The Great Shift: Moving Beyond a Fossil Fuel–Based Economy

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In this article, we call for a "great shift" away from the fossil fuel–based economy upon which Hawaiian livelihoods rely. Our over-reliance on fuel sources that cause tremendous environmental harm does not align with the principles that have sustained our people and lands for generations. We also examine neoliberal capitalism as it functions within the fossil fuel–based economy. This article: (1) sketches the scope of the Peak Oil problem and demonstrates the urgency for Kānaka Maoli (Native Hawaiians) to specifically confront these issues as a Hawaiian problem, and (2) highlights the tensions in Hawai'i between community-based and neoliberal transnational corporate capitalist approaches to these coming economic and environmental shifts.

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Hūlili: Multidisciplinary Research on Hawaiian Well-Being Vol.8 (2012)

I ka moana nō ka iʻa, liuliu ʻia nā pono lawaiʻa.
While the fish are still in the sea, get your gear ready.

—*ʻŌlelo Noʻeau* (Pukui, 1983, p. 129, no. 1184)

Empires of the 20th and early 21st century have been fueled by oil, but oil is a finite resource. As we will discuss in more depth below, the term "Peak Oil" has become a shorthand way to reference a historical moment when the world's total annual oil production no longer grows but instead begins a long and unending decline. This article has been deeply inspired by the work of our Dakota sister Waziyatawin who shared her groundbreaking work on Peak Oil's implications for indigenous people during a two-week intensive seminar bringing faculty and students of the University of Hawai'i's Indigenous Politics program together with the University of Victoria's Indigenous Governance program. It was during this course that the coauthors of this article first read Waziyatawin's essay "Indigenous Survival in the Coming Collapse" and began to realize the urgency of the problem. She called us to consider the incompatibilities between our own ancestral values systems and lifestyles with our present over-reliance on the exploitation of fossil fuels. In the essay, she asks:

> Do we still cherish the land as our mother, or do we see her today as a resource to be exploited for economic development? Do we still envision ourselves as protectors of the land, or have we fallen prey to a belief in our own helplessness?[1]

In person, she asked us to consider another question which resonated with a couple of basic principles many of us ʻŌiwi (natives) have been taught since childhood: leave a place cleaner than when you got there, and always give as much, if not more, than you take. When we pass into the next realm, will we have left our islands and our earth a cleaner place than when we were born? Will we have planted as much as we have consumed?

From our co-participants in that seminar, we learned about the heavy environmental toll on their indigenous lands that our collective over-dependence on oil, coal, and natural gas perpetuates. We were also inspired by the knowledge that our

own indigenous land-based cultures and economies were developed to balance human health with the health of our nonhuman relatives. In subsequent conversations, the coauthors of this article began to ask: Are we adequately preparing ourselves for the future conditions of oil's decline? Are our people sufficiently dealing with the fact that the kind of economic growth produced in the 20th and early 21st centuries in Hawai'i is fundamentally unsustainable (in part because it relies on the accessibility of fossil fuels)? Are we protecting the future of our lāhui (nation, people) if we remain wholly dependent upon and apathetic to the dominant corporate capitalist economic systems? Is deriving most of our basic needs—our pono (balance, goodness, wellness)—from such an extractive economy consistent with our kūpuna (ancestors') values?

Hawaiian well-being must be seen in light of our long-term survival as a people over generations and centuries. For hundreds of generations, Kanaka Maoli (Native Hawaiian) health has been fostered by detailed observation of the natural resources that sustain life. The 'ōlelo no'eau (proverb) above expresses the forethought of our kūpuna: be aware of environmental conditions and prepare. This simple yet profound instruction can be interpreted in terms of both environmental and related social and economic conditions. Consider, for example, the forethought of our kūpuna of the 19th century who gave us millions of pages of their 'ike (knowledge), produced while they were dealing with a massive population collapse. They understood the urgency of their situation, and they acted to preserve a vast legacy for us in subsequent centuries. Their ability to see their pulapula (descendants, offspring) in the future, to think about us and care for us across time, should be our model. We similarly need to look at the conditions and challenges of our time and plan accordingly for the collective health of our 'āina (land) and lāhui into the 22nd century and beyond.

In the second decade of the 21st century, we face profound environmental and economic changes within a generation or two. The period in which we in Hawai'i have lived under the U.S. empire corresponds almost exactly with the time in which abundant oil and natural gas stores were exploited to literally fuel an era of intense wealth accumulation for some nations and depletion for others. In the 1900s, fossil fuels radically changed American society: automobiles, jet aircraft, fertilizers for industrial agriculture, manufactured goods derived from petrochemicals, and the seemingly limitless mobility of products across oceans and continents. All of this has been possible because of oil and, to a lesser extent, coal and natural gas. Kānaka Maoli too (no matter what nationality we claim) have become largely dependent

on a fossil fuel–powered capitalist economy dominated by transnational corporations. We are both injured and benefited by this economy. Take a look around your house at the food, medicines, cars, home appliances, toys, phones, clothes, toothpaste, beer, and everything else. Fossil fuels are used to produce, pack, transport, market, and power the majority of things most of us use on a daily basis.

Over the last century humans—primarily those living in the "developed" nations of the First World or "Global North"—have consumed about half of the earth's nonrenewable fossil fuel resources. In the context of both Hawaiian and human history, the consumption levels this exploitation has enabled are wildly abnormal. American and European critics have euphemistically referred to this period as the "age of exuberance" (Catton, 1980) or "the greatest banquet in history" (Heinberg, 2010, p. 26). Native and other critical scholars have pointed out that this era should also be described as an age of ongoing imperialism. Presenting a "Basic Call to Consciousness" in 1977, Haudenosaunee authors and leaders offered an international wake-up call against the destructive practices of Western industrial extractive technologies (Akwesasne Notes, 1986). It was the same year that George Helm, inspired by a similar commitment to protect the sanctity of living ʻāina wrote, "We are against warfare but more so against imperialism," as he lay on the rocky earth of Kahoʻolawe (Morales, 1984, p. 72).

The problems of Peak Oil are poised to negatively affect our people disproportionately, since people with lower incomes feel a greater pinch when the costs of gas, food, and manufactured goods rise. In this article, we argue that if we, Kānaka, do not begin *immediately* making a great shift, weaning our children and ourselves from our dependence on fossil fuels and the economy powered by them, we will fail to live up to our kuleana (responsibility) to our kūpuna o ka wā i hala (ancestors of generations past), our hanauna hou (coming generations) and our ʻāina. As a people, it is our kuleana to prepare our collective intellectual, spiritual, and material "gear" for the coming realities of an unrelenting decline in the fossil fuels upon which the dominant economy, and thus our livelihoods, rely. This great shift will require much more study, discussion, and planning. This article is only intended to be a humble beginning for such a conversation.

As ʻŌiwi scholars who study politics, we are concerned with the ways power, wealth, and decision-making will be distributed as the shifts precipitated by Peak Oil take place. While we draw on existing research from the natural sciences on the geological aspects of oil decline, we do not claim to prove whether or not our societies have yet reached the peak of oil production. Rather, we aim to do the

following: (1) sketch the scope and urgency of the Peak Oil problem generally and demonstrate why Kānaka Maoli are likely to be disproportionately and negatively impacted; (2) explore the tensions between community-based and transnational corporate capitalist approaches to addressing the coming economic and environmental shifts by drawing on Baker's empirical research on Moloka'i; and (3) propose some initial points for further discussion, research, and action around envisioning and creating more pono economies that can nurture the health of our lāhui and 'āina.[2]

Affirming and Strengthening Economies, Not "The Economy"

We find it useful to begin by disrupting popular, hegemonic language that defines "the economy" only in terms of a market-based economy dominated by transnational corporations. Similarly, "the future" is often represented and imagined in terms of the inevitable expansion and continued growth of that economy. Categorical terms such as the economy and the future are often mobilized to refer to a singular, Western-derived vision.[3] Against that trend, we argue for the need to open our field of vision to understanding economies and futures as fundamentally plural.

The term "economy" emerges from the Greek *oikonomos*, one who stewards the resources of a household, dwelling, or village. In modern English, economy can refer to both the wealth and resources of a place, as well to the systems by which that wealth is produced, managed, and circulated. Our own Hawaiian terms, *hoʻokele waiwai* for economy and *noʻeau hoʻokele waiwai* for economics, vividly illustrate that an 'Ōiwi view of economy is grounded in the skilled stewardship and direction of valuable resources.

Why is it problematic to reduce these broad ways of thinking about economies to a monolithic, market-based notion of "the economy"? Physicist, environmental activist, and author Vandana Shiva argues that "the reduction of the visible economy to the market and activities controlled by capital" causes myopic thinking and action (Shiva, 2005, p. 14). By focusing only on monetary value, cost, and profit, we obscure the productive and life-sustaining capacities of other systems. Shiva asks us to think instead about three kinds of economies: nature's economy, sustenance economies, and market economies.

The productive capacities of our world's complex ecosystems can themselves be thought of as economies—*nature's economies*. Shiva argues that the natural economy is "the primary economy on which all other economies rest" (Shiva, 2005, p. 16). Our ancestral Hawaiian worldview is based on a similar recognition of the creative and nurturing power of our ʻāina as the foundation of life. Drinkable water, fertile soil, fruit-bearing trees, and all forms of natural energy sources are produced through the organic productivity of our ecosystems. To view such things narrowly as marketable products or resources leaves vast aspects of the creative capacities of nature beyond the scope of conventional economic thinking.

Similarly, within dominant media and popular discourse, references to "the economy" or to "economic development" do not account for *sustenance economies*. As Shiva writes, "In the sustenance economy, people work directly to provide the conditions necessary to maintain their lives…without the sustenance economy there would be no market economy." For the vast majority of Kanaka Maoli existence, we have lived and maintained optimal health by balancing the natural and sustenance economies. The innovations of our kūpuna, such as the ʻauwai (irrigation ditch), loʻi (irrigated terrace), and loko iʻa, (fishpond) are all technologies that heighten the productivity of natural and sustenance economies. Unfortunately, in our world today "the market makes invisible nature's economy and people's sustenance economies" (Shiva, 2005, p. 14).

Markets are a relatively new introduction to Hawaiian economic production. Shiva makes a key distinction between markets in general, and "*the market*" within neoliberal capitalism.

> Markets are places of exchange…based on direct relationships and face-to-face exchange…an extension of society. When markets are replaced by *the market*, society is replaced by capital and the market becomes the anonymous face of corporations…cultural spaces of exchange are replaced by invisible processes…the market becomes the mystification of processes of crude capital accumulation… It is this disembodied, decontextualized market which destroys the environment and people's lives. (Shiva, 2005, pp. 18–19)

Within a capitalist economy, the market survives and grows by consistently drawing in resources from outside its current scope of operation, and it externalizes the costs on the sustenance and natural economies as the basis for generating profit. In this era of declining oil, the commodification of wind power is one example of the ways in which a corporate-driven market economy seeks to bring new natural resources into its frame. Profit-taking or the accumulation of capital drives the market economy.

Polanyi characterizes the market economy as "an economic system controlled, regulated, and directed by market prices" (Polanyi, 2001, p. 71). In other words, in a capitalist economy prices are attached to all elements of production including human labor, land, and natural resources. The worker derives income from selling labor power to the capitalist. The financier derives income from selling money to the capitalist. The owner of land derives income from the rent extracted for its use by the capitalist. And the capitalist derives income from profit (price of goods minus the price of labor, land, money, and any other costs associated with producing the goods). The concept of private property is essential to economic productivity within a capitalist system because you cannot sell something you do not own. Thus, the market economy will tend to drain resources, including human labor, from the natural and sustenance economies without regard to the costs or imbalances caused. It seeks to enclose and commodify as private property those resources that were previously accessible to a collective group of people.

In the last several decades, large countries and multinational corporations have advanced the spread of a brand of capitalism and associated government policies often described under the umbrella term "neoliberalism." In his essay, "Western Colonization of the Future," Ziauddin Sardar (1999) argues our futures are being colonized by the global spread of neoliberalism—an approach to economic and social policy based on market expansion, deregulation of trade, and maximizing the role of private business interests over democratic publics. Geographer and anthropologist David Harvey explains that neoliberalism is "a theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong property rights, free markets, and free trade" (Harvey, 2007, p. 2).

A key political question for any nation to determine is the regulatory function of its government. This can include the prevention of overuse of particular natural

resources. For instance, traditional Hawaiian kapu (regulations) were often specifically intended to balance human use with ecological health. In contrast, neoliberal policies are primarily designed to protect the free flow of capital, mostly controlled by powerful corporations. Under neoliberal legal regimes, corporations enjoy many of the protections of nation-states without the same kinds of accountabilities, and territorial boundaries are loosened so capital can flow more readily across national borders. Transnational corporations exist to increase their own profits. Thus, ecological and social concerns are secondary to the primary purpose of accumulating wealth.

Neoliberalism is also characterized by the saturation of market-based language and ideology to shape various aspects of life. One example in the field of education is the move to think about schooling as a business (leaders as *CEO*s, students as consumers, reforms based on market models of choice and competition, etc.). Sardar writes that neoliberalism and the ascension of the market over other ways of viewing economies and futures promotes

> a dominant set of cultural practices and values, one vision of how life is to be lived, at the expense of all others, and it has serious practical consequences: Not only does it erode Non-Western local traditions and cultural practices, but it kills non-Western future options...the future is locked into a single, linear projection. (Sardar, 1999, p. 112).

The spread of neoliberalism has exacerbated the problems of imbalance between the aforementioned natural, sustenance, and market economies, so much so that dominant representations of the future rarely envision a world that is not structured by the continued expansion of transnational corporate power and reach. This is significant because it forecloses new and creative ways of thinking about and creating our futures in ways that are more balanced and healthy.

The expansion of neoliberal, corporate capitalism has been fueled by the profligate use of oil, a unique product of the natural economy. This imbalanced growth has not only made these other more foundational economies invisible but has actively diverted wealth and weakened the productive capacities of the base economies that allow for our survival. We have seen this play out in our own islands in numerous communities, for example through struggles for water

to feed streams, subsistence farms, and fisheries, or to supply corporate-owned resorts and housing developments. If we are to practice no'eau ho'okele waiwai, we must attend to the ways wealth, value, and energy are created, organized, and directed within our society. Furthermore, we must be fully informed about and prepared for significant changes in the supply of resources upon which our lives have become dependent.

Confronting the Challenges of Peak Oil: The Scope of the Problem

We should not cling to crude down to the last drop—we should leave oil before it leaves us. That means new approaches must be found soon....The really important thing is that even though we are not yet running out of oil, we are running out of time.

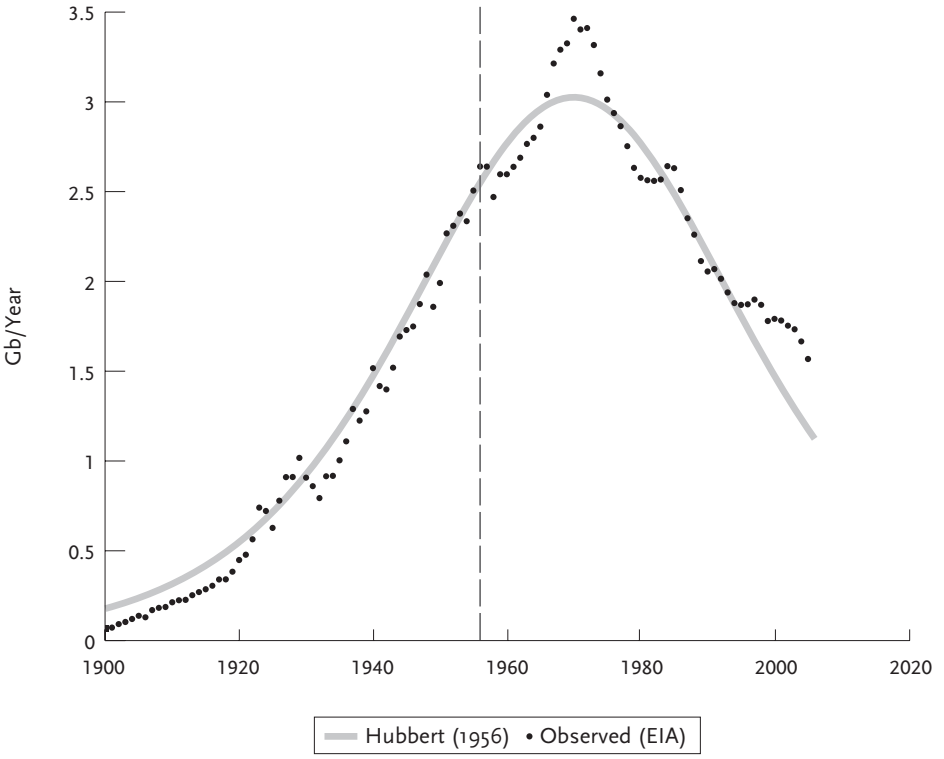
—Dr. Fatih Birol (2008), Chief Economist, International Energy Agency

A critical mass of scholarship in various disciplines has explored the potential impacts of industrial societies pushing the limits of the earth's natural capacity. A decline, whether experienced as a gradual shrinking or a rapid collapse, in the fossil fuel economy will profoundly impact Hawaiian futures. We need a sustained discussion of the implications of a waning fossil fuel economy for all aspects of our lives, and we need to start having the discussion immediately because the majority of our people have become almost completely dependent on a fossil fuel–based capitalist economy for our needs.

Oil was formed in the remote past, and as such it is a nonrenewable, finite resource subject to depletion (The Association for the Study of Peak Oil and Gas, 2008, p. 4). Every oil field reaches a peak of production and then slows until fully exploited. The term Peak Oil is an extension of American geologist M. King Hubbert's peak theory. Hubbert was a researcher for Shell Oil who theorized that the rate of production is directly related to the total amount of undeveloped oil in any particular field and in the world, following a bell curve (see Figure 1). In 1969, he predicted the peak would be reached in 2000 (Committee on Resources and Man, Division of Earth Sciences, National Academy of Sciences, 1969). Critics of

the Peak Oil theory argue that while oil is certainly a finite resource, a declining supply may be experienced more as an "undulating plateau" on a slow decline, rather than a dramatic peak (Jackson, 2007).

FIGURE 1 Comparison of Hubbert's prediction of peak and decline in U.S. oil production and U.S. actual production. U.S. Lower-48 oil production (crude oil only) and Hubbert high estimate (URR= 200Gb, K=6%, 1970), the dashed line indicates the 1956 year (prediction year).



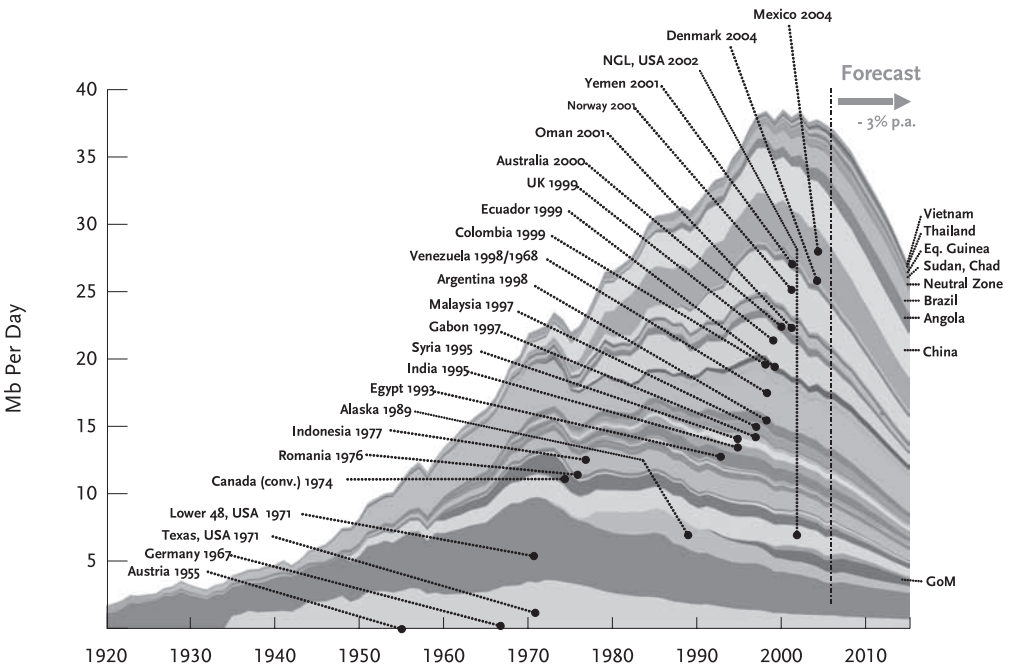
Source: Data from the U.S. Energy Information Administration. Graph prepared by S. Foucher and available at http://upload.wikimedia.org/wikipedia/commons/5/58/Hubbert_US_high.svg

Among petroleum geologists today, some believe the peak was reached during the first decade of the 21st century. In 2005 Deffeyes argued that global total oil production was just reaching the peak and that oil production would first begin

a slow decline that would then become more rapid over time. In his book *Beyond Oil: The View from Hubbert's Peak* he reports that the world's oil producers have "hit," or initially tapped, 94% of all the oil that can ever be expected to hit, and he forecasts that by 2019 production will be down to 90% of the peak level (Deffeyes, 2006, pp. 7, 49). More conservative estimates place the peak in the 2030s or 2040s. However, there is little substantial disagreement that a height will be reached at some point in the first half of this century, and there is substantial agreement that it will happen within our lifetimes or the lifetimes of our children. It is also widely agreed that we won't know exactly and positively when the peak has been reached until several years into the beginning of decline, and many indicators show strong evidence that we are in that zone:

- U.S. oil production reached and passed its peak in 1970 (Deffeyes, 2006, p. 40).
- Global per capita production peaked in 1979, at around 2 liters per person per day. At that point, the world's population began growing more quickly than oil production (Deffeyes, 2006, p. 177).
- Despite that per capita peak, as of 2004, Americans used 4 liters per person per day (Bartlett, 2004, p. 54).
- Total world oil usage began exceeding discoveries of new oil fields in 1981 (Campbell, n.d.).
- As of 1998, total world production began to flatten and as of 2003 was flat. As of 2003, there was "no significant under-utilized oil production capacity in the world," including Saudi Arabia, the country with the largest annual production and export of total petroleum, with one-fifth of the worlds proven oil reserves. (Deffeyes, 2006, p. 34). Saudi Arabia reached peak production in 2005.
- Currently, of the 65 largest oil-producing countries in the world, 54 have passed their peak (see Figure 2) and are now in decline (Grubb, 2011).[4]
- As of 2006, major oil companies were not building new refineries or increasing the size of their tanker fleets (Deffeyes, 2006, p. xiii–xiv).

FIGURE 2 Oil-producing countries past peak production



Source: Crude Oil: The Supply Outlook (No. 3/2007), by W. Zittel & J. Schindler, 2007. EWG Series. Ottobrunn, Germany: Energy Watch Group and Ludwig Bōlkow-Stiftung, p. 11.

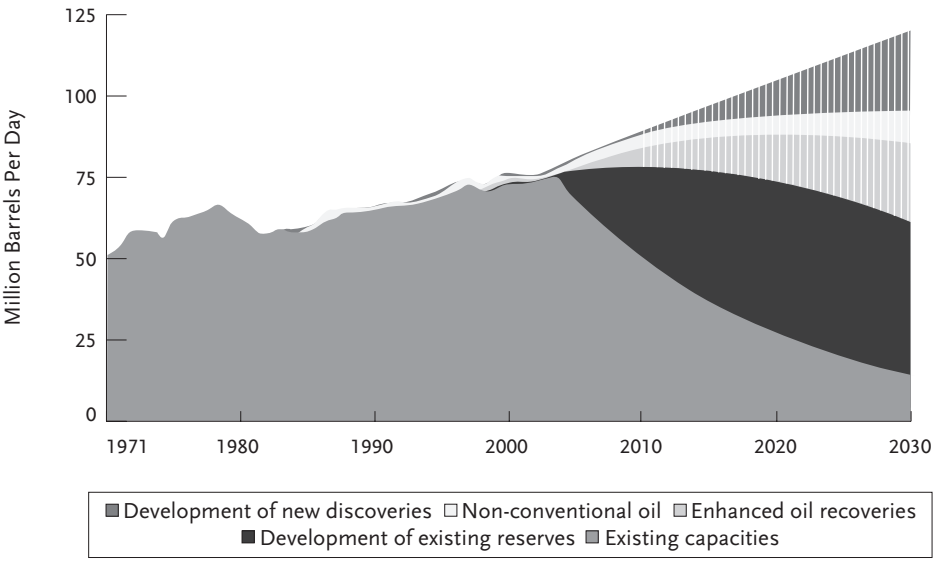
These findings and projections are not only being made by activist and scholarly proponents of the Peak Oil theory. Every 2 years, the United States Joint Forces Command issues future projections describing their "perspective on future trends, shocks, contexts and implications" that will likely impact the U.S. Joint Forces in the coming years. The report is called the *US Military Joint Operating Environment* (JOE), and the 2010 report states:

> By the 2030s, demand is estimated to be nearly 50% greater than today...Absent a major increase in the relative reliance on alternative energy sources (which would require vast insertions of capital, dramatic changes in technology, and altered political attitudes toward nuclear energy), oil and coal will continue to drive the energy train...*Assuming the most*

> *optimistic scenario for improved petroleum production through enhanced recovery means, the development of non-conventional oils and new discoveries, petroleum will be hard pressed to meet the expected future demand.* (United States Joint Forces Command, Joint Futures Group, 2010, p. 24)

In other words, the kind of economic growth to which Americans have become accustomed will be next to impossible given the current supply of petroleum and other nonrenewable fuels. Even in the most optimistic scenarios which include major new development and discovery the likes of which have not been seen in recent decades, it will be incredibly difficult for supply to meet demand (see Figure 3).

FIGURE 3 Projection of future world oil production in relation to estimated demand for energy



Source: The Joint Operating Environment 2010, by United States Joint Forces Command, Joint Futures Group, 2010. Suffolk: United States Joint Forces Command. Retrieved from www.jfcom.mil/newslink/storyarchive/2010/JOE_2010_0.pdf, p. 25.

A significant number of geologists and economists, among others, predict that as the global supply of oil declines and becomes increasingly expensive, a substantial decline in material standards of living can be expected. In 2008, Jeroen van de Veer, then CEO of Shell Oil stated, "Shell estimates that after 2015 supplies of easy-to-access oil and gas will no longer keep up with demand."[5] Richard Heinberg, in his book *Peak Everything: Waking Up to a Century of Declines* (2010), asserts that "the world is currently as reliant on hydrocarbons as it is on water, sunlight, and soil. Without oil for transportation and agriculture, without gas for heating, and without coal for power generation, the global economy would come to a sputtering halt" (p. 20). In any case, a decline in the fossil fuel economy, whether experienced as a gradual transition or a rapid collapse, will profoundly impact Hawaiian futures. Whereas those of us born in the 20th century have lived on the incline of Hubbert's peak, our children and grandchildren will likely live on the declining side.

We must also remember a declining oil supply will be compounded with the converging phenomena of global warming/burning and climate change, rising population, declining fish harvests, the loss of biodiversity, and limited land for agricultural production among other things. In 2006, a seven-volume *Millennium Ecosystem Assessment* (MA) was released, the collective effort of 1,360 experts in 95 countries to produce a global assessment of the Earth's ecosystems. They write,

> About 60 percent of the ecosystem services examined in the MA—including fisheries and fresh water—are being degraded or used in ways that cannot be sustained. In many cases, we are literally living on borrowed time. By using up supplies of fresh groundwater faster than they can be recharged, for example, we are depleting assets at the expense of our children. (Millenium Ecosystem Assessment, 2007, p. 5)

Even if one does not believe that Peak Oil is a reality we will see anytime soon, it is impossible to deny the ecological destruction that fossil fuel–based, transnational corporate capitalist economies have hastened. For Kānaka Maoli, these levels of exploitation and consumption should be seen as profoundly out of sync with our kūpuna values.

Why Do We Need to Think About the Shift From a Fossil Fuel–Based Economy as a Hawaiian Issue?

What does this mean for Hawai'i, and more specifically, for the well-being of Kānaka Maoli? In the past 40 years, since U.S. oil production peaked, Hawai'i has remained almost completely dependent on oil as our primary source of energy—85% of our energy usage comes from oil, and another 5% from coal, the second largest source of energy (Coffman, 2010; Curtis, 2010). And let us not forget that crude oil and coal get to our islands on ships that are also fueled by petroleum. As a result, Hawai'i residents pay higher energy prices, with the average retail price per kilowatt hour about twice that of the U.S. continental average as of 2009 (De Stercke, Seligman, Teng, Zhao, & Cooke, 2011; see also the U.S. Energy Information Administration's website at http://www. Eia.gov/electricity/monthly/). Yet despite the price difference we also have a much higher oil consumption rate, measured in barrels of crude consumed per capita.

As 21st-century Kānaka, we too have become dependent on imported, nonrenewable sources of energy for most of our needs. Most of the water we drink requires energy to pump it out of the ground. Our homes are built with imported materials that require energy for their harvest, manufacture, and/or transport. Our vehicles are not only powered by petroleum, but the processes by which they are made require vast amounts of energy. Day-to-day items like toothpaste, coffee, towels, books, toilet paper, movies, and phones to name but a few, rely upon fossil fuels for their production.

If we consider that electricity, like rent, is a relatively fixed monthly cost for families, then we know that families with lower incomes are putting a larger proportion of their monthly earnings toward energy costs. A 2011 report on energy efficiency in low-income communities in Hawai'i found that while moderate-income families spend about 5% of their income on energy costs, low-income families put about 15% of their earnings toward energy costs (De Stercke, Seligman, Teng, Zhao, & Cooke, 2011). This leaves less disposable income for an 'ohana (family) to use for education or health care. According to the findings in *Ka Huaka'i: 2005 Native Hawaiian Educational Assessment*, Native Hawaiian families in Hawai'i have the lowest mean family income of all major ethnic groups, 15.9% lower than the Hawai'i-wide average (Kana'iaupuni, Malone, & Ishibashi, 2005). Those 2005 data further show that our per capita income is 35% lower than the Hawai'i-wide figure. We also know that energy costs on islands other than O'ahu are generally higher,

while incomes are generally lower. Thus, Kānaka Maoli living on Hawai'i, Maui, Moloka'i, Lāna'i, and Kaua'i are carrying a heavier burden in terms of energy costs vis-à-vis income.

Native Hawaiians' economic status, having the lowest income levels and rates of home-ownership in the islands, makes it more difficult (when even possible at all) to purchase and install energy- and cost-saving measures. An upper-middle-class homeowner might be able to finance a $25,000 photovoltaic system to make the home a "net zero" energy producer-consumer and minimize their monthly electricity bill, but a working class family renting their home will not have such options. Thus it becomes more important for us as a people to think about *collective solutions* and *community-based solutions*, rather than leaving the burden on individual households to come up with energy- and cost-saving measures.

The State of Hawai'i has already begun to think about our islands' overdependence on imported oil and coal and their impact on climate change. In 2007, the Hawai'i State Legislature was among the first in the United States to pass a law aimed at mitigating contribution to global climate change. *The Global Warming Solutions Act of 2007*, Act 234, brings Hawai'i in sync with the Kyoto Protocol, mandating that statewide greenhouse gas emissions be reduced to 1990 levels by 2020.[6] The following year, the state solidified an agreement with the three major energy companies in the islands—Hawaiian Electric Company (HECO), Maui Electric Company (MECO), and Hawaii Electric and Light Company (HELCO)—known as the Hawai'i Clean Energy Initiative.[7] The agreement states, "*All parties believe that the future of Hawaii requires that we move decisively and irreversibly away from imported fossil fuel for electricity and transportation and towards locally produced renewable energy and an ethic of energy efficiency*." In 2009, the Hawai'i State Legislature took further steps toward this goal by passing several bills aimed to hasten the transition to renewable energy sources. Among the key aspects of the agreement that were codified into law are two significant and ambitious requirements. By 2030, 40% of net electricity sales by electric utility companies shall be from renewable energy sources and a 30% reduction in energy use will result from increased energy efficiency measures (Codiga, 2009).[8] In total, the state targets would shift the proportion of Hawai'i energy sources from 95% fossil fuels to 70% "clean energy" within the next 18 years. The question is: how will these targets be met and how will plans to meet them interface with issues of Kanaka Maoli health and well-being?

The state government, in conjunction with the private electricity companies, is looking to address the crisis of Hawai'i's overdependence on fossil fuels through the lens of assuring benefits to a "general public." This approach, however, does not take into account the inequity in existing cost burdens between urban and rural communities, between lower-income and higher-income households, and the ways both of those distinctions (urban/rural and "have's"/"have not's") play out along ethnic lines. The large proposed projects, one of which we discuss below, would place even more burden on rural communities and their natural and subsistence economies. Moreover, the large electric companies now have a vested interest in building large-scale renewable energy plants so that they can be compliant with the law by 2030.

The shift to renewable energies is not inherently pono or innocent of power. As Hawai'i begins to shift from fossil fuels to green energy, will the shift be community- or corporate-driven? How will benefits and resources be distributed? Will the natural, subsistence, and market economies come into better balance? For Kānaka 'Ōiwi, we should consider how the pono (that which is necessary for survival) of our lāhui's future generations is provided. It is with these questions and context in mind that we turn to a case study of community development on Moloka'i, an island that has been able to maintain more of a balance between natural, sustenance, and market economies. The next section draws on Tuti Baker's research on the specific struggles over Lā'au Point and Big Wind and takes up some of the tensions and frictions that arise when communities confront these questions.[9]

Community, Transnational Corporations, and the State: A Case Study on Moloka'i

Moloka'i uses Kanaka Maoli values to create a sustainable economy that has the strength to survive the inevitable shift away from a fossil fuel–based economy. We look to Moloka'i because it is a diverse community with a strong ethos of community engagement and shared values.[10] Moloka'i-born Walter Ritte observes that most Kānaka Maoli on Moloka'i actively participate in two economies—the cash economy and the subsistence economy.[11] At the same time that residents participate in the market economy by exchanging their labor for cash, they also

participate in a sustenance economy that on Moloka'i encompasses a variety of subsistence economic practices such as hunting, fishing, and home-based agriculture. Transnational corporations employ the most people on the island and so are the major engines of the cash economy. The engines of the subsistence economy are the people in the community who take from the natural world only as much resources as needed for sustenance.

In this hybrid economy there is friction between the people who participate in both the cash and subsistence economies to provide for their sustenance, and transnational corporations driven by profit-taking and the accumulation of capital within a market-based economy. In Anna Tsing's book *Friction: An Ethnography of Global Connection* the term friction refers to the imperfect connectivity between people from different cultures and socioeconomic strata and between events at global versus local scales. Friction, Tsing (2004) contends, is the creative force that gives meaning to economic and cultural interactions, while also "refusing the lie that global power operates as a well-oiled machine" (p. 6). The following two examples illustrate how political struggle and the friction that it creates on the ground in the local community arena generates unexpected actions and reactions in the arena of transnational corporations and state institutions. Our first example is the political struggle that arose when the community-based economic development organization Moloka'i Enterprise Community attempted to collaborate with the island's largest landowner, Guoco Group Limited.

Lā'au Point

On Moloka'i community-based planning is deeply connected to Kanaka Maoli values as expressed in a statement in the pamphlet put out by Ka Honua Momona.[12]

> The values of aloha 'āina and mālama 'āina (love and care for the land) guide our stewardship of Moloka'i's natural resources, which nourish our families both physically and spiritually....We honor our island's Hawaiian cultural heritage, no matter what our ethnicity, and that culture is practiced in our everyday lives. *Our true wealth is measured by the extent of our generosity.* (McGregor, 2007, pp. 193–194, emphasis added)

This community vision statement calls for economic development strategies that are grounded in indigenous Kanaka Maoli values. These values of aloha ʻāina and mālama ʻāina are aligned with Shiva's framework for thinking about three economies, as described above. In the Molokaʻi statement, the community affirms its collective and material relationship to the human and natural environment and its responsibilities to be stewards of the land and its resources.[13] The statement expresses a commitment to balancing the natural, sustenance, and market economies through economic development embedded within social structures that value human relations over capital gain, encapsulated in the phrase "wealth is measured by the extent of one's generosity." When a community takes on the responsibility to care for the land and its natural resources the priorities for economic development focus on providing for the sustenance of the community (food, water, shelter) and allowing the productive capacity of the natural economy to function and provide resources in the present and into the future. The market economy must operate symbiotically with the sustenance economy and the natural economy.

Guoco Group Limited operates within the neoliberal market capitalism model. As stated in the corporation's 2009 annual report, Guoco Group Limited engages in economic activity that works to maximize corporate profits (Guoco Group Limited, 2009, p. 3). The corporation sees its land holdings as commodities whose value is measured in the marketplace in terms of potential capital gain. Within this economic model attention to social and environmental welfare is limited by the corporation's mandate to accumulate capital and make a profit for shareholders.

In 1998 Kānaka Maoli initiated a community development project to find solutions to the lack of opportunities within the cash economy on Molokaʻi. This planning process included a coalition of diverse residents who were committed to Kanaka Maoli concepts of sustainability, including aloha ʻāina and mālama ʻāina. The group applied for and received Enterprise Community status from the United States Department of Agriculture.[14] This qualified the community for federal money for community-based economic development. The Molokaʻi Enterprise Community (MEC) was the democratically structured institution formed to administer the funds. In the first 5 years of operation, the MEC Board of Directors outlined a wide range of economic development projects including building a community-run commercial kitchen, assisting farmers with equipment purchases, establishing a charter school, and commissioning a community-based visitor plan for Molokaʻi.[15]

In 2003 the MEC agreed to work with Molokaʻi Properties Limited, a subsidiary of Guoco Group Limited, to create a Community-Based Master Land Use Plan for Molokaʻi Ranch ("the Plan"). This Plan incorporated many priorities that were in keeping with the community's vision statement. The Plan called for giving 26,200 acres, approximately one-third of the land holdings of Molokaʻi Properties Limited, to the Molokaʻi Land Trust; establishing easements over another 24,000 acres of Molokaʻi Ranch holdings to preserve agricultural and rural land use designations; and reopening the Kaluakoʻi resort and golf course to provide employment for Molokaʻi residents. In exchange for these concessions Molokaʻi Properties Limited expected community support for the development of 200 luxury homes at Lāʻau Point on Molokaʻi's southwest shoreline.

A large segment of the Molokaʻi community did not support the Lāʻau Point development. Fishermen were concerned that developing Lāʻau Point would adversely impact the fertile offshore fishing area that provides sustenance for island residents. Farmers insisted that there was not enough water on the island to support the development. And many residents from across the island were concerned that the development of luxury housing at such a large scale would unbalance the social and economic power relations on the island and negatively impact Molokaʻi's lifestyle. The Plan eventually fell through because of opposition to luxury housing and the forces of change that were assumed to follow an influx of high-income residents on Molokaʻi. The community reached consensus on a number of the Plan's elements such as reopening the Kaluakoʻi Resort to provide jobs for residents and protecting lands from real estate speculators. But a large portion of the community could not accept these gains at the expense of losing Lāʻau Point to luxury housing (Baker, 2011).

By participating in this community planning process, Guoco Group Limited rhetorically positioned itself as an ally of the Molokaʻi community, while simultaneously making economic decisions to protect its own assets and investments. The employees of Molokaʻi Properties Limited who participated in developing the Plan with the Molokaʻi community probably negotiated the details of the Plan in good faith, believing that the promises made would be realized. But, moving up the corporate hierarchy and further away from Molokaʻi, those making economic decisions at corporate headquarters prioritized a different set of accountabilities. Friction heated up between the corporation and those on the island who opposed the development at Lāʻau Point, and the development was eventually put on hold.

Four months after the corporation withdrew its petition before the Hawai'i Land Use Commission to amend land use boundaries that would allow the corporation to develop Lā'au Point, Moloka'i Properties Limited closed all its operations on the island. One hundred and twenty full-time employees lost their jobs, and access to Moloka'i Properties Limited's land was closed indefinitely. In a press release the company CEO wrote, "The decision is purely a business one" (Guoco Group Limited, 2008). In other words, the corporation has a mandate to maximize profits, and as a business its social obligation to the people living on Moloka'i is very limited.

The Lā'au Point controversy demonstrates the friction that exists between traditional Kanaka Maoli values and the neoliberal values of transnational capitalism. *Development*, as framed by the Moloka'i community, focused on: (1) providing income for residents so they can participate in the cash economy, including developing a visitor industry built around human interaction between visitor as guest and resident as host; (2) providing for community well-being with projects such as building affordable housing for residents, improving sustainable agricultural production; and (3) protecting the environment to ensure a healthy natural economy and a healthy subsistence economy to ensure reliable local food sources and to preserve natural resources and cultural sites. In contrast, Guoco Group Limited prioritized using its assets to generate profit for shareholders in a market-based economic framework. In the Lā'au Point case, friction arose when the moral obligation of the community to be stewards of the land and its resources collided with the transnational corporation's obligation to accumulate capital, in this case by developing luxury homes. In this instance the friction revealed that while this project would yield profits for the company, there were also hidden costs to the community and environment.

Guoco Group Limited expected that engaging with the Moloka'i community would result in the community agreeing to their development plans "for their own good." Instead this engagement initiated an ongoing dialogue within the community about appropriate development for Moloka'i. This ongoing debate about economic development flared again around "Big Wind," a proposed large-scale wind farm that would generate electricity on Moloka'i and Lāna'i and transport it to O'ahu. The case of Big Wind underscores our point that any shift away from oil and toward renewable energies will be laden with issues of power.

Big Wind

In July 2011 Lieutenant Governor Brian Schatz visited Molokaʻi and spoke with the *Molokai Dispatch* about economic development on the island. In the interview, Schatz responded to a question about Big Wind:

> What we agree about is we ought to move off of oil because we're in an extremely vulnerable position. I think we also agree that as we move forward with clean energy projects, that wherever those projects are located, that the communities in those areas ought to share in the benefit. (*Molokai Dispatch* Staff, 2011)

Later in the interview he stated that urban Oʻahu—the military, economic, and political center of the state—does not have the land area to support large-scale renewable energy projects. He argued that, in the spirit of cooperation and with sufficient compensation, rural communities should agree to have these industrial-scale projects built in order to provide energy to Oʻahu. The lieutenant governor's remarks were directed to those on Molokaʻi who do not support the prospect of an industrial-scale wind farm on Molokaʻi.

In 2011, Molokaʻi Renewables, a group formed by San Francisco–based alternative energy developer Pattern Energy and Honolulu-based developer Bio-Logical Capital, leased 11,000 acres from Molokaʻi Properties, the same company that 3 years earlier had shut down operations because it could not develop at Lāʻau Point. The newly created energy corporation was prepared to build the wind farm as a part of the Hawaiʻi Clean Energy Initiative (HCEI). As discussed in the previous section, HCEI mandated that the Hawaiian Electric Company, Oʻahu's electric utility, expand its renewable energy portfolio by at least 1,100 megawatts by 2030. A wind farm on Molokaʻi could potentially generate 200 megawatts of that energy portfolio (Cassidy, 2011a; Lo, 2010a, 2010b).

HECO has worked on brokering a benefits package for Molokaʻi residents in exchange for building the industrial wind farm and transmission substation on the island. At the time of writing, benefits that have been mentioned include $1.5 to $2 million annual contributions from Molokaʻi Renewables for approved community projects as well as possible rate reductions for Molokaʻi residents.

HECO has also pledged to resolve issues on the Moloka'i grid so more residents can install small-scale solar and wind generators. Residents are responding with questions about the impacts an industrial wind farm would have on the social and natural environment and whether industrial-scale wind energy is the most efficient way to lower dependence on fossil fuels and meet Hawai'i's energy needs (Cassidy, 2011b, 2011c; Cluett, 2011; *Molokai News* Staff, 2011).

The State and HECO continue to pursue a centralized, industrial-scale electricity production and transmission infrastructure. Large-scale production means a large input of capital, which will most likely come from a corporation whose first priority is to produce profit from the capital it invests. A project like Big Wind will be built in the private sector only if the owner can profit. Moloka'i Renewables believes that it can make a profit from Big Wind even with the millions of dollars of benefits that it promises to provide to the Moloka'i community at a future date. Just as Guoco Group Limited decided in the Lā'au case, though, the operator of a wind farm could shut down operation if it does not yield a profit.

As 2030 approaches and the need to meet the law's renewable energy targets intensifies, the state's economic imperatives (as defined within a market-based framework) will increasingly challenge Moloka'i and other rural communities who assert the demand that activities within the cash-based market be balanced with the social and ecological health of those communities. It is more than likely that the discourse of "public benefit" will continue to rub against the 'Ōiwi values of aloha/mālama 'āina and kuleana that have driven natural resource use decisions in our islands for countless generations. These two examples from Moloka'i raise some significant questions as we face an inevitable great shift away from the fossil fuel–based economy: Who benefits most from proposed projects? What are the costs to social cohesion and natural resources on various islands? Who should own the energy generated by the winds and other natural resources that have not been previously commodified within a market economy? Should they be owned at all, or be recognized as a public trust in the same way we think about and use water in Hawai'i? These are questions that all communities must ask if we are to move beyond the fossil fuel economy in a responsible and pono manner.

E Hoʻomau ke Kūkākūkā ʻAna (Let the Discussions Continue)

We began this article with a call to our lāhui Kānaka ʻŌiwi to attend to the environmental conditions of our time and prepare for our collective futures, focusing on the potential challenges Peak Oil poses for the health and well-being of our people. We raised some of the complexities with which our lāhui must grapple as we consider ways to improve our collective well-being in the age of oil decline. Rather than presenting a finished position we hope this article opens and catalyzes further discussion, for we believe crisis creates opportunity. Thus we end with a series of questions rather than conclusions.

The story of the Molokaʻi community's struggle over development of the Kaluakoʻi moku (district of eastern Molokaʻi, including Lāʻau) raises the question of kuleana, an ancestral economic and political ethic. The dominant discourse utilized by the State of Hawaiʻi centers the "larger good" of the "general public," and in this language all state citizens are lumped together. Yet our kūpuna have historically approached resource management in a different way, according to kuleana based on one's relationship to particular ʻāina. Beniamina writes that knowing what is not one's kuleana is the equally important, corresponding side of being clear about what *is* one's kuleana.

> Sometimes one needs to know when to step back. If it is not your ahupuaʻa (land division usually extending from the uplands to the sea), not your ʻili (subdivision of an ahupuaʻa), not your moku (district), it is not even your mokupuni (island), don't maha ʻoi. You need to respect the kuleana enough to leave it be. (Beniamina, 2010, p. 21)

Like Beniamina, other Hawaiian scholars have emphasized that kuleana differs with respect to one's position in relation to a community or place.[16] This is a fundamentally different orientation from one based on state-based conceptions of "the public."

How should these understandings of kuleana interface with the circumstances of our time, in which alternative and renewable energy sources must be identified? Who should make decisions about the capture of renewable forces of energy,

such as wind, wave, and geothermal power? Both authors of this article recognize that we speak as O'ahu-dwellers, among the segment of our people who live on an island that consumes the vast majority of imported oil yet pays the lowest prices relative to our 'ohana on other islands. Knowing that the existing power plants that supply most of O'ahu's energy are already located within or adjacent to predominantly Kanaka Maoli communities on O'ahu, what does it mean to place the burden on islands like Moloka'i and Lāna'i to generate alternative energy? Who should have the kuleana to decide the ways lands on those islands are used?

Aside from the State of Hawai'i's or a single community's position, these are questions we should confront together as a lāhui. Other 'Ōiwi scholars are beginning to consider various aspects of these issues. Guy Kaulukukui has proposed making all Department of Hawaiian Homelands housing developments energy self-sufficient, primarily through neighborhood-level solar energy projects.[17] If such energy projects captured more energy than used within that homestead community, energy could be sold to the electric utilities to generate revenue for DHHL or the community itself. Similarly, Lehua Ka'uhane has made renewable energy policy recommendations that include shifting the state's focus from large-scale industrial energy "farms" to locally controlled small-scale renewable energy projects.[18] Such proposals make sense when we look at countries such as Denmark that are leading the way in energy efficiency and independence.[19]

Economic independence in Hawai'i requires that we reckon our interdependencies between islands and ahupua'a in a pono manner. Cheaply produced oil has been the lifeblood of an increasingly globalized and corporatized capitalist economic system, and the age of imperialism has caused great inequality, both in our home and around the world. A great shift allows us the opportunity to confront and remedy those inequalities, lest we watch the gap between the haves and have-nots continue to widen in a post-oil Hawai'i.

Whether or not alternative sources of energy are identified, we should ask ourselves: what is the role we want a globalized market economy to play in our potential futures? In other words, what should be the role of capitalism in the long-term health and well-being of the lāhui Hawai'i? Will a global, corporate capitalist economic system allow us to live sustainable lives for generations to come? As Hawaiian scholar and kanaka aloha 'āina Kekuni Blaisdell points out in the film *Taking Waikīkī*: "The capitalist economic system is based on profit.

What does profit mean? One takes more than one gives. That's what profit is" (Coll & Bain, 1994). He concisely encapsulates a fundamental contradiction in values between capitalist imperatives and Hawaiian culture. In the face of these conflicting values, and the ways neoliberal capitalism contributes to the degradation of our earth's ecosystems and the ongoing economic malaise of various segments of our Hawaiian community, what other means of providing for our needs and desires can we imagine and develop? How can we create a great shift toward a more pono economy that balances the interconnected natural, sustenance, and market economies?

We might look to successful Hawaiian community-based enterprises like MAʻO Organic Farms, which is a thriving business that contributes to the social welfare of the Waiʻanae community at the same time that it successfully participates in the market economy.[20] An economic and cultural shift can and must mean rebuilding local communities' capacities to provide for more of our own basic needs. A shift would allow us to come together to restore community-based forms of deliberation and decision-making that have contributed to the longevity of our lāhui, as we consider together how to create resilience and wean ourselves from overdependence on the fossil fuel economy.

A great shift would allow us to turn with focus and determination to the wisdom of our kūpuna. Traditional Hawaiian lifestyles center the natural and sustenance economies. In the video *Molokaʻi Return to Pono*, Molokaʻi-based filmmaker Matt Yamashita invokes the island's historical moniker, "ka ʻāina momona" (a fertile land), and its more recent history of resistance to "paving over the island" as the inspiration that drives Molokaʻi's community-based planning processes. The aim is "to secure a hopeful future of sustainability and health" (Yamashita, 2008). In the video he cites as evidence of the beginnings of a "return to pono" the ongoing efforts on the island to restore loʻi and loko iʻa, to teach Hawaiian language and cultural values in the schools, and to reclaim lands from foreign ownership. In the face of Peak Oil, it is important to remember that our kūpuna technologies such as loko iʻa and loʻi kalo maximize solar energy rather than fossil fuel energy for prolific food production. Numerous initiatives already exist within our communities to revitalize these life-giving structures and to add our own 21st-century innovations. Though we have not yet achieved the scale at which we can significantly diminish the dependence of large numbers of our people on the fossil fuel economy, we should continue to expand existing community-based projects restoring and utilizing our kūpuna technologies of farming fish and vegetable foods.

The large Hawaiian institutions that control significant bodies of landed, intellectual, social, and financial resources—such as the Office of Hawaiian Affairs, the Kamehameha Schools, the university-level Hawaiian Studies schools or departments, and the Association of Hawaiian Civic Clubs—can contribute to the long-term well-being of our lāhui by helping facilitate further research, discussion, and action around the issues we have raised here. Such organizations have a kuleana to ensure that Kānaka of rural communities, non-homeowners, homesteaders, and other grassroots-level organizations have a place at the table to discuss lāhui-wide strategies, agendas, and frameworks for surviving and thriving in the time of this great shift. Up to this point, those segments of our community have largely been left out of the state's planning processes, such as the HCEI or the Hawai'i 2050 Sustainability Plan.[21]

Just as the deeds of our ancestors are always a part of us, residing within and around us, so too do we inhabit the futures of our descendants. Our actions and inactions today will profoundly shape their lives, whether or not we are conscious of it. The opening 'ōlelo no'eau provides instructions from generations before us: we need to pay attention to signs and trends within our environment, and we need to be prepared for what may come. Our kūpuna tell us that it is better to be mākaukau (prepared) than to be standing with our backs to the ocean when a big wave breaks. I ka moana nō ka i'a, liuliu 'ia nā pono lawai'a. What potential futures might we create for present and future generations? Let us envision and prepare together.

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Notes

1 Waziyatawin's essay is currently unpublished and available through the author. She is, however, currently writing a book-length work on this topic, which should be available within the next year or two. Those interested in learning more about her body of work can go to her website: http://waziyatawin.net/commentary/ (accessed January 29, 2012).

2 This article grew out of discussions generated by a panel at the 2010 Research Conference on Native Hawaiian Well-Being. The panel included the authors of this article along with Guy Kaulukukui, who called us to think about moving toward a more "pono economy."

3 One of the central insights of the intellectual field known as futures studies is that all representations of the future are political. Futures studies scholars remind us that there is no singular future; rather they call on us to consider the multiple possible futures that are opened or foreclosed by our actions in the present.

4 For a list of countries past their peak production, *based on the BP Statistical Review of World Energy*, see http://www.theoildrum.com/node/5576 (accessed August 10, 2011).

5 Shortly after van de Veer's January 22, 2008, email to all Shell employees, it went viral and can be found on numerous websites, including http://www.bravenewleaf.com/environment/2008/01/peak-oil-skepti.html (accessed August 10, 2011). Since that time, Shell has launched a full campaign around the two scenarios van de Veer proposed, describing two potential paths in the face of declining oil: "scramble" and "blueprints." See http://www.shell.com/home/content/aboutshell/our_strategy/shell_global_scenarios/ (accessed August 10, 2011).

6 Adopted in 1997 and entering into force in 2005, the Kyoto Protocol is an international agreement that among other things commits 37 industrialized countries and the European Union to binding targets for reducing greenhouse gas (GHG) emissions. Although 191 countries and the European Union have signed on to and ratified the Kyoto agreement, the U.S. federal government has not yet ratified its support for and commitment to it. Thus, it is significant that the State of Hawai'i voluntarily took on the mandates of the Kyoto Protocol GHG reduction targets by passing Act 234.

7 For information on the Hawaii Clean Energy Initiative, see http://www.hawaiicleanenergyinitiative.org/.

8 Mahalo nui to Lehua Ka'uhane for connecting us with Douglas Codiga's writings on Hawai'i state law related to climate change and renewable energy, as well as for invaluable conversations that have advanced our thinking on these issues.

9 Portions of Baker's research on Moloka'i community-based development have been published previously in the *International Journal of Critical Indigenous Studies* (Baker, 2011).

10 The community is not monolithic, and it is beyond the scope of this article to examine the complex social dynamics and economic practices on the island.

11 Mahalo nui to Walter Ritte for this articulation of Moloka'i's economies, which he offered at the Moana Nui Conference on November 11, 2011, and at the Monsanto in Hawai'i Panel Discussion on Wednesday, January 18, 2012. Both presentations were at the Kamakakūokalani Center for Hawaiian Studies.

12 Ka Honua Momona is a nonprofit corporation based on the island of Moloka'i whose mission is to be a model of sustainability *ma uka a ma kai* (from the mountains to the sea). More information on the organization can be found at http://www.kahonuamomona.org (accessed January 28, 2012).

13 In 2008, Moloka'i community members created an expanded vision statement titled "Molokai: Future of a Hawaiian Island" (2008).

14 An Enterprise Community was a special program created to stimulate economic development in rural areas. For more information see http://www.rurdev.usda.gov/BCP-EZEC-Principles.html (accessed January 28, 2012).

15 Activities of the MEC can be found at the following website: http://www.rurdev.usda.gov/rbs/ezec/Community_BMS_2004/Molokaibms.html (accessed January 26, 2012).

16 Samuel Kamakau stresses that the relationship between familial lineage and kuleana is so central to our kūpuna worldview that it shapes not only our kuleana in this life but also in the afterlife. For example, he writes that one's spirit would only reside in those places or become transformed into the bodily forms of things (animals, plants, thunder, etc.) from which they were lineally descended. For example, he writes, "The persons who have a kuleana in Ka Lua o Pele are the direct descendants (pulapula pono'i) of Haumea, Kanehekili, Kaho'ali'i, Kanewawahilani, Kailanuimakehaikalani, Nakoloilani, Kanohoali'i, Pele, Hi'iaka, and Namakaokaha'i...Only through the blood lineage (koko i eweewe mai) of the ancestors does the *kuleana* come" (Kamakau, 1991, p. 66).

17 Guy Kaulukukui presented an unpublished paper on this topic at the 2010 Research Conference on Native Hawaiian Well-Being. Interested readers should contact Dr. Kaulukukui directly for more information on his proposal.

18 Lehua Ka'uhane's thesis in progress is titled "Incorporating Indigenous Concerns in Hawai'i's Renewable Energy Policy." She is completing a master's degree through the University of Hawai'i at Mānoa's Deparment of Urban Planning, and she has also written on this topic as a student at the Richardson School of Law. Contact her directly for the most up-to-date version of her writings and thinking on this topic.

19 Denmark is a world leader in energy efficiency and has set a goal of becoming completely independent from fossil fuels by 2050 ("Could Denmark Be Fossil Fuel Free by 2050?" 2010). Like Hawai'i, Denmark was 95% dependent on fossil fuels but since the 1970s has taken consistent and bold steps to reduce consumption, heighten efficiency, tax fossil fuel usage, and build offshore wind turbines. The country is now a net *exporter* of energy (Ostervang, 2011). Denmark is also the world leader in decentralized, or distributed generation, energy. Decentralized energy refers to energy that is produced nearer to the point at which it is being used. See the World Alliance for Decentralized Energy for more information (http://www.localpower.org/ (accessed January 30, 2012).

20 For more information about MA'O Organic Farms, see http://maoorganicfarms.org/ (accessed January 28, 2012).

21 Passed in 2005, Act 8 established the Hawai'i 2050 Sustainability Task Force. The twenty-five member Task Force has a mix of public and private sector representatives, including representatives appointed by or representing the Governor, Speaker of the House, Senate President, the Mayors of the counties of Hawai'i, Kaua'i, Maui, and Honolulu, the director of the Office of Planning, the University of Hawai'i Department of Urban & Regional Planning, and the State Auditor. The Hawai'i Sustainability Plan 2050 can be downloaded at http://www.hawaii2050.org/ (accessed January 29, 2012).