

2008 Innovations Awards Program APPLICATION

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ID # (assigned by CSG): 08-W-07HI

Please provide the following information, adding space as necessary:

State: Hawaii

Assign Program Category (applicant): Natural Resources (Use list at end of application)

1. Program Name

Energy For Tomorrow

2. Administering Agency

Department of Business, Economic Development, and Tourism, State of Hawaii

3. Contact Person (Name and Title)

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9. *Please provide a two-sentence description of the program.*

Energy for Tomorrow (EFT) launched an integrated, comprehensive, and strategic energy plan to end decades-long over-dependence on imported oil in Hawaii. It is providing "homegrown" energy solutions today, which will create a secure energy and economic future for the people of Hawaii.

10. *How long has this program been operational (month and year)? Note: the program must be between 9 months and 5 years old on March 1, 2008 to be considered.*

The *Energy for Tomorrow* policy package and plan was launched in January 2006.

11. Why was the program created? What problem[s] or issue[s] was it designed to address?

Hawaii's economic security and stability continues to remain extremely vulnerable to the increasing risks and threats to its energy security, due to Hawaii's overdependence on imported oil to meet approximately 90% of the state's total energy demand. This vulnerability is exacerbated, because nearly 77% of the state's electricity is generated using petroleum fuels. These factors create unacceptable risks to Hawaii's economy, and energy security remains a priority.

To address these risks Governor Linda Lingle's *Energy for Tomorrow (EFT)* policy package and plan was created to fundamentally change how Hawaii consumes energy, by encouraging and supporting market-based development of reliable, cost-effective, and self-reliant energy for Hawaii.

The complexity and interrelatedness of Hawaii's energy systems and markets is reflected in the comprehensive scope and integrated nature of the *EFT* plan. *EFT* implementation initiatives, activities, and programs involve actions by and affect all energy industry sectors, and consumers, and have required coordinated actions by state agencies – administrative and regulatory.

Execution of the program is based on comprehensive and integrated coverage of all energy sectors, and technical depth and detail to identify the most potent policy "levers" – changes and new initiatives – that go to influence and produce targeted outcomes and results.

When fully implemented by 2020, the conservation, alternative transportation fuels, and renewable energy components of the State's new strategic energy plan will have displaced the importation of 110 million barrels of crude oil, retained \$6.32 billion in our economy (that otherwise would have been used to purchase oil), eliminated 49 million tons of carbon dioxide emissions, and result in 65,700 job-years of employment.

The *EFT* plan seeks to achieve results over the near-, mid-, and long-term. It has established a bold and strategic energy policy framework of measures to encourage and support market-based development of reliable, cost-effective, and self-reliant energy systems. Its main components include:

- *"Savings through Efficiency"*
 - *"Independence through Renewable Energy"*
 - *"Fuels through Farming"*
 - *"Security through Technology"*
 - *"Empowering Hawaii's Consumers"*
- *"Savings through Efficiency"*: Direct Improvement of the State of Hawaii's Energy Efficiency and Provide Incentives for Consumer Energy Efficiency.
- a. The "Lead By Example" Initiative: Improve Energy Efficiency in State Facilities and Vehicles by:
- (1) Directing that new State building construction strive to meet the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) guidelines, with a goal to achieve Silver certification;
 - (2) Retrofit and renovate existing State facilities using energy efficient design and equipment;

- (3) Require solar water heating on State facilities where cost-effective;
 - (4) Require that all new residential facilities three stories and below, built using any portion of State funds and/or located on State lands, meet minimum roof and wall standards to prevent heat gain and, if air conditioned, minimize cool air loss. Working with Counties to adopt similar requirements in their building codes;
 - (5) Purchase environmentally preferable products;
 - (6) Include waste management programs for all construction and demolition projects;
 - (7) Incorporate reduce, reuse, and recycle as a standard operating practice; and
 - (8) Promote purchase of fuel-efficient vehicles and use of alternative transportation fuels.
- b. Amend State Energy Tax Credit Law to remove the sunset date and increase the dollar cap.
 - c. Establish advanced pricing tariffs.
 - d. Re-direct existing utility-managed demand-side management surcharge to more directly support energy efficiency and renewable energy programs for electricity customers.
 - *“Independence through Renewable Energy”*: Significantly Increase Use of Renewable Energy Resources.
 - a. Require Renewable Portfolio Standard targets be achieved by electricity generated by renewable energy resources only, and remove energy efficiency gains from the definition of renewable resources.
 - b. Conduct an inventory of State lands available for renewable energy; establish renewable energy resource development sub-zones; and streamline permitting, including elimination of contested case provisions.
 - c. Streamline permitting of renewable energy projects.
 - d. Governor Lingle directs the Hawaii Public Utilities Commission to pursue utilities' sharing of the risk of oil price increases through modification or elimination of the fuel price adjustment clause, and de-link the payment of oil-based avoided cost to renewable energy producers and developers.
 - e. Work with local producers to stimulate the production of energy crops and use of agricultural waste streams for energy.
 - *“Fuels through Farming”*: Develop and Increase Use of Alternative Transportation Fuels.
 - a. Require that State of Hawaii diesel fuel purchases include a purchase preference for biodiesel blends.
 - b. Offer incentives for purchasers of gasoline-efficient hybrid and alternative fuel vehicles.

- c. Enact a Hawaii Renewable Fuels Standard of 20% of the State’s highway fuel demand to be provided by renewable fuels by 2020. Interim standards would be 10% in 2010 and 15% in 2015.
- d. Extend the expiration date for the alcohol fuels State excise tax exemption.
- e. Study potential for ethanol and biodiesel production in Hawaii for motor fuels, electricity production, and as a potential hydrogen carrier for the future.
 - “*Security through Technology*”: Establish Hawaii as Leader in Renewable Energy-to- Hydrogen Research, Development and Deployment.
- a. The Vision: Establish a world-class renewable energy-to-hydrogen program in Hawaii, and through the development of hydrogen as an energy carrier, provide for the long-term energy security of the State.

Hawaii's combination of abundant renewable resources, high fossil fuel prices, limited geographic area and recognized expertise in hydrogen technology research and development makes the State an ideal leader for a world-class renewable energy-to-hydrogen RD&D program.

The hydrogen component of this comprehensive energy program positions Hawaii as a leader in hydrogen production and use technologies based on the State’s renewable energy resources. The result for Hawaii will be a thriving hydrogen technology sector; public and private investment capital drawn into this sector; higher-paying professional and technical jobs; energy security, reliability and self-sufficiency; and net export of energy.

To date small, but significant steps to advance this initiative have been taken by DBEDT in partnership with the U.S. Department of Energy. HCEI outline goes here.

The Governor’s and Legislature’s commitment to support HCEI will significantly ramp-up activity. The initiative/program will plan, implement and/or conduct a range of developmental activities including:

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To catalyze and ensure longer-term program sustainability, a seed hydrogen investment capital fund was established to co-invest in renewable energy-to-hydrogen technologies, to develop Hawaii-based intellectual property (IP), to leverage or provide state match for federal funding and to partner with private sector for research, development, testing and deployment of renewable hydrogen systems in Hawaii. Additional capital will be raised from private investors.

This fund distinguishes Hawaii’s hydrogen development efforts, call attention to the State’s vision, attract RD&D proposals and prospects and enable Hawaii to capture these technology-development opportunities.

- “*Empowering Hawaii’s Consumers*”: Provide Hawaii consumers and regulators with pricing information by improving petroleum/ energy industry and market transparency and competition.
- a. Replaced gasoline price caps with legislatively-mandated monitoring program to achieve petroleum industry and market transparency.

- b. Develop petroleum and energy industry data, information database and analytic system for total energy systems to support informed policy decisions and all programs' assessments of renewables, energy efficiency, leading to hydrogen in long term.
- c. Repeal Divorcement (Anti-Encroachment Law).

Bottom line: The *EFT* policy package has had the effect of accelerating the production of renewable and alternative energy, increasing energy efficiency, developing and adopting new technologies and ensuring the State's energy security, which comprise the net goals of the energy statutes enacted in 2006 and 2007.

12. Describe the specific activities and operations of the program in chronological order.

September 2004: Governor Linda Lingle signed a law requiring at least 85 percent of Hawai'i's gasoline to contain 10 percent ethanol beginning in April 2006. Read a [news release](#).

January 2006: Governor Lingle announced a bold and strategic energy plan, which encourages and supports market-based development of reliable, cost-effective, and self-reliant energy for Hawai'i. This marked the beginning of Hawai'i's Energy For Tomorrow effort. Read a [news release](#).

Mid-2006: Governor Lingle signed four bills that launched Hawai'i forward in her Energy For Tomorrow initiative. The legislation mandated a focus on clean energy use and energy efficiency by state government, required necessary changes in the energy regulation sector, offered tax incentives for renewable energy and provided funding for renewable projects.

October 2007: The U.S. Department of Energy assigned a senior energy specialist to work with the State of Hawai'i to help implement the Lingle-Aiona Administration's Energy for Tomorrow program. Read a [news release](#).

June 2007: Governor Lingle signed the Global Warming Solutions Act, which established a task force to assess greenhouse gas emissions in Hawai'i and develop a regulatory scheme to significantly reduce emissions. The statewide objective is to collectively reduce emissions to the 1990 level by the year 2020.

July 2007: Governor Linda Lingle announced that the Public Utilities Commission opened an investigative docket to explore ways for state and local government facilities to purchase electricity from renewable energy sources from providers other than the electric utility. Read a [news release](#).

January 2008: Governor Lingle announced an historic plan to develop large solar power arrays at 12 locations. Under the plan, the state Department of Transportation is soliciting proposals from private companies to develop photovoltaic systems that could generate as much as 34 megawatts of electricity at 11 DOT sites, as well as the Hawai'i Foreign-Trade Zone in downtown Honolulu. Read a [news release](#).

January 2008: State targets 11 government buildings on four islands – including the State Capitol – as priorities for “retrocommissioning” and will identify opportunities to save energy in state buildings and reduce operating costs. Read a [news release](#).

January 2008: Governor Lingle and U.S. Department of Energy Assistant Secretary for Energy Efficiency and Renewable Energy Alexander Karsner signed a Memorandum of Understanding establishing the Hawai'i Clean Energy Initiative, a long-term partnership designed to accelerate the transformation of Hawai'i into one of the world's first economies based primarily on clean energy resources. Hawai'i is the only state to have such a partnership with the DOE. The goal of the Hawai'i Clean Energy Initiative is to use renewable resources – such as wind, sun, ocean, geothermal, and bioenergy – to supply 70 percent or more of Hawai'i's energy needs by 2030. Read [more](#).

January 2008: Hawai'i hosts the Major Economies Meeting on Global Security and Climate Change, attended by officials from the world's 16 largest economies and the United Nations and European Union. Governor Lingle gives opening remarks and shares the progress and plans for clean energy in Hawai'i, sharing that the state aims to be a model for the world. Watch the Governor's [remarks](#) at this meeting.

February 2008: Governor Lingle hosts a news conference for the announcement of the nation's first wave energy project, which will consist of floating platforms off the coast of Maui that can produce enough power for 2,700 homes. Watch this [news conference](#).

February 2008: The National Governor's Association Annual Conference is held in Washington, D.C. with the focus of "Securing a Clean Energy Future." Governor Lingle is one of eight Governors on a special task force focused on energy solutions for America.

13. Why is the program a new and creative approach or method?

EFT is genuinely a groundbreaking energy policy strategy. Committed leadership by Governor Lingle and the Hawaii State Legislature, and backed by professional policy and quantitative analyses, identified the interrelated energy policy "sweet spots", particularly oil price-based risk avoidance/pass-through inequities, and provided new and creative, and [workable](#), technical solutions – both "carrots and sticks" – to what has been an intransigent problem for many states.

There was also recognition by *EFT* leadership of how the energy industry's – particularly regulated utilities – avoidance of risk exposure to high and volatile oil price had become complicatedly integrated into state energy policy due to Hawaii's primarily oil-based energy systems.

Important to this process was the coordination and consensus-building strategy used early on to obtain broad-based support for significant changes to long-standing energy policies. As an example, in advance of the 2006 Legislative Session there was extensive collaboration, and consensus, among a wide variety of public and private parties statewide of the need for an "energy charge" to dramatically enhance Hawaii's overall energy efficiency, substantially accelerate the development of Hawaii's indigenous energy resources, and significantly reduce Hawaii's energy dependence on imported fuels.

14. What were the program's start-up costs? (Provide details about specific purchases for this program, staffing needs and other financial expenditures, as well as existing materials, technology and staff already in place.)

EFT start-up costs were approximately **\$675,000**. This includes:

1. Funding toward improving energy efficiency in State facilities and vehicles ("Lead By Example" initiative)

Funding for training, technical assistance and workshops for state employees in the areas of energy efficiency, renewable energy and transportation efficiency.

Total Funding \$500,000

2. Staffing – 2 FTE positions

1 Energy Analyst (Buildings and Environmental). Programmatic responsibilities include energy policy, building efficiency and environmental preferable practices and procurement.

1 Energy Analyst (Renewables and Efficiency). Programmatic responsibilities include promotion and implementation of the use of renewable energy resources and technologies and energy efficiency technologies and practices

Total Salary and Fringe \$175,000

15. What are the program's annual operational costs?

Start-up funding was appropriated for a biennium, and contracts with consultants are for two years. Therefore, annual operating costs are approximately \$250,000 for funding for training, technical assistance and workshops, and \$175,000 annually for staff for the EFT initiative in energy efficiency in state facilities and vehicles. In-kind assistance from staff from the Department of Business, Economic Development, and Tourism, and the use of existing resources is not calculated in this estimate.

Total annual operational costs: approximately \$425,000

16. How is the program funded?

State of Hawaii General Funds are the sole funding source for the EFT initiative. The funding for training and workshops and for full-time staff was awarded by the Hawaii State Legislature as a result of bills passed as part of the EFT omnibus legislative package in 2006.

17. Did this program require the passage of legislation, executive order or regulations? If YES, please indicate the citation number.

To address these decades-old issues, the leadership of *EFT* had to incorporate policy initiatives requiring coordinated legislative, administrative, and regulatory actions to break these oil-based policy linkages, as well as incentives to reward private sector investments and actions in favor of energy efficiency, indigenous renewable energy resources, and sharing the risks of oil dependency rather than just consumer pass-through.

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18. What equipment, technology and software are used to operate and administer this program?

The implementation and administration of the EFT initiative does not require any additional or specialized software or equipment.

19. To the best of your knowledge, did this program originate in your state? If YES, please indicate the innovator's name, present address, telephone number and e-mail address.

Yes – these innovations can be principally attributed to three people:

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20. Are you aware of similar programs in other states? If YES, which ones and how does this program differ?

While numerous states are pursuing various energy policies, we know of no state with as comprehensive policy framework for transforming the state's energy environment.

21. Has the program been fully implemented? If NO, what actions remain to be taken?

The *EFT* plan seeks to achieve results over the near-, mid-, and long-term. Its components continue to actively evolve with cooperative efforts over different branches of state governments and the increase of partnerships with the private sector. To transform Hawaii's energy infrastructure and its economy, much remains to be done in the period between now and 2020. Staff of state agencies continue to implement projects and activities that began in 2006 (see timeline, #12, above and #22 below). The administration has identified some key areas and additional opportunities to conserve energy, encourage renewable energy development, preserve natural resources, and increase energy security.

For example, in the 2008 legislative session, the administration is proposing the following measures as part of the five areas of its ongoing *EFT* plan:

- *“Savings through Efficiency”*

Agencies are seeking additional funding for the Lead By Example initiative for energy and resource efficiency in state facilities. The funds will support ongoing technical assistance, training and case studies in green building, renewable energy, environmentally preferable procurement and financing of efficiency and renewable projects.

- *“Independence through Renewable Energy”*

Hawaii has a generous tax incentive program for solar water heaters. However, lower income households, many seniors, and those living on fixed incomes may not owe the State taxes and, thus, cannot take advantage of this program to put a solar water heater in their homes. The State is proposing to remedy this by allowing persons who do not owe taxes to use the solar water heater credit as a refundable tax credit.

Another legislative proposal is to expand the successful “pay as you save” solar water heater program to photovoltaic systems. Currently if households install solar water heating, they can pay for the cost of the installation each month through an extra amount that is added to their utility bill. This spreads the costs out as an installment payment plan. The Administration is proposing to allow the “pay-as-you-save” payment program through your utility bill, to apply to these photovoltaic systems, similar to the current program for solar water heater installations.

- *“Empowering Hawaii’s Consumers”*

Restructuring Energy Programs. Governor Linda Lingle’s administration seeks the creation of a new Energy Division within the Department of Business, Economic Development and Tourism. Two legislative proposals will provide this staff with heightened authority to obtain and analyze data from power regeneration facilities and the transportation sector, as well as better determine when and how energy-related shortages and emergencies should be managed.

- *“Security through Technology”*

In January, 2008, the State of Hawaii signed a Memorandum of Understanding (MOU) with the U.S. Department of Energy to establish the **Hawai’i Clean Energy Initiative (HCEI)**, a long-term partnership designed to accelerate the transformation of Hawai’i into one of the world’s first economies based primarily on clean energy resources.

The goal of the Hawai’i Clean Energy Initiative is to use renewable resources – such as wind, sun, ocean, geothermal, and bioenergy – to supply 70 percent or more of Hawai’i’s energy needs by 2030. This will reduce the state’s dependence on imported oil and help bring energy price stability to Hawai’i consumers. Implementation actions currently underway include the formation of four working groups who will formulate a strategic implementation plan, and coordination with government and private sector partners on strategic projects related to efficiency, electric generation, energy delivery and transportation.

- *“Fuels through Farming”*

In 2006, the *EFT* program included incentives for Hawaii to grow more of the fuel it uses, by including biofuels in the definition of renewable energy. This measure assumed that the growing of the feedstock and the fuels production facility would be co-located. In actuality, fuels may be grown in locations different from the area where the industrial production takes place. The Administration is, therefore,

proposing a bill that would expand the definition of renewable energy producer to include growers and producers of organic materials used primarily for the production of biofuels or other fuels. This will allow growers to lease public lands through direct negotiation, rather than public auction, and also allow them to use some of their organically grown materials for other purposes such as mulch or animal feed.

22. Briefly evaluate (pro and con) the program's effectiveness in addressing the defined problem[s] or issue[s]. Provide tangible examples.

All of the targeted outcomes can be achieved, and benefits of significantly reduced dependence on imported oil can finally be achieved for Hawaii. Ultimately, Hawaii can achieve greater energy self-sufficiency by sustainably developing its own clean, indigenous renewable energy resources.

The *EFT* initiative includes immediate and short term programs and actions as well those which will take more time to fully implement. The program has seen notable achievements in the first two years since its inception in the five focus areas outlined in (11) above. Some of the recent achievements that have resulted from the *EFT* policy and plan are described below.

Efficiency in State Facilities (Lead By Example)

- The state is targeting 11 State of Hawai'i buildings on four islands – including the State Capitol – as priorities for “retrocommissioning.” This will involve identifying opportunities to save energy in state buildings and reduce operating costs. Retrocommissioning will also improve occupant comfort, extend equipment service life and reliability, and reduce the volume of emergency or trouble calls for maintenance staff. The 11 buildings contain more than 1.4 million square feet of space and consume about 33 million kilowatt hours of electricity annually. This represents between 14.4 and 36.9 kilowatt-hours of electricity per square foot annually, and operating costs ranging from \$2.50 to \$6.27 per square foot per year.
- Six state buildings have received ENERGY STAR® awards from the U.S. Environmental Protection Agency, acknowledging that they rank in the top 25% of similar buildings nationwide.
- In 2006, the Department of Accounting and General Services (DAGS) constructed their first Leadership in Energy and Environmental Design (LEED™) Certified facility, the Waipahu Intermediate School Cafeteria, which the Department of Education (DOE) now operates. To date, four state buildings have been verified as LEED Certified or higher. Over twenty additional buildings are in the design, planning or construction phases with the goal of attaining LEED certification.
- In 2007, the Department of Education initiated a share-the-savings pilot project at 15 schools during the second semester of the 2006-07 school years. Participating schools received an energy audit and tracked their electrical energy consumption; those which exceed conservation targets will be able to spend a portion of the savings at their discretion.
- Energy assessments have been completed at a number of state buildings, including the State Capitol, with recommendations for efficiency upgrades. The Capitol's annual electric bill exceeds \$1 million; 51% of the electricity is used for HVAC and 34% for

lighting. A variety of lighting and air conditioning improvements, among other measures, are proposed. The State Capitol is among five retrocommissioning projects undertaken by DAGS.

- DBEDT has helped the Hawaii Public Housing Authority prepare a request for proposals for performance contracting, and has briefed other agencies on how to implement similar contracts. The HPHA request for proposals is unique in Hawaii because it involves federal funding and also addresses federal housing requirements.

Independence through Renewable Energy

- As part of the administration's focus on energy efficiency and renewable energy in EFT, Hawaii Governor Linda Lingle has unveiled a plan to develop large solar power arrays at 12 locations around the state. The power purchasing agreement award for the State Department of Business, Economic Development and Tourism and Department of Transportation was made in February 2008 to SunPower Corporation to develop 12 sites which will generate over 12 megawatts of photovoltaic power at Honolulu, Kona, Lihue, Kahului, Molokai and Kalaeloa airports along with Highway's Oahu and Kauai baseyards and the Harbors/Foreign Trade Zone Pier 2 facility. This is one of the largest projects of its kind by a government agency in the nation.
- In 2007, the Public Utilities Commission began consideration of "wheeling" electricity through the utility grid between state facilities. Wheeling is not currently practiced in Hawaii, but if renewable energy could be generated on state facilities—for instance, if wind turbines could be installed on state land—and transmitted to other state facilities, renewable energy could be utilized more fully by state agencies.

Training and Technical Assistance

- There were 89 training and educational events funded as part of the Energy Efficiency in State Facilities component of *ETF* in FY 07. These events included: training or technical assistance events and case studies; 12 documents prepared focusing on energy efficiency, green building, and commissioning; and seven documents which were for the purpose of data collection or inventory of State energy use. A total of 3,433 persons attended these activities, including a high percentage of personnel from State agencies, but also including those from the private sector and public.

Need for Adequate Implementation Resources

- Barriers to the implementation of the EFT remain. State agencies are committed to the EFT effort, but future results depend on securing adequate implementation resources, including programmatic funding and personnel. Funds for capital improvements, maintenance, and retrofits must be appropriated for energy efficiency and renewable energy goals to be reached. High-priority projects for the future include lighting, LEED commissioning, improvements such as window tints and energy management controls, and renewable energy installations.

23. How has the program grown and/or changed since its inception?

In the two years since its inception, the EFT has continued to strongly pursue implementation of its primary five focus areas:

- *“Savings through Efficiency”*
- *“Independence through Renewable Energy”*
- *“Fuels through Farming”*
- *“Security through Technology”*
- *“Empowering Hawaii’s Consumers”*

Notably, the Hawaii Clean Energy Initiative, described above, a new long-term partnership with U.S. Department of Energy, represents how EFT continues to expand. The ambitious goal of having 70% or more of Hawaii’s energy come from renewable sources, clearly builds upon the early successes of the EFT program. The HCEI leverages resources available to the state from federal agencies, building upon successful past projects and strong relationships with entities across sectors in seeking to transform our economy, provide much greater energy security and protect our island environment.

Additionally, EFT has gone far beyond its Hawaii focus and now includes a measure to curb Hawaii’s contributions to global warming. In 2007, the legislature, with support from the Administration and public, passed Act 234, the “Global Warming Solutions Act,” an enforceable, economy-wide greenhouse gas emissions limit that will bring the state’s emissions to 1990 levels by 2020. It is expected that this law will also help the state position itself for the coming technology-rich clean energy economy, staying ahead of the curve and implementing early actions in tracking and measuring carbon. Only two other states have enacted this type of measure. This response to a growing tide of concern about climate change worldwide demonstrates how EFT is growing and changing as new knowledge, national policy circumstances and opportunities in clean energy arise. EFT has well positioned the state to innovate its economy and dramatically decrease its contribution to global climate change.

24. What limitations or obstacles might other states expect to encounter if they attempt to adopt this program?

Not every state has the breadth of renewable energy opportunities that Hawaii enjoys; conversely, no other state has such a high dependence on petroleum.