

CLIMATE CHANGE COMMISSION
CITY AND COUNTY OF HONOLULU

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VICTORIA KEENER, PH.D.
BETTINA MEHNERT, FAIA, LEED AP O+M

Climate Change Commission
Tuesday, October 16, 2018
Mayor's Conference Room, 3rd Floor
Honolulu Hale
530 South King Street
Honolulu, HI 96813
Meeting Minutes

Members present: Rosie Alegado, Makena Coffman, Charles Fletcher, Victoria Keener, and Bettina Mehnert.

Members Absent: None.

Public: Executive Director Josh Stanbro, Rocky Mould, Matthew Gonser, Uyen Vong, Hayley Cook (Office of Climate Change, Sustainability and Resiliency); Courtney Sue-Ako (Corporation Counsel); Anthony Aalto; Ken Lowry; Dave Raney; Michael Hamnelt; Teresa Dawson; Gary Chock; John M. Friedel; Holly Morgan; Joshua Ferrer-Lozano; Gail Suzuki-Jones; and Nick Henner.

Call to order: Chair Makena Coffman called the meeting to order at 3:07 p.m.

Roll Call: All five commissioners were present. Quorum was established.

Approval of the Meeting Minutes of September 18, 2018: The minutes were adopted as amended (**AYE:** Coffman, Fletcher, Keener, Mehnert; **NAY:** None; **ABSTAIN:** None.)

- Page 4, "heave" should be "heat".

Report on the Activities of the Office of Climate Change, Sustainability and Resiliency (CCSR):

Executive Director Josh Stanbro presented the following report:

- CCSR is doing public outreach on a climate action plan as part of Honolulu's commitment to the Paris climate agreement with 10 public meetings around the island. CCSR has developed a game for public to play that helps prioritize how they would like to see a transition to a carbon free economy. This is the first phase of the Climate Action Plan, which will be followed by technical help to form politics and projects that should be adopted when the plan is released next year.
- The Mayor has committed to planting 100,000 trees by 2025 and maintaining canopy cover at 35%, and CCSR has developed a web-based application to be unveiled on Arbor Day to track where trees are being planted on island, including all plantings, not just City efforts.
- Moody's reached back out to the City and asked specifically whether Honolulu has a hazard mitigation plan that deals with climate change. Moody's also asked if the City has a climate action plan (being developed now) and a sustainability plan, which the City does not have, but CCSR is developing the City's Resilience Strategy. Moody's also asked what projects are in the capital budget that will potentially deal with climate issues.
- At the federal level, the Disaster Recovery Reform Act was passed by the Senate amending the

FEMA Stafford Act, which will increase the amounts available for mitigation efforts as opposed to payouts on the back ends of disasters. Stanbro believes this is an immediate reflection of the number of disasters, tripling since the 1980s, and their links to climate change.

- CCSR will be hiring a position in the office specifically focused on hazard mitigation and building a long-term recovery strategy.

Questions and comments that followed:

- Alegado asked Stanbro to provide more detail on the demographics of those attending the public outreach meetings, noting the importance of including underrepresented groups. Stanbro responded that every councilmember has agreed to co-host at least one meeting and are reaching out to their local constituents to participate, and noted that CCSR would be interested in following up on any suggestions of groups or networks to reach out to.
- Mehnert asked if CCSR has reached out to schools. Stanbro responded CCSR has done some outreach with schools and immediately following the meeting in Pearl City, the councilmember's staff asked CCSR to outreach with Farrington High School.
- Coffman asked what route the Moody's request come through and what other conversation it has spurred within the City. Stanbro responded that it came through the Department of Budget and Fiscal Services (BFS) and then was distributed to several departments who have projects relating to the request. Stanbro does not believe there have been other conversations and noted that he asked the deputy of BFS to share if there is an aggregation of different cities' responses that Moody's shares back with the City.
- Keener asked if Moody's evaluates existing building codes. Stanbro responded that the request did not ask for that information.
- Fletcher asked if the Commission can get a copy of the response sent back to Moody's. Stanbro responded that he will check.
- Fletcher mentioned Camilo Mora's 100 million trees project and noted it as a good fit for collaboration on urban forestry goals.
- Alegado asked where the trees for the 100,000 trees commitment are coming from. Gonser responded that in terms of what trees get installed and what is grown in the nurseries, the Division of Urban Forestry continuously refines their preferred tree list and coordinates with the Department of Permitting and Planning who are regulating and permitting what can be planted. Gonser noted that it often depends on what is available in nursery and the kinds of requests that agencies make.
- Gonser also clarified that for maintaining tree canopy in the urban area, the urban area is not defined solely as urban Honolulu, but anywhere people live. Coffman asked to what extent equity in coverage is being considered. Gonser responded that the City would like to update the 2013 urban canopy assessment and the findings should inform prioritization of plantings through a more comprehensive urban forest master plan.
- Fletcher asked if the Stafford Act been signed into law. Stanbro responded not yet.
- Fletcher asked if the new position in hazard mitigation had been approved and what skill set CCSR is looking for. Stanbro responded that the position is approved but awaiting funding, and CCSR is looking for someone with experience with FEMA funding, long-term recovery plans, disaster mitigation and recovery, and grant writing and management.

Presentation on Making Building Codes More Resilient By Gary Chock, President of Martin & Chock, Inc:

- Chock presented on the results of a study completed last year, funded by the State Office of Planning to comprehensively look at what codes and regulations related to building construction might be adapted or revised in the future to adjust to climate change effects. The Department of Planning and Permitting was one of the primary advisory stakeholders for the study.
- Chock shared comments from stakeholders during the study: "We're living in the past. We're not even in the present in terms of what we use, so how are we going to deal with the future?"
- Chock noted that Hawaii and Texas are the states that use the oldest building codes across the

country, and even U.S. territories have adopted building codes that are more modern than Hawai'i's.

- The study included a modeling of coastal inundation based on future climatology of hurricanes in the Central Pacific and sea level rise to look at the difference between the present and the future in terms of storm inundation from a probabilistic standpoint.
- The overall recommendation from the study was to think about adaptive design, designing to the most probable, but not the worst case climate conditions, and incorporate flexibility in design to so as information improves in the future, renovations or improvements can be made to facilities. Chock noted that making these changes incrementally starting now will spread the cost out over time.
- Chock presented specific changes that can be implemented soon, if not now, at the City level: (1) Improve power transmission and distribution system resilience to high wind using modern code; (2) Address rainfall intensification in the building code and require flood elevations that include relative sea level change. This could also include consideration of 50 years of shoreline erosion with respect to site planning and foundation design; (3) Require the placement of critical equipment (necessary for the function of important facilities during and after a disaster) to be raised above the 500 year flood elevation; (4) Start to accommodate long term shoreline erosion coastal construction setbacks, which is controversial for residents in shallow lots that may not be able to rebuild. Chock noted this would need a peer-reviewed regulatory map to be updated about every 15 years; and (5) Make a change to the Revised Ordinance of Honolulu Chapter 25, Special Management Area (SMA) to create a coastal construction zone as a subset of the SMA zone where permits would have to explain how that development would enable adaptation to sea level rise and shoreline retreat.
- Chock presented the modeling done with Kerry Emanuel of MIT and Kwok Fai Cheung of UH SOEST to look at future coastal flooding zones. A probabilistic hurricane catalog was created representative of end of the century climate with sophisticated inundation modeling to look at what flooding would exhibit in the Waikīkī/Kaka'ako area. The resulting scenario maps show flooding that includes both end of century storm intensification and sea level rise, but models don't account for the possibility of favorable wind shear to degrade storms. Chock noted that there is a certain bit of favorable conditions is not baked into what we design to.
- Chock noted that the effect of climate change and sea level rise increases future expected flooding losses in Waikīkī to Kaka'ako by almost 500%.
- The models show how principle flooding occurs out from the Ala Wai, where the canal is a weak point in the system. Chock noted that there are thousands of properties that could be spared from flooding if there's some flood control measure for the Ala Wai. Chock mentioned the Army Corps of Engineers plan to raise the levee height along the Ala Wai and believes if it is embraced it can create a nice public space.
- Chock noted that for the urban core, it appears that government should be working towards some measure of coastal defense because no defense means other thousands of properties become unviable. He suggested there is not much the individual property owner can do versus what the city or state could do.
- Chock noted that city and state government should plan to achieve some measure of adaptation for key facilities such as Pier 1 Honolulu Harbor, the airport reef runway, Sand Island Access, Ala Wai flood control, and Waikīkī.
- Chock noted it would also be useful to look at how to adjust stormwater standards in the face of rainfall intensification. Chock noted that many flooded structures were built to standards before the implementation of flood insurance requirements and these communities will be more susceptible.
- Chock recommended adopting a fiscally low-regret adaptive strategy that requires facilities to plan for flexibility to accommodate future changes.

Questions and comments that followed:

- Chock clarified the limitations of the scope of the study and models. Chock noted that models did not take into account inundation up through man holes or rainfall, only coastal inundation (storm

- surge). Chock noted that consideration of revenue sources was beyond the scope of the study.
- Chock clarified that the model used 0.6m of sea level rise and 0.33m of mean high water.
 - Fletcher asked Chock to clarify if the recommended approach to adapt in place rather than retreat. Chock responded that there are certain key resources to defend and there may be other places where you retreat, but the key is protecting the economic assets of the City.
 - Fletcher asked where the landfall of the eye was in the 500-year hurricane scenario and the category of the hurricane. Chock responded it was a category four and not the worst case scenario, but a direct hit.
 - Mehnert noted that the Land Use Ordinance (LUO) is currently going through an update and asked Chock if he is involved in the update. Chock responded that the LUO is not part of the report but is open to opportunities to be involved.
 - Fletcher asked Chock if a cost assessment was done for coastal defense. Chock responded no and noted the need for a group to study this. Chock noted that the Netherlands have accomplished large flood control projects in the past 50-60 years that were expensive but not out of reach, on the order of \$150 million.
 - Mehnert clarified that the current code requires windows designed only to 110mph and asked what standards Chock would recommend designing windows to. Chock responded that the analysis of the simulated storm showed some intensification but found that the delta in the windspeed was not sufficient to make a change right now. But Chock noted that single family homes require different consideration than critical facilities.
 - Coffman asked Chock to talk about how the hazard mitigation plan update is going to incorporate climate change. Chock responded that plan will have a dedicated section devoted to climate change and will tie into the other hazards it affects. Chock noted that it will be the first hazard mitigation plan in Hawaii that does that specifically.
 - Keener asked Chock if he knew of any other states or cities where the building codes have incorporated the recommendations he presented. Chock responded he is not aware of any and that a lot of movement has happened with respect to reducing carbon footprint but not so much in design and construction in terms of designing for anticipated future effects.
 - Mehnert asked if the State Building Code Council is still comprised of volunteers and if it should be made a paid effort to move recommendations forward. Chock responded that many of the recommendations have a road of implementation that passes through the State Building Code Council but not all. Chock noted that what is needed is more proactive support from the state.
 - Rocky Mould asked if HECO's current updates to transmission and distribution lines goes beyond the current code requirements. Chock responded that he suspects it does not.
 - Mould asked if Chock knew of any literature on low-regrets versus no-regrets types of planning investments. Chock responded no and clarified that he uses the term "low-regret" in the context of making sure you're not overspending and getting a quantifiable good in the financial return of investment. Chock noted that others have used the term in different contexts.
 - Anthony Aalto asked if, considering the Commission's recommendations of 3.2 feet of sea level rise by the end of the century and the 4th National Climate Assessment's recommendation of up to 8 feet, Chock's models using about 2 feet of sea level rise be considered a low threshold. Chock responded that the scenarios we should plan for could be much greater eventually, but in the context of design and construction, the recommendations are given in the context of a process that continues to be updated as time goes on and information is gained.

Presentation on Climate Implications on the Tropical Energy Code by Howard Wiig, Energy Analyst, Hawai'i State Energy Office, Department of Business, Economic Development, and Tourism:

- Coffman introduced Howard Wiig as the Chair of the State Building Code Council and an energy analyst at the Hawai'i State Energy Office.
- Wiig noted that energy codes are the single most important step in tackling climate change because they work to dramatically reduce fossil fuel use for electricity to power homes and buildings, and less fossil fuel burning means less greenhouse gas.

- Wiig noted that the function of the energy code is to render the home or building as energy efficient as possible in a costly manner while maintaining health and safety.
- Wiig noted that the state code uses the 2015 IECC, but the counties still use the code from 2006.
- Wiig noted that energy use can be reduced by 33% with changes to the energy code and the resulting savings are exponential. Wiig noted that the new building code can save Hawai'i \$1.4 billion in energy costs over 20 years.
- Wiig noted the energy code is a combination of energy efficiency and renewable energy. At the last State Building Code Council meeting, the 2017 National Electrical Code was adopted, which includes four provisions dealing with energy storage, making the approval of applications for storage easier, and storage will help shave the evening peak demand for electricity.
- Wiig presented future projections where combining efficiency with renewable energies pushes the whole state close to zero net energy.
- Wiig noted that the American Council for an Energy-Efficient Economy (ACEEE) ranked Hawai'i as the 6th top state on energy efficiency policies and programs. Wiig believes when the new energy code is passed, Hawai'i will jump to 5th. Ahead of Hawai'i is California, Massachusetts, Rhode Island, Connecticut, and New York.
- Wiig shared the changes being made to the code for commercial buildings: (1) Improved section on building commissioning. Wiig noted an energy savings of 15-20% on a commissioned versus non-commissioned building; (2) Increased controls for daylighting (when fixtures measure daylight and automatically go off when there is adequate natural lighting) and reducing lighting power density (number of watts allowed per square foot in a given space); (3) Allowing reroofing without adding new insulation if certain conditions are met with options such as irradiant barriers and reflective roofs in Kaua'i, Honolulu, and Maui; and (4) Sub-metering required for tenant spaces.
- Wiig shared the changes being made to the code for residential buildings: (1) Increased high efficacy lighting, namely LEDs; (2) Requirement of less floor insulation; and (3) Mandatory ceiling fans, which, at high speeds, can reduce perceived body temperature by 12 degrees.
- Wiig noted that the code also requires mandatory reflective roofs for new construction for commercial and residential when appropriate. Wiig shared that he is a big proponent of titanium dioxide, which is a key element of reflective coatings as its tiny particles mixed with an existing roof coating or paint lightens the surface of the paint almost indiscernibly and reflects back radiant heat through the coating and into the atmosphere.
- Wiig noted an accomplishment of the 2015 International Energy Conservation Code (IECC) was the establishment of a new climate zone called the tropical climate zone. Wiig noted this provided carte blanche to design and put into the code Hawai'i's "tropical home". The ideal tropical home is encouraged by the code to have a small interior space and larger exterior space, i.e., lanais and overhangs for washer and dryers. Tropical code homes would have energy star appliances, solar water heating, good cross ventilation, and encourage the use of jalousies. Wiig noted that these types of houses are being built on the Big Island and look like plantation houses.
- Wiig noted the Kapuni development in Wai'anae incorporates the elements of the tropical code, including solar photovoltaic (PV), and are virtually zero net energy. Wiig noted that as a development with different families, some achieved zero net energy and others were large energy consumers, just depending on lifestyles.

Questions or comments that followed:

- Fletcher asked if reflective roofs can be done on any pitch. Wiig responded that a flat roof is defined as a one in twelve pitch. Keener asked why residential rates are against white roofs. Wiig responded that residential roofs are generally steep and can be seen from the road.
- Mehnert asked how far the state is from a net zero mandate for government buildings or institutions like universities. Wiig responded that by 2024 residential buildings especially will be close to zero net energy. Wiig noted that at the IECC national committee meeting early next year, many will be proposing a major leap towards zero net energy. Coffman also noted that the University of Hawai'i has a zero net energy mandate for 2035.
- Mehnert asked if there is a connection to energy storage in residences and electric vehicles. Wiig

responded yes, and noted that battery technology is getting better and cheaper. Wiig noted that the code will mandate a conduit for EV charging stations for new commercial and residential constructions, as it is cheaper to install during the time of construction.

- Fletcher commented that there is a collision where air temperatures are getting warmer—causing health implications especially during major El Niño's—and the energy efficiency trends emphasize more reliance on natural ventilation and less air conditioning. Wiig responded that a solution is ceiling fans at high speeds. Fletcher believes that fans are not sufficient to counteract the potentially deadly effects of really hot conditions on people who have medical problems. Wiig noted that in the tropical code, you can AC up to 50% of your interior square footage.
- Fletcher commented that periods of high temperatures can cause blackouts. Alegado commented that with a higher penetration of PV, individual houses won't have trouble with blackouts, if accompanied by a battery. Wiig noted that HECO will not approve new PV installation unless accompanied by storage.

Discussion on Developing a White Paper on Topics of Climate Change and Risk:

- Coffman proposed making the next Commission meeting a working meeting for writing the white paper.
- Keener noted that she will be doing research on what other cities are doing in terms of risk management and can start a literature review.
- Coffman suggested the paper could elaborate on two sides of the issue of climate change and risk: (1) hazards risk, in which the building codes and LUO interplay with things like insurance markets; and (2) ratings risk, where bond ratings may be reflective of the hazards risk.
- Coffman suggested working with CCSR to pull together data the City has and use the paper as a grounding for the current baseline.

Public Input for Matters Not on the Agenda: None.

Next Meeting: The next Climate Change Commission meeting is tentatively scheduled for Tuesday, November 13, 2018 from 3:00PM – 5:00PM.

Announcements:

- Fletcher noted that some edits were made to the Sea Level Guidance, resulting in a change of communication but not content. Fletcher noted that CCSR will put a special website on the Commission page where anyone can go directly to find the white papers.
- Coffman announced that she will be meeting in New York with Guy Carpenter's analytics team, and can follow up on any questions the Commission may have for them.
- Coffman announced that the State Climate Commission sent a letter to the mayor, complimenting the directive and the Commission's work on the Sea Level Rise Guidance, with intentions to continue the work at the state level.

Adjournment: The meeting was adjourned at 5:10 p.m.