

# Preface

Located over 2,500 miles away from any major landmass, the main Hawaiian Islands comprise the most remote population center with a developed economy in the world. In spite of this remoteness, communications satellites, frequent air transportation, and marine cargo services ensure the Hawaiian Islands' global connectivity. However, despite these external links, Hawaii's isolation has limited its energy options, with the result that the state is almost totally dependent on imported oil. The result has been that Hawaii consumers are burdened with the highest energy prices in the country. Reminders of this burden are no further away than a monthly electric bill or the next visit to the gas pump, so it is no surprise that energy is a frequent topic of discussion among Hawaii's politicians, major stakeholders, and the general public. On the surface, Hawaii's dependency and the price volatility of imported oil appears to be a straightforward economic and security argument for the substitution of abundant renewable resources for imported oil.

Some may ask why the State of Hawaii has not been more aggressive in its pursuit of increased energy security and lower energy costs. The answer is complex but involves familiar technical and institutional problems. First, the management of intermittent renewable energy sources like wind and solar resources on small isolated electricity grids is a formidable technical challenge. Second, a transformational energy policy must overcome sociopolitical and institutional barriers. Third, there are relatively few practical policy options available to small governments to effect change in the energy patterns of the transportation sector. Hawaii's attempts to reconcile these policy complexities have attracted national and international attention.

Hawaii's progress in integrating high penetrations of variable renewable resources like solar and wind on isolated island grids systems has resulted in the islands of Hawaii a laboratory for exploring renewable energy and climate change problems. In addition, the nature of island living and of the Hawaiian culture reinforces positive attitudes toward self-sufficiency, environmental protection, and conservation. These social and cultural attitudes are clearly favorable for the promotion of green energy alternatives. There a growing desire to seek aggressive measures to increase self-sufficiency and to address and mitigate climate change

impacts in Hawaii. But these green initiatives also come with a price tag, and some question the cost impacts of aggressively pursuing local green energy alternatives.

Since statehood, Hawaii's political focus on its energy policies and implementation has been primarily driven by two events. The first event involved the reaction to the 1973 oil embargo. This resulted in innovative energy policies and the development of key institutions to address energy concerns of the time. The second event was the signing of the 2008 Energy Agreement between the State of Hawaii, the U.S. Department of Energy, and the Hawaiian Electric Company...resulting in the formation of the Hawaii Clean Energy Initiative.

This book describes the Hawaii Clean Energy Initiative (HCEI), an ambitious program by the State of Hawaii to substitute "clean" energy, renewable sources, and energy efficiency, for imported petroleum. It is not intended to be a comprehensive or detailed policy history of HCEI; rather, this endeavor is based on the aspects of Hawaii's experiences which may be of interest beyond the State of Hawaii.

In writing this book, we had several objectives. The first objective was to present the historical context and the political and policy drivers of HCEI. The second objective was to explore and provide a more detailed analysis of the major policy elements of HCEI. This included the effects of negotiations between stakeholders, the early implementation tactics affecting electricity and transportation sectors, and the erratic experience in weaving climate change and greenhouse gas reduction regulation with renewable energy policy. As the energy landscape is not a static environment, another goal was to cover how strategic thinking adjusted to the dramatic changes in the energy markets in the 2014 and 2015 timeframe. During this period, oil prices declined and the United State's natural gas supplies expanded as a result of hydraulic fracturing technology. In addition, the Environmental Protection Agency implemented its Clean Power Plan, and utility consolidation was taking place in the U.S. electric power sector.

Finally, we wanted to include our personal observations on the general process of public policy formulation as it unfolded in HCEI. The formulation of public policy is not an easy task and often requires uncomfortable decisions and judgments in a dynamic environment. In Hawaii, as elsewhere in the world, energy policy is shaped by political agendas and ambitions, constrained by resource endowments, and dependent on institutional or organizational cultures. Due to the complex interaction of these factors, it is not always possible to sort out the origin or merits of one policy à-vis hypothetical alternative policies. While the passage of time may add clarity to the policy formulation process, there is no guarantee that the logic or factors behind important decisions will ever become entirely transparent. Therefore, we hope that our observations, while they may not seem remarkable, will provide some insight into an otherwise murky and often unclear area of government decision-making.

Since HCEI has spanned over five political election cycles, an attempt has been made to present important policy considerations in chronological sequence, using dates when policies were announced or major decision points became publically known, as key milestones. In some cases, a chronology based on public access may not be entirely accurate since it would not include the time period of analysis

and discussions that precede the major policy pronouncement. There is also the obvious problem of strategic decisions often changing; sometimes many times over. Readers may recognize the evolving nature of Hawaii's clean energy strategy within successive chapters of the book. For example, the initial cost and resource assessments presented in early chapters are different from estimates in later chapters. Likewise, political priorities and policy assumptions have changed, sometimes dramatically, over time and under the administration of three different governors.

As authors, we attempt to be objective and factual in describing the HCEI. However, we do recognize that our perspective and interpretation could be influenced by the roles that we played in the initiative. On reflection we have concluded that in several important aspects, our perspectives are complementary. On one side, policy development is viewed through the lens of the regulated stakeholder—the Hawaiian Electric Company (HECO). On the other side, the perspective is seen from a legislator's viewpoint and later, from the regulatory agency, the Hawaii Public Utilities Commission (PUC). It should be understood that both HECO and the PUC were in the position of having to implement directives outlined in statutory policy, which were heavily influenced by the executive branch of the state government. As a result, we saw the formulation of HCEI from the implementation rather than planning or strategic perspective. This is not to say that we did lack strong opinions about the logic or direction of specific policy assumptions. However, our primary concern has been with the practicality of achieving objectives, rather than with their conceptualization.

We write this book because Hawaii stands at the verge of a major energy transformation requiring a different paradigm that may alter the way we live, work, communicate and interact with providers and users of an essential service like electricity. Given the scale, scope, and complexity of Hawaii's energy transformation, the search for workable policies has led to some successes but also some notable shortcomings and omissions. Hawaii's success in crossing the energy transformation threshold will require that the strengths and weakness of HCEI be openly discussed and dissected, and that shortcomings be addressed. This book is an attempt to open a policy conversation on what went well and what might have been done differently during the early implementation of HCEI.



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