

EACP Committee

From: Wiig, Howard C <howard.c.wiig@hawaii.gov>
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To: EACP Committee
Subject: presentation to Council committee
Attachments: Maui County Council Energy Code v2 ay.pptx

For presentation to Environment, etc, committee tomorrow afternoon.

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Hawaii's 2015 Energy Code: The Next Big Step

Howard C. Wiig

Energy Analyst
Hawaii State Energy Office

The Environmental, Agricultural and Cultural
Preservation Committee, Maui County Council

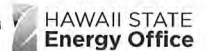
January 29, 2019



IEA Touts Energy Code Benefits

Energy codes are “...the single most important step (in tackling climate change) I want governments to take- and they can take it tomorrow”

Fatih Birol -- Executive, Director, International Energy Agency



Nobel Prize Winner Stephen Chu on Energy Codes

- Efficient buildings reduce America's fossil fuel use by as much as 33%.
- Efficiency is cheap--about \$12/barrel
- Efficiency offers more energy than solar, wind and nuclear combined.



State Government Leads the Way on Energy Codes

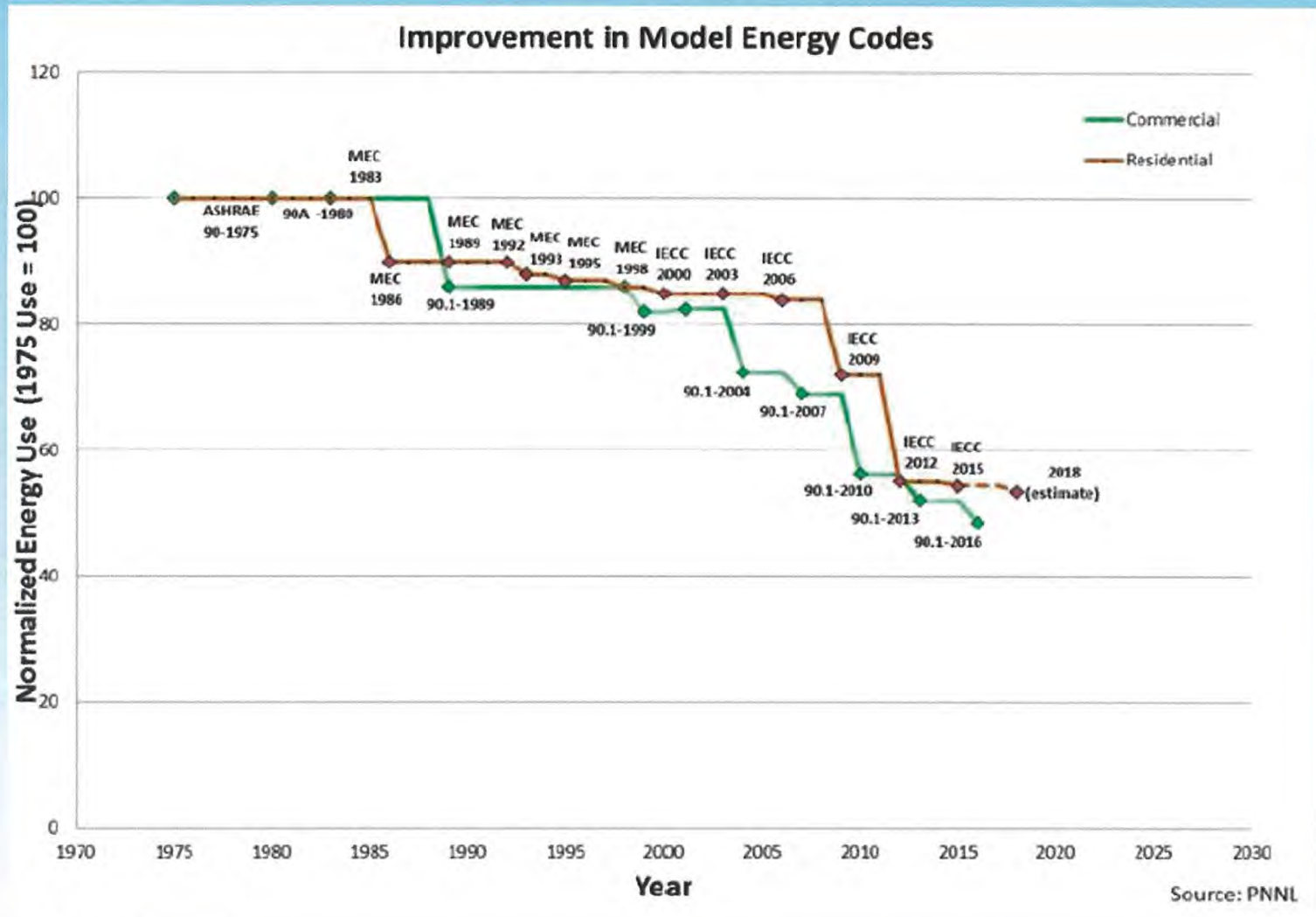


“We know that the greatest energy savings in residential electricity sector will come from reducing demand, increasing comfort and natural ventilation and eliminating electric water heaters. That’s why I approved the update to the international energy conservation code for the construction of state buildings because I always believe that leading by example is a good thing.”

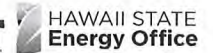
-- Governor David Ige



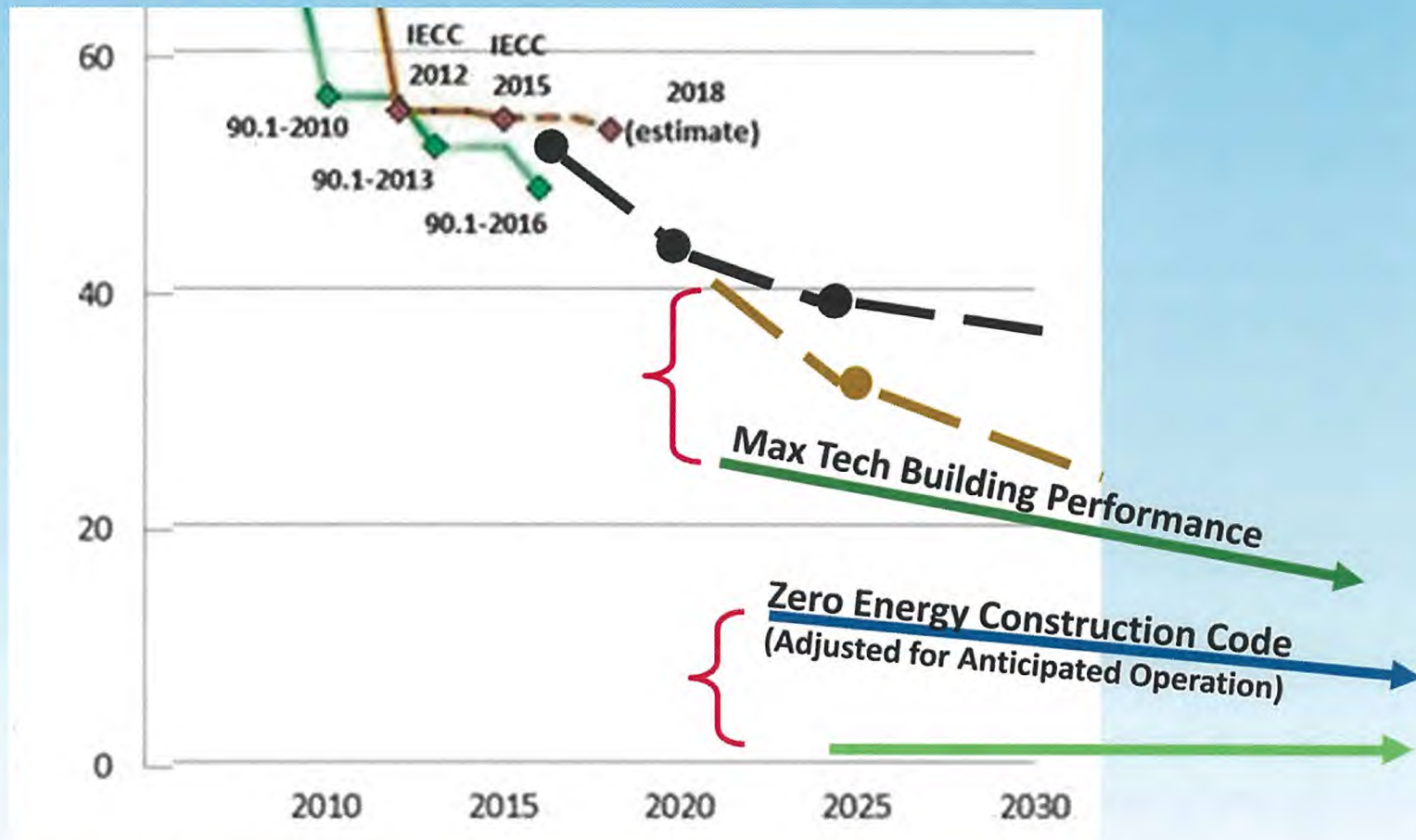
Energy Codes Boost Efficiency



New Building Institute



Code Progression to Zero



New Building Institute



DBEDT
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

HAWAII STATE
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IECC 2015: “The 50 Percent Solution”

- At national code hearings, IECC 2009, IECC 2012 and IECC 2015 goals were met
- IECC 2015 is 32% more efficient than IECC 2006
- The ideal tropical home will achieve a 48% reduction



Hawaii: 2006 IECC vs 2015

- The Hawaii Building Code Council (Council) was formed in 2007 and adopted 2006 IECC in 2008.
- Hawaii's IECC amendments have created a completely unique code
- Hawaii “leapfrogged” from 2006 IECC to 2015 IECC and added a Tropical Code



Changes in Commercial Code

Commercial Buildings

- Improved section on building commissioning
- Increased requirements for daylighting, lighting controls, and allowed lighting power densities.
- Allowed reroofing without adding new insulation if certain conditions are met.
- Sub-metering required for tenant spaces.



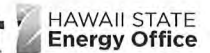
Changes in Residential Code

Residential Buildings

- The new Tropical Zone option provides section provides a path to high energy savings and reduced construction costs
- Minimum number of high-efficacy electrical lighting fixtures increased from 50% to 75%
- Minimum roofing insulation of R13 required
- Points option section added to increase compliance flexibility.

Cost Impacts

- Commercial Buildings - 33-40% energy savings over the 2006 Hawaii Energy Code (2014 study by Britt/Makela Group)
- Residential Buildings - Life-cycle cost savings of \$12,600 over the 2006 Hawaii Energy Code (2016 study for U.S. Department of Energy)



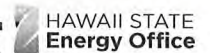
Hawaii's Tropical Zone Code -- Start from Scratch

- An option to 2015 IECC: Either production building path or tropical building path
- Emphasis on shading and minimizing interior space
- Projected low cost and low Energy Use Index

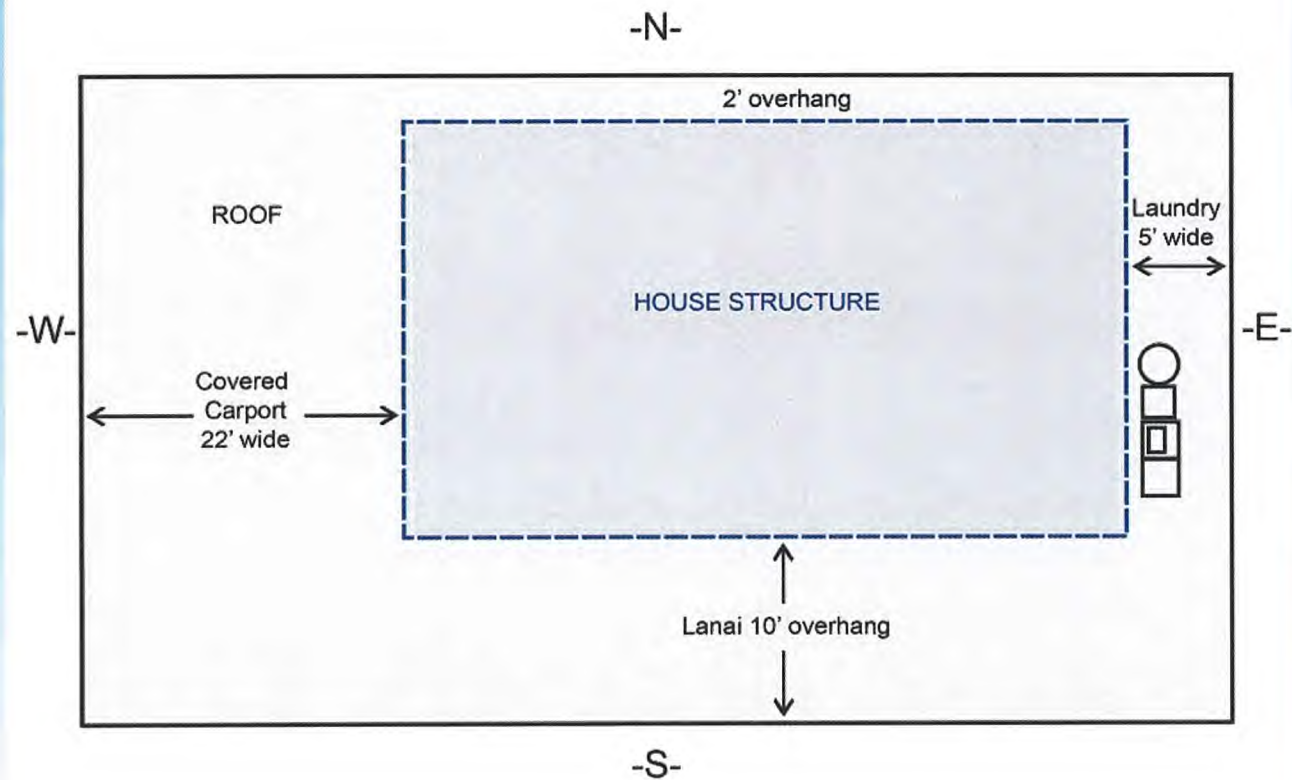


Tropical Ideal

- Smaller interior space
- Larger outdoor covered space
- Energy Star appliances, cable boxes and real time energy monitors
- Photovoltaics, solar hot water heating and attic fans
- Good cross ventilation and ceiling fans



Tropical Code Overhead View: Small Interior, Large Exterior

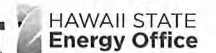


Jalousies are Integral to the Tropical Design



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Plantation-style Design is Suited to Hawaii's Climate



Striving for Net Zero

DEPARTMENT OF HAWAIIAN HOMELANDS KAUPUNI VILLAGE

Solar Heat Windows

Solar heat and infrared energy

Double-Paneled Air-Water Solar Panels

Produces power and pre-heats water for use

Clear Acrylic Solar Collector Material

High-Alt. Roofing

Reduces and minimizes roof absorption through the roof

Perforated Concrete Driveway

Perforated concrete driveway designed to reduce and minimize roof surface and to be designed for the ground

High-Performance Coating

Reduces heat gain through roof and walls

Ultra-Thin Glass

Extremely thin glass through roof

Insulated Roof

Reduces heat gain through roof and minimizes roof loss

High-Efficiency Windows

High-efficiency windows for the building

Low-Energy Building

Building is designed to be energy efficient and use the lowest possible energy for the building

Insulated Concrete Wall

Insulated concrete wall through the roof and walls



NET ZERO ENERGY

Location: Honolulu, Hawaii, USA

Kaupuni Village is a new development in a net zero energy community, applying the sustainable design strategies of Passive House and Beyond. This design includes the energy efficient appliances and lighting package, and a central energy hub used to monitor and manage energy production and utilization. These affordable houses will also be constructed with recycled materials ranging from gypsum and steel to concrete and other materials such as stone and brick. The development also includes a car off the grid community, where the power is produced by the community, and the power is used to power the homes, and the power is used to power the homes, and the power is used to power the homes.



group@hawaii.com



Affordable?

- No air conditioning
- Reduced wall insulation when shaded
- No SHGC requirements when shaded
- No enclosed garage
- Small interior, large shaded exterior



Mahalo

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