



COLLEGE OF SOCIAL SCIENCES
HAWAII ENERGY POLICY FORUM
UNIVERSITY OF HAWAII' I AT MANOA

Opportunities for Improving Access to Energy Efficiency

Working Group on Efficiency of the Hawaii Energy Policy Forum

As part of the Hawaii Energy Policy Project, a working group was formed to address the issue of Improving Access to Energy Efficiency. The working group consisted of representatives from federal, state and local governments, the building industry, Honolulu Community Action Group (HCAP) and utility personnel. The primary focus of the working group was low-to-moderate income families in the residential sector. As the group explored the issues related to energy efficiency, it became apparent that the majority of residential energy users in Hawaii also faced many of the same challenges encountered by lower income families.

The group explored the challenges with the adoption of energy efficiency and several barriers were identified. One of the major issues identified was the higher initial costs of energy efficiency measures such as solar water heating and high efficiency refrigerators. This initial cost challenge is even more significant for lower income households. For renters, this barrier is amplified because the landlord lacks incentives to make an investment that will result in savings for a tenant.

Awareness and understanding of energy issues, knowledge of newer energy savings devices, and the full impact of energy use created barriers for change. In some cases, engineers and architects are reticent to specify new technology due to perceived risk if something goes wrong. The group concluded that consumers and designers could make better decisions provided with better information.

Despite the challenges, many successes were noted. Utility Demand Side Management (DSM) programs and tax incentives have resulted in more solar water heating per capita being used in Hawaii than any other state. Adoption of the model energy codes has meant that new construction and renovation are more efficient. More and more architects and engineers are learning about energy efficient designs and sustainable practices. Recently, the City and County of Honolulu initiated a program for low interest loans for qualifying low-income home-owners and landlords who rent to qualifying tenants.

The working group identified the following opportunities for consideration:

- Opportunity 1 – Implement Energy Awareness and Education Program**
- Opportunity 2 – Encourage Revisions to LIHEAP**
- Opportunity 3 – Continue Current DSM Programs Offered by Utilities**
- Opportunity 4 – Consider New Utility DSM Programs**
- Opportunity 5 – Seek Additional Sources of Federal Funding**
- Opportunity 6 – Enhance Current and Develop New Public-Private Partnerships to Encourage Energy Efficiency and Conservation**
- Opportunity 7 – Reduce the Tax Burden of Hawai'i Residents by Making Energy Cost Reduction a Priority for State and County Governments**
- Opportunity 8 – Create Additional Low-income Loan Programs**
- Opportunity 9 – Expand the Scope of the Model Energy Code**
- Opportunity 10 – Multi-family Housing Unit Design**

To see the full report go to the Hawaii Energy Policy Forum's website at:

http://hawaiienergypolicy.Hawaii.edu/eewg_rpt.pdf >



THE \$3.0 BILLION EFFICIENCY PRIZE

Hawaii's \$3.5 billion annual energy bill represent a massive, regressive tax to Hawaii, equal in magnitude to nearly the *entire* general fund taxes. Hawaii can reduce its energy bill by 17%, save \$230 MM/yr or \$3.0 billion¹ in energy costs over a 20 year period, eliminate 7-8 million barrels of oil *per year* by 2023, reduce CO2 emissions by 23 million tons (achieving a Kyoto-compliant economy by 2023), and add 2,800 new skilled jobs. The savings are equally split between transportation and electrical efficiency. These initiatives will return \$500/capita to Hawaii's taxpayers by 2023. Energy efficiency is *clearly* the lowest cost alternative to providing real energy security and improving environmental quality.

The purpose of Rocky Mountain Institute's study on Hawaii's transportation and electrical efficiency options is to provide policy makers with a clearly defined set of options to capture the energy efficiency prize. Neoclassical prescriptions for implementation of energy policies using prices, taxes, regulation, and deregulation are well known but politically fraught, though authentic competition in the context of a least-cost strategy can be effective. Yet unknown to many analysts and policymakers is a powerful new portfolio of other ways to accelerate energy efficiency and renewable options, giving Hawaii the opportunity to back out entire barrels of oil and improve its energy security.

Capturing the efficiency prize is remarkably straightforward. The total cost for the recommendations below, including foregone gasoline taxes and the costs of the efficiency measures is less than 30% of the value created. Our recommendations:

What the Legislature can do:

- Enact feebates for hybrid vehicles that sunset when market penetration reaches 10%
- Enact a mandatory tire labeling program
- Enact Appliance standards for minimum efficiency
- Authorize public financing of energy efficiency and renewables

What the Regulators can do:

- Eliminate the two year payback rule
- Make the IRP process an enforceable guide for future utility actions

¹ Present valued at 5% discount rate over 20 years

- Eliminate utility disincentives for conservation through revenue decoupling and create positive shareholder incentives
- Require all source bidding for megawatts and negawatts

What the State and County Government can do:

- Fully fund and resource the DCA and PUC
- Provide leadership by making state facilities and fleets energy efficient , financing state building initiatives and mandating efficiency for government and school vehicles

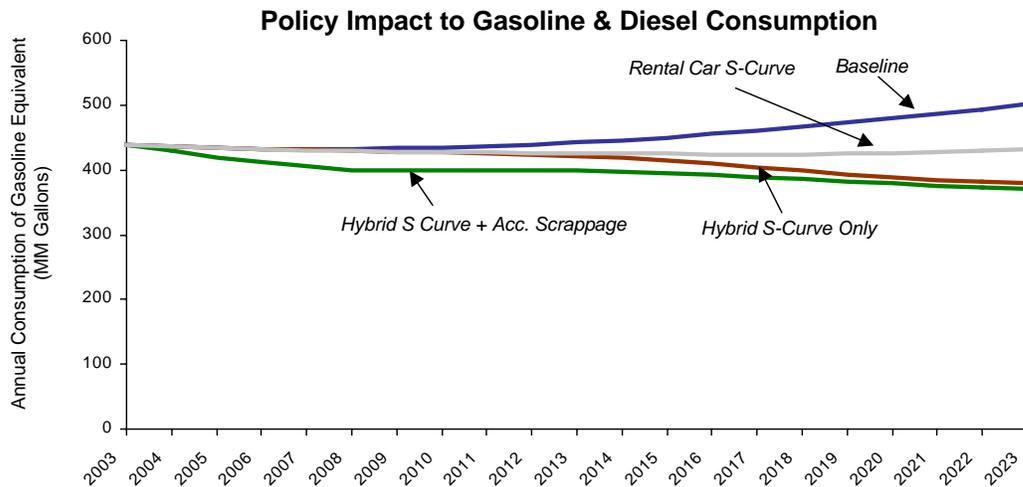
What the Hawaii's energy companies can do:

- Implement new set of DSM programs based on national best practices
- Correctly define full costs and risks in upcoming IRP process
- Prepare for shift in petroleum product demand

TRANSPORTATION EFFICIENCY

The scope of the Rocky Mountain Institute's study was solely on fleet efficiency, and mass transportation. The critical issues in transportation efficiency are accelerating the turnover of the existing automotive fleet, and increasing the market penetration of more efficient vehicles within each car class. In the absence of government action, Hawaii will consume 18% more motor fuel by 2023, because there will more cars on the road and more of them will be SUVs or light trucks. The current wells-to wheels efficiency of the existing internal combustion engine car is only 14%. Hybrid vehicles will increase the wheels to wheels efficiency to 24%. Hybrid technology combined with high efficiency diesel engines could raise this to 29% - doubling existing efficiency. Hybrids will be available in most classes of vehicles by 2005. Therefore, the issue is what incentives are needed to accelerate adoption.

The Rocky Mountain Institute evaluated several policy cases, and determined that the combination of accelerate scrappage of older vehicles plus incentives for adoption of hybrid vehicles provides the maximum benefit to the citizens of Hawaii



	Motor Fuel Consumption (2004-2023) MM Gallons	Motor Fuel Savings 2004-2023 MM Gallons	Fleet Efficiency (mpg)
Baseline	9,507	-	26.0
Acc. Scrappage	8,699	808	34.4
Hybrid S-Curve Acceleration & Scrappage	8,349	1,158	35.1
Rental Car Hybrid S-Curve Acceleration (10% in 2009)	8,994	513	30.2

In addition, Hawaii can do a few simple measures, such as mandatory labeling of low rolling resistance tires (which increase fuel efficiency by 5% at no extra cost), and public awareness campaigns around low viscosity oils and proper tire inflation. RMI also recommends that the counties specify rubberized asphalt for road paving, which uses half the asphalt and lasts twice as long, saving money and reducing oil demand.

The total cost of the measures, which is mostly foregone gasoline tax, is <30% of the value they provide. This understates the benefit, since we have not included oil price volatility or the second order benefits to the local economy of returning \$1.5 billion of disposable income to consumers.

	Policy Impact			Benefit		Costs	
	Cum. Gallons Saved (MM)	# of Add'l Vehicles Scrapped	# New Vehicles Receiving Incentives	HI Taxpayer Savings (\$MM)	Gasoline Tax Forgone (\$MM)	Scrappage Costs (\$MM)	Incentive Costs (\$MM)
Accelerate HEV adoption up to 10% penetration	928	-	21,929	1,058	152	-	25
Accelerate HEV adoption up to 10% penetration and accelerated scrappage to 95% of new cars (30% increase over current rates)	1,285	153,383	26,646	1,463	214	62	30
Provide focus incentives to rental car companies to adopt 10% HEV by 2009	513	-	8,605	513 ⁽¹⁾	131	-	11
Accelerate FCV adoption starting in 2010 up to 10% penetration	130	-	16,590	996	145	-	12
Promote low rolling resistance tires and tire inflation ⁽³⁾	16	-	-	24	4	-	- ⁽²⁾

Note:

- (1) Benefits accrue to rental car drivers, not Hawaii general population
- (2) Restricted to marketing/overhead costs
- (3) Assumes 30% of vehicle fleet has suboptimally inflated/designed tires, of which 30% would be responsive to a tire campaign. Assumes efficiency savings of properly spec tires of 5%

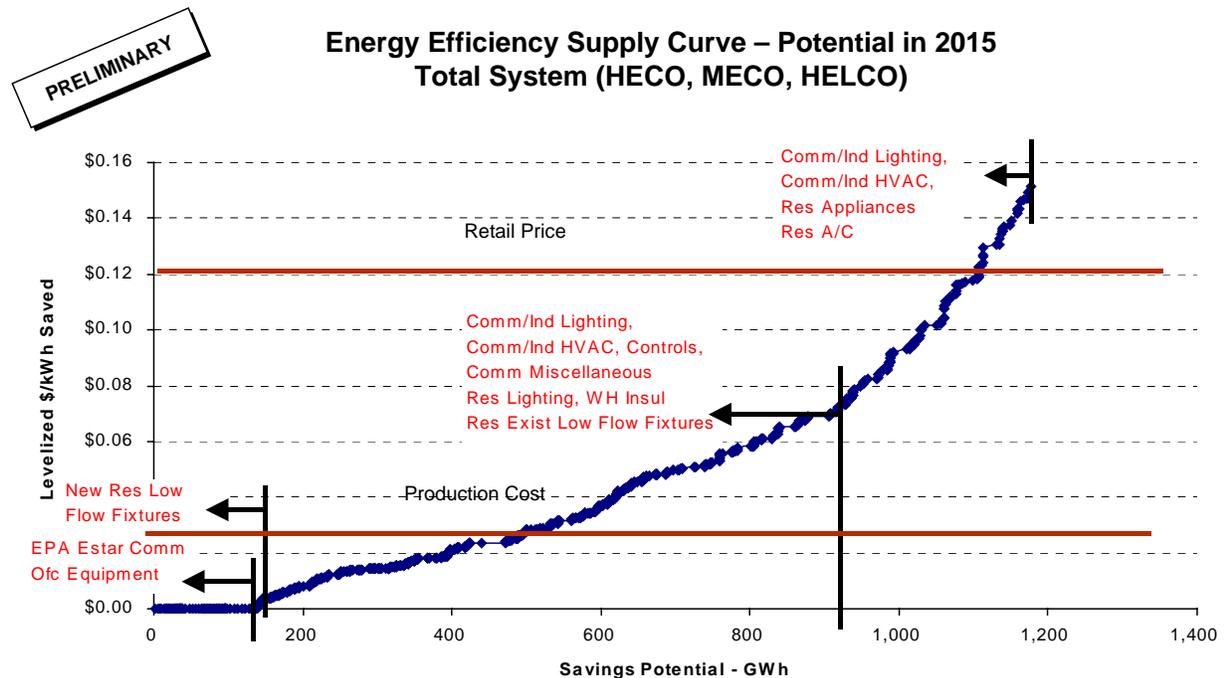
Assumes 5% discount rate, 1% inflation rate for motor fuel gasoline

Assumes scrappage program of \$500 per car, and tax credits of \$1,500 per HEV

ELECTRICAL EFFICIENCY

Since demand side management (DSM) incentives were provided in 1996, Hawaii's utilities have successfully captured over 30 MW (>135,000 Mwh) in the last decade. Hawaii is the leader in solar water heating with over 20,000 homes installed. Thus, we should be proud of our accomplishments and recognize the value of regulatory incentives in helping to achieve them.

There is still more work to be done. Based on the preliminary findings from Global Energy Partners, there remains the potential to save at least another 12% of energy demand (1780 GWh, 280 MW by 2023), through a series of measures that would cost on average 4 ¢/kWh. Even more remarkable, we can save nearly 500 GWh for a cost of 1.4 ¢/kWh – which is half the cost of sending the fuel through the power plants!



Source: Global Energy Partners, 2003

The issue is how to capture these savings. Our state's utilities have the opportunity to learn from others and incorporate the best practices into our next generation of programs. Most importantly, the utilities need to understand the full distributed value

of energy efficiency, distributed and renewables resources. and must take more sophisticated approach to the upcoming Integrate Resource Planning process. If the planning process is done correctly, then both the utility and the regulators will understand the right level of demand side resources vs. new generation.

In short, the utility's objective should be to pursue all DSM opportunities that offer the company and its customers more value than competing investments in generation and grid infrastructure. Crucial to that goal is a regulatory compact ensuring that the company and its customers both will always profit from utility investments that save electricity more cheaply than it could have been produced, and that these cost-effective investments are always more rewarding to the utility and to its customers than inferior alternatives. Indeed, this fundamental principle has the unanimous endorsement of the National Association of Regulatory Utility Commissioners.

For Hawaii, this means developing a new regulatory compact and providing the DCA and PUC with the resources needed to effectively regulate.