

HAWAII'S 100% RENEWABLE GOAL: THE CONFLUENCE OF POLICY AND REALITY

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Abstract

Hawaii has traditionally relied almost entirely on petroleum for its power needs. In the years between 2004 and 2010 the State of Hawai'i made a substantial commitment to getting off oil and moving to renewable energy.

Between 2011 and 2015, the progress on renewable energy suffered a series of setbacks. The reasons for this are explored as well as what could be done to move the State aggressively forward again.

Introduction

Hawaii has long nurtured the dream of being energy independent using local energy, which by definition means renewable energy, as Hawaii has no oil or gas deposits and no uranium or other nuclear resources.

In large part this has been driven by the reality that Hawaii has historically been 100% dependent on imported product, and we have therefore been 100% subject to market forces. That in turn means that during spikes in commodity prices there is a very negative impact on Hawaii's economy and well-being. It is also in part a strong sense that we want to be self-reliant; to support ourselves and be self-sustaining.

There are a few key aspects of Hawaii's energy picture that are important to understand and that have not always been accounted for in Hawaii's programs to deal with this situation.

First, the ways energy is used in Hawaii are unique in the United States; one-third for electricity, one third for ground transportation (primarily automobiles), and one third for jet fuel to support our tourist industry. Almost every program initiated in Hawaii's history has primarily dealt with the electricity sector, and none have deal at all with the jet fuel issue.

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Second, the system that evolved in Hawaii was highly symbiotic. An imported barrel of oil was used to supply all of Hawaii's energy needs. The barrel yielded jet fuel and diesel, the gas used by the local retail gas company, gasoline, marine fuels, and then the bottom of the barrel, bunker type oil that was sent to the utility power plants to burn off. Beyond that barrel, some already processed jet fuel was imported and some naphtha was exported. It was a system that worked well when oil was inexpensive and largely American (i.e., Alaskan) in origin. One major challenge with this arrangement is that there is no hedge on the imported product. If oil prices rise, every part of life in Hawaii is immediately impacted.

Third, while unit prices for the commodities that are oil based were always higher than the corresponding products on the mainland (a function of both transportation costs and the lack of economies of scale), the low use patterns meant that the impact of oil on the pocketbooks of Hawaii was relatively low. Put another way, while our gasoline prices have normally been the highest in the nation, our driving distances are relatively short so the monthly bill for gasoline for the average person in Hawaii was less than their mainland U.S. peers.

In the case of electricity, a temperate climate, air conditioning being a luxury and not a necessity, and no home heating in the winter meant that while the kilowatt per hour (kWh) cost of electricity may have been the highest in the nation, the electricity bills were in the lower half of the nation. As a "share of wallet" energy in Hawaii has traditionally been in the bottom fifteen states in terms of how much goes to energy. This last point, more than any other, probably accounts for the fact that the price of energy has not been a significant political hot button in Hawaii throughout most of its history.

The fact that commodity prices have not driven the debate has not however meant that there has not been a debate about oil over the years. What it has meant is that the debate has not been driven by economics. What have driven it are environmental values, especially at the leadership levels, and economic security issues.

Both in Hawaii, and nationally in the U.S., oil embargoes, price spikes during periods of conflict in the Middle East, and a general concern about the power that OPEC has had over our economy, have driven periods of national and local focus on renewable energy. Often accompanied nationally by flurries of federal spending on alternatives to oil, and broad stroke political calls for the U.S. to "wean itself off of imported oil by X date," the debate on oil has

been part of the political fabric of the nation and Hawaii since the 1970s. It has however not been sustained. On each occasion, after some period of investment and of rhetoric, prices fall, the international situation stabilizes, and the urgency goes out of the drive for renewable energy.

The situation in Hawaii has however been a little different. The drive to renewable energy has had an ongoing strength that is has not had nationally. Again though, this is not because of economics. It has had strength in Hawaii because at a leadership level, particularly in the State Legislature, environmental values have been more at the core of mainstream leadership views than in most other states. One of the most tangible pieces of evidence for this are the ongoing financial incentives provided for Hawaii residents to install solar water heating, long after such programs had ceased everywhere else in the nation. By the early 2000s, one-fifth of all homes in Hawaii had a solar water heater on their roofs.

In spite of that leadership focus however, Hawaii's dependence on oil remained extremely high with renewable energy numbers in the single digits overall in electricity, and non-existent in transportation and aviation fuel.

The Hawaii Renewable Revolution 2004 to 2010

Beginning in 2004, led by a combination of Republican Governor Linda Lingle and State House Energy Committee Chair Hermina (Mina) Morita, the environment changed dramatically. The drive to significantly increase the level of renewable energy, and in particular to alter the activities of Hawaii's monopoly electrical utility, Hawaiian Electric Company with its 93% market share, took on a new and powerful urgency. The Governor in particular was unrelenting in her demand that the company change its behavior and attitude or face severe consequences.² Most impactful for the company was the threat to eliminate or at least

² One interesting note about Governor Lingle's philosophy was that it appeared at its core to be based on energy security more than on renewable energy. The Governor wanted Hawaii freed of energy brought into Hawaii. That Hawaii-based energy is all renewable was great but the key was to not import energy. She was a strong opponent of natural gas as a result of both goals.

limit its fuel cost adjustment clause, thereby subjecting the company to immense levels of fuel price risk. The mere threat of such a change made financial analysts very concerned about the company's future.

In 2004, the renewable portfolio standard for the state, the level of renewable energy that the electric utility is required to generate, was raised from 10% to 20%. In 2006, the Governor introduced a set of four bills that represented the broadest attack yet on the operations of the utility. Key provisions included removing the energy efficiency programs from the utility and placing them in an independent body under the jurisdiction of the Public Utilities Commission (PUC) and reducing the coverage of the energy cost adjustment clause. While the latter was defeated, the former passed along with a number of other measures that demonstrated a strong political commitment to renewable energy by both the Legislature and the State Administration.

In 2007 the U.S. Department of Energy (DOE) and the State of Hawai'i began to discuss a partnership that would bring federal expertise and resources to Hawaii. While the Bush Administration was not seen to be pro-renewable energy in general, Hawaii represented an opportunity to be a test bed for the DOE's federal labs. In any event it was a Republican Governor who was being offered assistance. The utility was approached in late 2007 and ultimately agreed to be part of the discussion.

In January 2008 the State of Hawai'i and the DOE announced, with great fanfare, their work together. A key part of that announcement was setting forth the goal of reducing fossil fuel use by 70%, with 40% coming from renewable energy use and 30% coming from energy efficiency. It was an audacious goal that a federal official appeared to have in essence made up, but it stuck and became the goal of the work. It is noteworthy that this goal appeared largely aimed at the 30% of fossil fuel to produce electricity. There were discussions about transportation but that work in no way approached 70% or even close to it and the third for jet fuel was not touched at all.

During much of 2008 a team representing the Governor and Hawaiian Electric were negotiating an agreement between the State, the Consumer Advocate and the utility. That deal was announced in October 2008, and represented a substantial set of changes for the utility. The utility agreed to a 40% renewable portfolio standard, to accommodate 400MW of wind coming from the neighbor islands to Oahu, to change its financial model to "decoupling," to

install a substantial number of solar water heaters, and a number of other actions.³

A measure of the seriousness of the occasion was provided by the appearance of U.S. Senator Daniel Inouye at the event. The Senator and the Governor were at that point clear adversaries and the Senator knew that by appearing he would be giving her event even more notice, and in fact the front page of the next day's papers featured a picture of the two of them. He did so because he was one of the leaders most frustrated by the failure of the nation and the state over the decades to make serious inroads on our dependence on the use of foreign oil.

The deal was to be executed over the following years and all aspects of it were the subjects of immediate work. The Governor wanted as much done as possible before her term ended in 2010. She certainly wanted done the change in the way the company was compensated, referred to as decoupling, and it was wrapped up in December of 2010.

The Governor was not eligible to run for a third term but to the surprise of many, the new Governor, Neil Abercrombie, immediately pledged to keep it going and did not in fact even change the terminology or even the name of the initiative. He clearly was moving to carry out its provisions.

There has been some level of success. Renewable energy percentages have grown to nearly 20% and are ahead of the schedule stipulated in the law. There has been an explosion in the use of solar resources, especially photovoltaics. And the use of smart grid/smart technologies is on the rise.

Many however feel that the Hawaii Clean Energy Initiative (HCEI), the overall title for this work, has lost momentum. And there is significant cause for concern. The rhetoric remains strong, the delivery not as strong. It is a tale of what happens when a laudable policy meets political reality

When Policy Meets Reality 2011 to 2015

What happened?

There has been no significant progress in bidding out the inter-island cable system. Such a system may or may not make sense but until there are bids on the table and actual dollar

³ It was also important that the utility was committed to a 100% renewable energy goal, that reaching any legal goals was the minimum to be done, and that the overarching goal was to be fully energy self-sufficient using local renewable fuels.

amounts to factor into our plans, it is all just speculation.

There have been no decisions made or contracts given out on geothermal. In spite of a remarkable realignment of Native Hawaiian views on this form of energy, after four years, there are still no agreements to proceed.

There has been no forward progress on resuming the tremendous strides once made with solar water heating. Much less expensive and intrusive than photovoltaic and well within the price range and capability of most households, and in some programs, of renters as well, this was once a source of great pride to Hawaii as we essentially lead the nation in the use of solar water heaters. In the frenzied PV market, solar water heating has been lost.

The work on smart meters is achingly slow in the main utility even though fully installed in the remaining market, the coop on Kauai.

And the once promising biofuels market was significantly harmed by adverse PUC decisions.

So again, what happened?

There are at least six factors and an emerging seventh that have most likely had some impact on the progress of HCEI

First, and probably most important, was the sudden and sharp rise in oil prices that occurred in the wake of the tsunami in Japan in March of 2011. In the wake of the tsunami and the problems that occurred in the shoreline nuclear plants, the Japanese government shut down its entire nuclear fleet and brought back on line an old fleet of oil-fired plants. The result was a dramatic surge in oil prices in the Asia-Pacific market, of which Hawaii is a part. Oil that had been in the \$100 to \$110 range jumped to over \$130. And it stayed there month after month. Historically Hawaii had faced high prices on occasion but they were always very short-term spikes that went down nearly as quickly as they went up. (There had been one in the fall of 2008 at the time that the energy agreement was signed but prices had gone back down by January 2009.)

As prices continued to stay up, consumer unhappiness grew. The PUC in particular viewed itself under pressure. There was a rate case hearing in the fall of 2010 that was particularly hostile and it appears to have left a lasting impression on the PUC.

In the succeeding days the move to renewables began to be qualified with “if they are less expensive.” The earlier sense that it was okay to make investments in the move to renewable

energy, even if it meant raising prices, was gone and in its place was a very deep-seated caution about price increases under any circumstances.

That led in turn to a virtual “freeze” on large capital projects (e.g., the cable), on anything that would place a new or increased surcharge on ratepayers, or anything that would come across as an additional amount on the bill.

The second factor that clicked in almost instantly was the location-based opposition, or NIMBYISM (not in my back yard....). Such opposition is to be expected with any major project. In the initial days, after the energy agreement and into the first period of the next administration, the political leadership of the State stood strongly behind the major projects (especially the wind farms) and was willing to accept the heat coming from the neighborhoods involved, assuming that the needs of the community were listened to and supported. In the case of one project -- the Lanai Wind Farm -- the utility and the landowner agreed to a set of community benefits that protected jobs, the essential rural character of the island, improvements to the water system, and related items.

The PUC was however struggling significantly with these projects. At one point it stepped in and rejected a deal that the administration and the parties had agreed on to allow for wind farms on two different islands. At that point, the work on one of the two islands came to a halt. Later work on the other island was put aside at least for a time as the owner of the property involved sold it to someone else. And while they retained development rights for the wind farm, the situation became much more uncertain.

The third reason was the lack of coordination within the new Abercrombie administration. It was clear fairly early on that the major players in the State administration -- the PUC, Consumer Advocate, the Department of Business, Economic Development and Tourism, and the Governor -- were not in agreement on what actions were important. For a period Lt. Governor Brian Schatz was able to bring all the parties together and coordinate their actions, but when he was appointed to the U.S. Senate that function ceased.

In the absence of coordination, the PUC in particular was acting in ways that were not in line with what the other parties, including the Governor, were seeking. Among other things, the denial of the first biofuel contract showed how far apart the executive branch parties had grown. All the other parties favored the contract, but the PUC rejected it anyway.

The consequences of this lack of coordination were felt not just within the administration but also by businesses looking to become involved in the renewable energy field. Normally if the State's chief executive, the Consumer Advocate and the head of the State's economic development arm all support a project, it would be assumed that a PUC, appointed entirely by that Governor, would support that project. Since that was not what was happening, it harmed the development of new energy.

The fourth factor was the increasing hostility of the PUC to the principal electric utility. Earlier there had been periods of challenge with Governor Lingle but the initial relationship between the utility and Governor Abercrombie was pretty good. The PUC that was appointed by the new Governor however became increasingly hostile. Rejection of the initial (and a revised version of it) biofuel contract, the rejection of a utility bill financed solar water heating program, and a series of decisions that included long "lectures" to the utility were all part of an increasingly tense environment.

The fifth factor was an increasing focus on Maui as a source of renewable energy. With the most aggressive Mayor, county energy coordinator, and a PUC Commissioner from the island, the clear bias towards having energy for Oahu come from Maui Island became more and more evident. Perhaps the high water mark was the decision to focus the inter-island cable consideration solely on Maui Island, skipping any consideration of the much more energy rich Island of Hawaii or the islands of Molokai and Lanai. It is clear that Maui has renewable resources, but that it should be the only island considered for connection to Oahu is hard to understand.

The sixth factor, one that is in many ways related to the first on high prices, was the increasingly major role that natural gas is playing in the debate. During his administration, Governor Abercrombie wrote a letter essentially ordering the utility to pursue natural gas as an option. Hawaiian Electric looked at it as a way of avoiding very costly capital projects to retrofit old oil plants in order to meet EPA requirements. The intent was to switch to a less polluting fuel, as opposed to adding scrubbers to the stacks. Later the emphasis switched to the notion that natural gas would be much cheaper than oil, thus saving ratepayers money.

Natural Gas

A couple of important notes about natural gas. First, advertisements by the local gas utility notwithstanding, natural gas is not green energy or clean energy. It is in every way a polluting fossil fuel. It is cleaner than coal certainly (hence its attraction on the mainland U.S.) and cleaner than oil, but it is no more consistent than oil with the goal of 100% renewable energy that Hawaii embarked on.

Secondly, while the environmental damage caused by coal is more visible because it is on the surface, the evidence of the environmental damage being caused by natural gas production is growing. If it, among other things, ruins drinking water supplies, its impacts could even be more devastating than coal. In any event, natural gas is no panacea, for Hawaii or for the world. We can and must do much better for our planet.

Still, Hawaii pursues natural gas in significant part because it is said that it will be cheaper for us. That notion needs to be significantly tested. If it is based on the \$134 barrel of oil, oil prices are falling worldwide so the numbers may need to be adjusted. And Prime Minister Abe's resounding victory in recent Japanese elections may give him the political strength to restart many of the nuclear power plants which would likely take the steam out of the inflated Asia-Pacific oil prices.

It is worth remembering that when Hawaii committed itself to oil, we did so because it was "cheap, American and available." We are hearing that same siren song again these days and we should remember exactly that: we have been here before and in the end it did not work out well for us.

The other big reason offered for natural gas is that it is a "transitional" fuel. We hear it so often that it has become an article of faith for some. The obvious question is in what way is it "transitional?" One key in answering that question is how much capital is involved? If we are asked to make significant capital investments, with a thirty-year payback, there is nothing transitional about it. That is a long-term commitment. If there are only minor capital additions

that is more consistent with the thought of a transitional fuel. So the public and the regulators need to be highly attuned to the proposals by the gas utility and the electric utility for any major capital additions for gas since they would call into serious question the transitional argument.

Recently there has been the added complexity of the proposal by NextEra Energy, a Florida based energy company, to buy Hawaiian Electric. The initial publicity put out by the two companies portrays NextEra as a renewable energy company, especially pointing to the solar and wind farms that they have built. What is more critical however for Hawaii is the behavior over the years of their operating utility, Florida Power and Light. Initial indications suggest that that portrayal needs a very careful examination. We need to be sure as a community that NextEra is in fact committed not just to the legal 40% goal but also the 100% renewable commitment that the company has repeatedly made. We will need to see the commitment to all renewables as well as to load reduction moves.

One interesting note is that there is some indication that NextEra may be trying to parlay its move from coal to natural gas in Florida as showing that the company is 100% “renewable,” a confusion they would not be alone in trying to make. NextEra is a big natural gas company and has suggested that it can use its buying power to get Hawaii better prices for any natural gas used here.

WHERE COULD WE GO NEXT?

The bottom line is that for a variety of reasons, the renewable energy promise of the 2004 -- 2010 period has not been sustained in the years since. Whether the next leadership of the PUC will be able to get it back on track remains to be seen.

In considering where we might go next in the energy area, we need to step back and remind ourselves about our energy picture. The key attributes to keep in mind are:

1. We are a very energy efficient state because we do not home heat and air conditioning remains unnecessary in most homes.
2. We need to attack the issue from the top down, reducing load as much as possible, as well as bottom up, using renewable energy in place of other sources for power generation. When we say 100% renewable it is important to see that in the context of meeting in the middle rather than simply assuming we have to find enough renewable

power to meet today's level of power generation and use.

3. We have a set of largely paid for power plants, some of which we can probably nurse along for another 20 or 30 years. We should take advantage of that since the odds of disruptive technologies dramatically altering the energy system are very high. Making major investments in what we know today (large new natural gas plants, for example) is just plain crazy.

Given these attributes, what are the critical steps that need to be taken?

We need a far more aggressive energy reduction program and especially a very, very aggressive solar water heating program targeted at those who cannot afford PV, and including a program aimed at renters. It is long past time for our energy programs to reach those for whom the size of the bill is even more of an issue than most of those who install PV.

We need to bid out an interisland cable system that covers all islands to determine what role, if any, cables should play in our energy future. Sitting around and debating it without actual proposals on the table makes no sense.

We need to give out a contract or two for geothermal energy on the Big Island as soon as possible. Again, we need to determine what role, if any, major geothermal use will play in our future. We need test wells drilled to determine the size of the resource, and that will only occur if someone has a contract for power with the utility to support those exploration costs.

We need to fully execute smart meter programs, the installation of grid-based batteries to make the greatest possible use of the solar energy generated anywhere in the system, and other grid and system features that allow us to maximize the efficiencies of the system.

We need to look at the potentials for distributed hydroelectric energy on the system, particularly in the agricultural water systems on each island.

We need to continue to explore the use of wind energy and of biofuels on the system. The earlier denials, in particular of biofuels, may need to be revisited, at least in concept.

And we need to reassert the goal of Hawaii's energy program being 100% locally renewable energy so that any interim actions taken for any reason (such as satisfying national environmental laws) are done in a way that does not detract from or delay those renewable goals.