will be used to validate that the capture, transportation, injection, and long-term storage of CO2 can be done safely, permanently, and economically to support the reduction of greenhouse gas intensity by 18% by 2012 and ensure that sequestration technologies will be ready for future deployment. Additional information about this and other sequestration projects is available at: <http://fossil.energy.gov>.

Let me close with this thought: picking winners and losers may not be the usual role for government. But, as Professor Holdren ably describes, the challenges that we face are too large and too important for a "business as usual" approach. What is needed is real leadership. And that means making tough choices, supporting those choices with meaningful funding and the very best scientists and engineers, and demanding results for the American people. This is precisely the type of leadership that President Bush is providing. And we can

all look forward to the benefits – to our economy, to our security, and to our environmental health and well-being.

—Samuel W. Bodman
U.S. Secretary of Energy
Washington, DC

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John Holdren's article in the Spring 2006 issue entitled "The Energy Innovation Imperative: Addressing Oil Dependence, Climate Change, and Other 21st Century Energy Challenges" should serve as a clarion call for dramatic action on energy policy. It provides a thoughtful analysis of the interaction of climate change and oil dependency, as well as summary of innovations in policy and management that should be undertaken. We can only hope that Holdren's analysis will stimulate action.

There are a few points, however, that perhaps deserve some additional emphasis. First, Holdren correctly characterizes climate change as the "800-hundred pound gorilla in the process of beating down the door." He notes the predictions of the climate models, as well as the accumulating evidence that many of the predicted effects are now observable. It perhaps bears emphasis that the consequences could be even more rapid and disruptive than Holdren recounts. The historical record shows that climate has changed rapidly in the past and there is the possibility that we may inadvertently cross a tipping point that moves the earth to a radically different climatic regime. The positive feedback effects from the loss of ice cover, the release of methane from tundra, or the disruption of ocean currents could bring about radical and rapid climatic change. In this connection, it is perhaps appropriate to consider that our climate system has not yet reached equilibrium with current atmospheric carbon dioxide concentrations and the evidence from a period with similar carbon dioxide concentrations in the Pliocene suggests that such equilibrium could involve both higher global average temperatures and sea level that is 25 meters higher than today. In short, Holdren's concern about climate change is amply justified.

Second, Holdren emphasizes the economic and international-security dimension of our dependence on foreign oil, focusing on the adverse consequences if the flow of petroleum were disrupted. I agree with his comments, but there is another dimension of that problem that perhaps should also be mentioned. World dependence on oil from the Middle East is large and is growing. Even in the absence of supply disruption, the payments for oil serve to strengthen countries that export terrorism as well as petroleum. It is fundamentally misguided not to take steps to limit the economic subsidization of our enemies.

Third, Holdren appropriately notes the many changes in U.S. policy that should be undertaken to respond to the dual threats of oil dependency and climate change. In this connection, it also deserves emphasis that aggressive efforts to harness change around the world will be essential. These are global problems that exceed the capacity of any one country to solve. The U.S. should be a pathfinder, rather than the laggard on these issues that it has been to date

Finally, I would reemphasize the underlying theme of Holdren's analysis. The linked problems of climate change and oil dependency do not have easy solutions. But our failure to address them promptly may leave our children and grandchildren a world that is distinctly less pleasant than the one we inherited. Our successors may indeed condemn us for our failure to grapple with these problems in a timely fashion. I can only hope that we listen to Holdren's call to arms.

—Richard A. Meserve
President
Carnegie Institution of Washington
Washington, DC

RE: "THE NEXT INNOVATION REVOLUTION" BY JAMES TURNER

"The Next Innovation Revolution: Laying the Groundwork for the United States" by James Turner documents an impressive thirty-year progression of enlightened government action that should be studied and understood by every citizen. The goal of policy in a free-market democracy should always be to create conditions that motivate private-sector actors to conduct their business in ways that benefit the nation as well as themselves. With the Bayh-Dole Act as a particularly elegant example, the innovation policy framework described here has been remarkably consistent in driving toward this goal.

While the focus of these legislative and program initiatives has been to enable closer working relationships among industry, universities and government, they have led to operational changes within each of the three sectors as well. But the global playing field for innovation continues to shift and pose new challenges. How well each sector can adapt to rapid change will be as important as how well they collaborate with each other in working toward the vision of a lean society with an improving standard of living.

In the early 1980's, U. S. firms were already beginning to dismantle their vertically-integrated organizations in the face of increasing global competition. As major corporate research labs were downsized or eliminated, their senior executives predicted that these companies would need to rely on universities more than ever.

Meanwhile, the major research universities were experimenting with tech-

nology licensing models. It was commonly assumed in these early years, especially among champions of aggressive technology transfer (often university trustees with business backgrounds), that licensing and equity in spinoff companies would become a significant new source of discretionary revenue. This baseline of financial security would make these universities less dependent on federal programs for ongoing support. And as regions around the country watched Silicon Valley they expected their universities to become robust new job-creation engines.

Today's reality is very different from these predictions. Turner notes that today "universities perform only 1.7 percent of industrial research, at a time when corporations are contracting out virtually anything that can be done cheaper and better elsewhere. This percentage has barely changed over the last 50 years." And despite the press attention given to the handful of blockbuster technology transfer successes that occur each year, nearly all university licensing offices operate at a net loss, requiring large annual subsidies just to provide a basic service for faculty inventors. New job creation has also been frustratingly slow.

Why has the "culture gap" persisted in the face of policy incentives to connect university research with commercial partners?

Industry felt the strongest and earliest pressure to cut costs in the face of increasing global competition. But rather than outsourcing research to universities, executives discovered they could eliminate this cost center altogether, at least for the near term. Pushing the technology envelope can be done through focused development and cross-licensing. Investment in fundamental research—with its long time horizon and ease of appropriability by others—seems like poor business strategy when the companies themselves are changing products, changing markets, or even changing hands every few years.

Research universities have not yet resorted to downsizing as industry has done. But the stress is increasing, as federal grants no longer cover the full cost of research. Postdoctoral and soft-money positions are proliferating to maximize research productivity per dollar. Except for the few academic superstars who can threaten to leave, wage growth is also under pressure. Universities are rushing to seek congressional earmarks and to offer their programs overseas under lucrative contracts. There is increasing concern that the volunteer peer review system for competitive federal grants is breaking down because the best scholars are too busy to participate and ethics can be fragile when funding decisions can make or break individual careers. Nevertheless, accepting proprietary, work-for-hire projects for industry is not seen as the solution. This is only partly a cultural issue. For example, the federal government advises universities that their "research exemption" from onerous export control regulation would be lost for all of their funded work if they accept even one such proprietary grant. This is an unacceptable risk since industry funding is still so far

below what is available from the government.

If a new policy framework can be crafted that addresses these barriers for universities and industry individually, then both sectors will be much better able to seize the opportunities created by new collaboration mechanisms. In that case the next innovation revolution will be a powerful and very positive force for regions as well as the nation.

—Christina Gabriel
Director, Innovation Economy Programs
The Heinz Endowments
Pittsburgh, PA

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In the spring edition article entitled "The Next Innovation Revolution," I find it heartening to hear James Turner's synthesis of the relevant issues regarding imperatives for innovation, including those for standardization as a critical path to economic success. His appeal for coordination is made persuasive by his comment that "those who learn these lessons first will have a tremendous competitive advantage."

One successful outcome of the National Technology Transfer Advancement Act is the migration of standards from hardcopies to digitized documents. The ability to quickly access standards from their publishers, as well as adding value such as search capability and linkages is now taken for granted.

Further advances are challenged by the diversity of the standards developing system in the United States. What is urgently needed now is a common language across the different industrial enterprises, and I agree with Mr. Turner that for this to be successful, digitization is the essential starting point. We also need a common "standard for standards," so data can be formatted and organized in ways that are generally understandable and easily retrievable. The advent of "smart standards" based on enterprise models is the leading edge in the sophisticated and dynamic management of technical information crucial to any successful innovations.

Mr. Turner astutely notes these benefits in his section on "Common Standards: Sharing Data in a Usable Form." Smart standards based on enterprise models would create a communication method not only for standards developers to exchange information about standards, but also for users of the standards to be able to retrieve any standard from any publisher via a common approach, providing seamless access to standards via all computerized systems. And this digitization will further connect all organizations to their value chains, providing immediate access to key elements of the standards without any human intervention. Human error and re-engineering costs will be mini-

mized, with concurrent harmonization of the metadata or bibliographic information about standards. ANSI, with the support of the federal government, can help harmonize and promote this initiative.

And Mr. Turner's implicit endorsement of organizations that are progressive in emphasizing and improving their Quality is also very encouraging. "Just in Time," "Best Practices," "Six Sigma," and "Lean" are not terms normally heard outside of industry. Promoting the NTTAA ideals, the Baldrige Criteria, and challenging our country to move beyond supply chains to value chains and ultimately a "Lean Society" could not be more important today. The advantages of opening federal procurement to commercially available innovations should be self evident to any taxpayer.

So Mr. Turner's call to extend quality to other areas is very apropos. Much more work needs to be done to promote innovation in the educational community. Although work has been done to support and incubate innovations in colleges and universities around the country, insufficient effort has been made to integrate standards and their contents into the curriculum of science and engineering, especially at the graduate level. The article eloquently resonates on not only the imperative but the ability of the government to fuel innovation across the public and private sectors.

—Lane Hallenbeck
Vice President of Accreditation Services
American National Standards Institute
Washington, DC

RE: "INCOME IS DEVELOPMENT" BY MARTIN FISHER

As the founder of International Development Enterprise (IDE), the organization that started popularizing treadle pumps in Bangladesh twenty-five years ago, I am delighted to have a chance to comment on Martin Fischer's paper. I would like to focus on three things.

I very much agree with Martin that increasing income is the single most important first step out of poverty for the 1.1 billion people who survive on less than a dollar a day.

I applaud KickStart's success in helping thousands of very poor farmers in Kenya and Tanzania move out of poverty by increasing their income with treadle pumps purchased from private sector supply chains. This provides a much needed model of success for sub-Saharan Africa.

I would like to examine the remarkable global impacts that more than two million treadle pumps have made in the hands of dollar-a-day poor rural people, and explore what we can be learned from this experience that we can apply

Donor investment in TP initiative	$12 million
Smallholder investment in TP	$37.5 million
Annual net smallholder return on investment	$150 million

Table 1. Impact of Treadle Pumps (TP) in Bangladesh
Source: International Development Enterprises (IDE)

more broadly to poverty eradication initiatives.

The most important point Martin Fischer makes is that "if you ask a person in a poor place what they need most, they will tell you that it is a way to make more money." I couldn't agree more. Over the past twenty-five years, I have had long conversations with more than three thousand farmers who earn less than a dollar a day, and walked with them through their fields. When I ask them what they need most to move out of poverty, virtually all of them say that the most important thing they need is to find ways to significantly increase their income.

Martin describes his disappointment when he surveyed the appropriate technology movement in Kenya in 1985, and had to conclude that the movement was essentially dead. Twenty years ago, I talked to a bright young man who was part of a team of people developing a tool carrier for farmers in Africa. He was convinced this new technology would be a major breakthrough, because it would carry out all of the functions of plows, cultivators, seeders, harrows, and carts, all with one basic tool. I had already talked to a lot of small farmers by then, so I asked him a simple question: "How much will it cost?"

He scratched his head, and said he thought that was an interesting question. He said he would make some calculations and get back to me. Right then I knew that the tool carrier would never work. If you think like a tinkerer solving a technical problem, you will likely be able to come up with a technical solution. But if you don't design it for poor people as customers, it will likely never be adopted. The first step in design for the poor is identifying the critical affordability price point at which poor people become willing to vote with their feet to buy it. To me, that was the tragedy of the appropriate technology movement. E. F. Schumacher's book *Small is Beautiful* inspired thousands of gifted people around the world. The tragedy is that the appropriate technology movement it inspired was implemented by technical tinkerers rather than hard-headed entrepreneurs who design for the marketplace.

If you think of the poor as recipients of charity instead of as customers, you invariably design goods and services that are too expensive to be affordable for them as customers. Effective tools have to be customer driven and market driven if they are to have any hope of being brought to scale. The key reason that treadle pumps have had such a remarkably positive impact on poverty in many countries is that their design was shaped and hardened by disciplined customer

Organization	Country	TP Sales to Date	Current Annual Sales	Total Sales to Date
IDE	Bangladesh*	1,567,987	40,000	**2,071,763**
	India*	353,542	15,000	
	Nepal	100,000	10,000	
	Cambodia	38,578	1,200	
	Myanmar	7,000	7,000	
	Zambia	4,656	800	
KickStart	Kenya	33,956	4,062	**65,389**
	Tanzania	16,010	3,589	
	Mali	854	691	
	Exported	14,569	7,171	
EnterpriseWorks**	Senegal	600	N/a	**17,181**
	Tanzania	131	N/a	
	Niger	1200	N/a	
	Burkina Faso	15,250	N/a	
Government of Malawi***	Malawi	50,000	N/a	**50,000**
TOTAL				**2,204,333**

Table 2. Global Treadle Pump Sales
*IDE's TP project ended in Bangladesh in 2003 and in India in 2004, but private sector sales in these countries continue
**Numbers compiled from EnterpriseWorks' website (www.enterpriseworks.org)
*** Personal communication, Ministry of Agriculture of Malawi, 2005. Another 80,000 pumps on on order.

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feedback, and their marketing and distribution by the private sector around the world was shaped by the poor customers who voted with their feet to buy them.

I applaud the success that Martin Fisher, Nick Moon, and KickStart have had in helping more than 65,000 very poor families in Kenya and Tanzania move increase their income by purchasing and installing treadle pumps, as well as increasing the income of enterprises making, distributing and installing them. Kickstart accomplished this by adapting the treadle pump technology widely disseminated by IDE in Asia to the specific conditions of Kenya, and establishing effective local private sector distribution and marketing systems.

As has now been thoroughly demonstrated in many developing countries, the income-enhancing impact of treadle pumps comes not from the technology alone. Rather, treadle pumps are effective because small farmers need affordable water control for their crops in order to switch from subsistence crops to labor-intensive high value crops, like fruits and vegetables that they grow for the market.

The impressive leverage KickStart obtained by using treadle pumps to stimulate increased smallholder income through growing and selling cash crops mirrors IDE's earlier experience in Asia. Here is an example of the leverage obtained from donor investments in IDE's treadle pump program in Bangladesh, which began in the mid-1980s.

Here is a brief overview of the remarkable global impact that the treadle pumps, a single affordable irrigation technology, has had on the lives of poor people worldwide. Since Gunnar Barnes and his colleagues at the Rangpur Dinajpur Rural Service (RDRS), supported by Lutheran World Service, introduced treadle pumps in Bangladesh in the late 1970s, and IDE launched its global marketing and dissemination initiative in the 1980s, some 2.2 million poor rural families in developing countries have purchased and installed treadle pumps. The impact of these treadle pumps on the net annual income of smallholders exceeds US$220 million a year, not counting the increased income of private sector supply chain enterprises making, selling, and drilling wells for treadle pumps.

Because profitable private sector supply chains are designed to be the instruments for putting the technology in the hands of small farmers, they continue doing so after formal project funding is terminated. The private sector continues to sell and install 55,000 treadle pumps a year in Bangladesh and India after IDE's and development donors support for the program terminated. The multiplier impact on the economies of developing countries is already in the range of $1 billion a year or more. All this is from one single affordable water lifting technology customized for small farms!

Why has this single affordable small plot irrigation technology been so successful? Over the past 15 years, many people have told me that IDE was very lucky to have stumbled on the treadle pump. They said that this is a unique technology, and we will never find another one like it.

I totally disagree. I believe that the biggest impact of treadle pumps is not the increase in income for the 5 to 10 million families in the world who are likely to install one. Instead, it lies in what we can learn from the treadle pump experience that is applicable to ending the poverty of the 800 million people who survive on less than a dollar a day, and earn their living from tiny farms.

A fact that has never been effectively incorporated into development theory and practice is the remarkably small size of the farms where most of the families who earn less than a dollar a day make their living. Farms under two

hectares represent 98 percent of the farms in China, 80 percent in India, 96 percent in Bangladesh, 88 percent in Indonesia, 95 percent in Vietnam, 87 percent in Ethiopia, 74 percent in Nigeria, 75 percent in Tanzania, 90 percent in Egypt, 98 percent in Russia, and 99 percent in the Ukraine (Nagayets 2005).

More importantly, average farm sizes in developing countries have been rapidly *shrinking*. Average farm size in China went from 0.6 ha in 1980 to 0.4 ha in 1990; in India from 2.3 ha to 1.4 ha between 1971 and 1995; and in Ethiopia from 1.4 to 1.0 ha between 1977 and 2000 (Nagayets 2005). This is *average* farm size. The size of farms where dollar-a-day people earn their living is much smaller—closer to one acre divided into scattered quarter-acre plots.

If increasing the income of poor people is the first step out of poverty, then the obvious place to start is to increase the income the 800 million or so people who now earn less than a dollar a day from one-acre farms. While most small farmers put a high priority on growing enough food to keep their families from being hungry, the notion that they should grow surplus rice, wheat, and corn for the market suggests that they should compete in the global marketplace with Western wheat farmers who farm 3,000 acres with combines and generous government subsidies. This is clearly untenable.

To take the first step out of poverty, one-acre farmers need to play to their strength in the global marketplace, and that is the lowest labor rates in the world. Their path to increased income is to grow marketplace-driven, high-value, labor-intensive cash crops. This requires two things:

- Access to a whole new range of affordable small plot irrigation devices, delivered by private sector supply chains.
- Access to markets for diversified high value cash crops, delivered by private sector value chains.

The treadle pump is only the first of a whole new range of affordable water lifting, water storage, and water distribution technologies that need to be developed to fit the income generating needs of small farmers. For the past ten years, IDE and others have worked to developed affordable small plot irrigation systems. Some 200,000 have already been purchased, and I believe there is a global market for at least 20 million of them. Other affordable small plot water technologies likely to have very large global demand include affordable sprinkler systems, enclosed water storage units, efficient surface delivery systems, and micro-diesel pumps. The most important thing that we can learn from the treadle pump experience is how to design affordable, customer driven small plot irrigation technologies, and how to deliver them in large numbers to small farm customers through private sector supply chains.

During the late 1980s, when farmers who had installed treadle pumps in Bangladesh did so well, everybody at IDE believed that all a small farmer needed to move out of poverty was to buy and install a treadle pump. At the height of the integrated rural development movement I even wrote a paper called

"Segregated Rural Development," which touted treadle pumps as the answer to rural poverty. Later on, we found we could apply our intensive rural marketing techniques to convince small farmers in the hills of Nepal to invest in low cost drip-irrigation systems. But the farmers ended up not using them much, and sales went down.

These were maize and millet farmers who had never grown vegetables, and we had to implement a crash course in intensive horticulture to train them to switch effectively from growing grain crops to producing off-season cucumbers and cauliflower for the Kathmandu market. This made them a lot of money, and sales of low cost drip systems took off. But farmers further away from the road needed help to link up with traders who would buy their vegetables. This made it clear to us that the process of generating new income for poor farmers must start with an evaluation of the markets where they could sell what they grow, and a recommended list of four or five high-value crops that farmers could likely grow in their area, and sell in the markets they had access to.

I believe that 500 million of the 800 million dollar-a-day people in the world who earn their living from farming could move out of poverty by switching to high-value, labor intensive crops, gaining access to the markets where they can sell them through private sector value chains, and gaining access to the affordable irrigation tools, seeds, fertilizer, and credit they need to grow them through private sector supply chains. This is a far cry from a singular focus on treadle pumps, but it is the remarkable global success of treadle pumps that has opened the door to learning about the practical path to increased income for millions of impoverished rural people.

—Paul Polak
President and Founder
International Development Enterprises (IDE)
Lakewood, CO

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RE: "EXPANDING POSSIBILITIES AT THE BASE OF THE PYRAMID" BY ERIK SIMANIS AND STUART HART

I have three comments on a great paper by Erik Simanis and Stuart L. Hart:

1) *Seismic shift.* Although there is a shift in the thinking of the way to deal with development in developing countries, to state that the shift is seismic perhaps over-represents the truth. The development mental model remains somewhat stuck to the same style of doing things without much learning. Yet, there are few case examples of success in the so called poor countries. These cases are few, but very encouraging, and their stories must be told. There is no seismic shift yet, we have not reached the tipping point. We are very hopeful, however. With efforts similar to KickStart's a change in development mental model is certain. KickStart's work is just awesome.

2) *The poor.* The term "the poor" has no meaning in reality; it is loaded with many assumptions and has a condescending quality, and undertones in itself. The term was developed and promoted as a business concept by agencies trying to, or doing charity business in countries other than U.S., Europe, and Japan. Indeed, 'the poor', and associated terms, such as "poverty alleviation", are promoted by the certain groups of individuals as a core business model, most, if not all of whom, sell poverty for money. The Poor, and Poverty Alleviation arguments do not have a place in *Innovations*, and are best left out from the first issue of the journal.

3) *Real options vs business model.* The discussion about real-options is great, and it brings into light a great mechanism of making capital decisions in the BoP. Real-options is a capital strategy, however, and does not preclude the need for innovations in the business strategy. A company/organization will need a business strategy, as much as it needs a capital strategy. Recall that capital decisions are concerned about capital acquisitions, and creating value for that capital. Simanis and Hart are saying that the traditional financial strategies which look at return on investments for shareholders are not amenable to the highly uncertain BoP market. An innovative real-option strategy is thus more appropriate method of making capital decisions, since unlike traditional financing strategies, which are deductive in nature, the real options are inductive in nature, and allow the company to get out of non-performing projects, using that information as a learning process. This inductive process is highly appro-

priate for the BoP market where there is not much market intelligence available for investors to make market deductions. The real-options strategy however, which is a capital acquisition decision process does not replace the need for innovation in business model, which addresses the way the business deals with the market per se. It is important perhaps to make that distinction on the paper.

—Dr. Macharia Waruingi
Boston, Massachusetts

RE: "EVERYONE A CHANGEMAKER," BILL DRAYTON

What are the boundaries of the three major economic classes Mr. Drayton posits: business (for profit), government and social? Where do the charitable classes of foundations, charities, religious outreach groups fit in? Does Mr. Drayton envision social organizations migrating to the business or government sectors as they mature, where appropriate? For example I remember reading about a scheme to bring electricity to the rural areas of Brazil. Might such an idea become a candidate for the business sector?

Are social enterprises essentially altruistic? If so, I think that would probably rule out patents, copyrights, business secrets and infringements. Mr. Drayton writes about the opportunities for financial institutions to make a profit in the social sector by helping social startups. I think they would insist on sound business plans and maybe some sort of collateral to reduce the lender's risk.

—Don Searles
San Diego, CA.

* * * *

Since an eight month period abroad observing NGO, State and Private actors I have been searching for the words to capture what I saw was missing and what I recognized, simultaneously, to be so desperately needed in the regions I traveled (Bosnia, Croatia, Azerbaijan, primarily). The class I was looking for was that of the social entrepreneur.

My first thought as I closed "Everyone a Changemaker" was of the potential value of social entreprenuer consultants. Drayton writes of the three-stage lifecycle of the citizen sector, and notes that in many areas/regions/countries the "post-breakeven" mature phase is never reached because the "citizen base is entirely inadequate". Drayton continues to note that a "broad base of citizen support" must be built ... the challenge is to "jolt the citizen sector". It seems to me, therefore, that Drayton is calling for Ashoka ambassadors-consultants,

perhaps, who can inspire, catalyze and empower potential actors to drive the financial vehicles available to them.

—Amanda Leese
Washington DC

RE: "GENOME AND NATION: ICELAND'S HEALTH SECTOR DATABASE AND ITS LEGACY" BY DAVID E.WINICKOF

Kudos to David E.Winickoff for his treatment of the influence of the deCode Genetics controversy on the international development of biogenetics norms. His broad account of "state-science-market" factors on a domestic as well as an international level provides a revealing example of how ethical and legal debates are formed and sometimes deformed under the winds of change and circumstance. The foreign policy implications of his account are of no less import, as developing countries "look to the frontiers of the life sciences, both scientific and ethical, as opportunities and vehicles for nation building."

—Sarah M. Brownsberger
Hafnarfjordur, Iceland

We invite reader comments. Email <editors@innovationsjournal.net>.