

Climate Change Commission

CITY AND COUNTY OF HONOLULU

925 Dillingham Boulevard, Suite 257 • Honolulu, Hawai'i 96817

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MEETING AGENDA

Tuesday, July 2, 2019

3:00 p.m.

Mission Memorial Building, 1st Floor Hearings Room
550 South King Street
Honolulu, Hawai'i 96813

1. Call to Order
2. Roll Call
3. Approval of the Minutes: May 28, 2019
4. Rules of Practice and Procedure of the Climate Change Commission
5. Report on Activities of the Office of Climate Change, Sustainability and Resiliency
6. Testimony received from Dr. Paul Bernstein in follow up on the carbon fee discussion at the May 28, 2019 Climate Change Commission meeting
7. Bill 25 (2019), Relating to the Adoption of the State Energy Conservation Code – Editing and approval of testimony for submission to the City Council
The purpose of Bill 25 (2019) is to regulate the design and construction of residential and commercial buildings for the effective use of energy through the adoption of the State Energy Conservation Code (2017), subject to the local amendments herein.
8. Public Input for Matters Not on the Agenda
9. Tentative Next Meeting Date
10. Announcements
11. Adjournment

A mailing list is maintained for interested persons and agencies to receive this commission's agenda and minutes. Additions, corrections, and deletions to the mailing list may be directed to the Office of Climate Change, Sustainability and Resiliency (CCSR) at Kapālama Hale, Suite 257, 925 Dillingham Boulevard, Honolulu, Hawai'i 96817; Telephone: (808) 768-2277 Fax: (808) 768-4242. Agendas and minutes are also available online at www.resilientoahu.org.

If you require special assistance, auxiliary aid and/or service to participate in this event (i.e., sign language interpreter, interpreter for language other than English, or wheelchair accessibility), please contact CCSR at (808) 768-2277 or email your request to ccc@honolulu.gov at least three (3) business days prior to the meeting.

All written testimony must be received by CCSR 48 hours prior to the meeting. If within 48 hours, written and/or oral testimony may be submitted directly to the Commission at the meeting. Send to: Climate Change Commission, Kapālama Hale, Suite 257, 925 Dillingham Boulevard, Honolulu, Hawai'i 96817. Fax: (808) 768-4242. Email: ccc@honolulu.gov.

June 6, 2019

Climate Change Commission
Submitted electronically to:
Makena Coffman
Chip Fletcher
Uyen Vong

Dear Commission Members:

In this follow up testimony, I am attempting to accomplish two goals: 1) expand on answers that I gave to questions that arose at the May Climate Commission Meeting; and 2) address, what I believe are, errors in Henry Curtis's testimony specifically on the topic pricing carbon (e.g., carbon tax or fee) and the distribution of these revenues.

I am summarizing the main points and attaching X short write-ups on the efficacy of a carbon fee and dividend policy. When it comes to addressing carbon emissions in a market based method, most economists believe that placing a price on carbon is the most effective policy because it directly addresses the problem (i.e., the emissions of carbon). When regulators place a price on carbon, they then have an entirely separate decision of what to do with the revenues that are generated from the fees people pay to emit carbon. They can disperse the revenues in many ways. The following are the most common proposals:

- Refund to households or citizens
- Refund to individuals by reducing income and/or sales taxes
- Refund to businesses by reducing corporate income taxes
- Invest in renewable and/or less carbon-intensive technology
- Pay for infrastructure needed to address climate change
- Place in the general fund to be used for whatever government feels is most needed

The Commission raised concerns about the equity of a carbon tax, specifically the potential for a carbon tax to be regressive. The *Household Impacts for Hawaii.pdf* file explains how a carbon fee and dividend would be progressive if the carbon revenues were returned to households (same applies if returned to citizens). Though this piece fails to fully account for all the specifics of Hawaii residents (e.g., difference in transportation cost of goods to Hawaii vs. the national average and Hawaii's energy usage patterns because of virtually no heating and shorter commuting and driving distances), its results are, however, consistent with economic studies that find the poorest quintiles receive more money in dividends than they pay in fees while the wealthiest quintiles pay more than they receive. Therefore, these results are likely qualitatively correct, but further analysis is needed to arrive at more accurate numbers.

Remember these figures are representing averages so as the Commission astutely stated, there could be low income Hawaii residents who will fare worse, but on average the lower quintiles would benefit.

In his testimony, Henry Curtis claimed that a carbon tax was a bad policy. He stated that a carbon tax is a bad way to force people to reduce their emissions. The attached file, *carbon-taxes-can-do-the-job-economics-policy-network.pdf*, explains why Mr. Curtis's comments are incorrect. This short piece briefly discusses the actual trajectory of emissions in three jurisdictions that have imposed carbon

taxes. The examples discussed represent some of the few jurisdictions that have levied *relatively high tax levels* on fossil fuels, *covering major sectors* of their economies, for a period of at least several years. I mentioned this paper in my testimony, but at the time, I couldn't recall the three jurisdictions when Dr. Fletcher asked me. This paper answers Dr. Fletcher's question.

Dr. Keener asked me about the major uncertainties surrounding the greenhouse gas estimates that I provided. I mentioned a couple key uncertainties. Below I provide a more complete listing of the major uncertainties:

- GDP growth
- Oil prices
- Behavioral responses (elasticities)
- Penetration of technology
- Technology development

Thank you for accepting my follow-up testimony. Please let me know if you have further questions.

Kind Regards,

Paul Bernstein, PhD.

Can Carbon Taxes Do the Job?

By Jonathan Marshall, [CCL Economics Policy Member](#)

April 2019

Summary: *Taxes on fossil fuels will not achieve miracles if they are capped too low or restricted to a few industries. However, the well-studied experiences of the U.K., British Columbia, and Sweden prove that carbon taxes not only can but do have powerful impacts on greenhouse gas emissions when set reasonably high and given broad coverage. With its steadily rising fee levels and application to virtually the entire economy, the Energy Innovation and Carbon Dividend Act should slash U.S. greenhouse gas emissions even more dramatically than these examples, justifying political action to make it a centerpiece of national climate policy.*

More than 3,500 economists, including more than two dozen Nobel laureates, have signed a [statement](#) calling for “immediate national action” to address global climate change and declaring that “a carbon tax offers the most cost-effective lever to reduce carbon emissions at the scale and speed that is necessary.” The formula they propose—a “robust and gradually rising carbon tax” to harness the “invisible hand of the marketplace to steer economic actors towards a low-carbon future,” combined with equal lump-sum rebates of the revenue to every individual—is embodied in H. R. 763, the Energy Innovation and Carbon Dividend Act. It would levy an initial tax of \$15 per ton of carbon dioxide on fossil fuel providers, rising every year by \$10 a ton until emissions have been reduced 90 percent below 2016 levels. It would also tax emissions of other greenhouse gases commonly used as refrigerants.

How can economists and other experts be so confident in the ability of such taxes to slash greenhouse gas emissions? The answer, in a word, is experience.

The first kind of experience relates to the observed way that people for thousands of years have reacted to changes in prices. Simply put, purchases of most goods, most of the time, fall when their prices go up relative to possible substitutes. In market economies, producers adjust to follow (or even anticipate) such shifts in consumption. Based on millions of historical data points in hundreds of industries, economists have built models to predict how quantities of goods and services will react to policy changes. *The best current economic models all agree that raising taxes on fossil fuels, while returning revenues to individuals by various means, will powerfully cut consumption of these climate-disrupting sources of energy.* For example, a fee of \$50 per ton of CO₂, rising at 5% per year, could slash greenhouse gas emissions more than 40% below 2005 levels by 2030, according to the Stanford Energy Modeling Forum.¹ The bipartisan Energy Innovation and Carbon Dividend Act, with its lower starting point (\$15/ton) but steeper ramp (\$10/year), would likely slash emissions *at least* as much.²

Real-world experience with carbon taxes

If you don’t trust the models, consider the second kind of experience: the actual trajectory of emissions in several jurisdictions that have imposed carbon taxes. The examples discussed here represent some of the few jurisdictions that have levied *relatively high tax levels* on fossil fuels, *covering major sectors* of their economies, for a period of at least several years.³

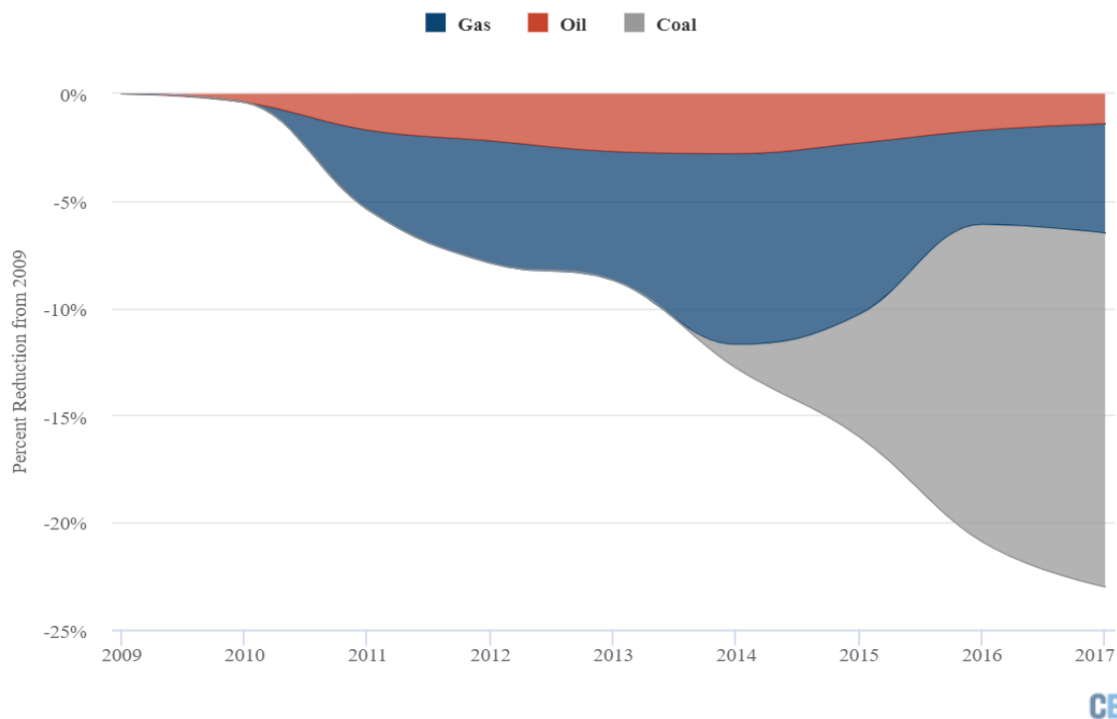
1. United Kingdom

In 2001, the UK imposed a Climate Change Levy on fossil fuel use by some manufacturing plants, ranging from £16 to £30 per ton of carbon. *Affected plants cut their electricity use by an average of 23 percent.*⁴

In 2013, the UK introduced a broader [Carbon Price Floor](#) on fossil fuels at a rate of about \$23/ton of carbon dioxide-equivalent (tCO₂e). Although it covers only 23 percent of emissions, by 2017 the UK's total CO₂ emissions were *38 percent below 1990 levels* and as low as emissions were back in 1890.⁵

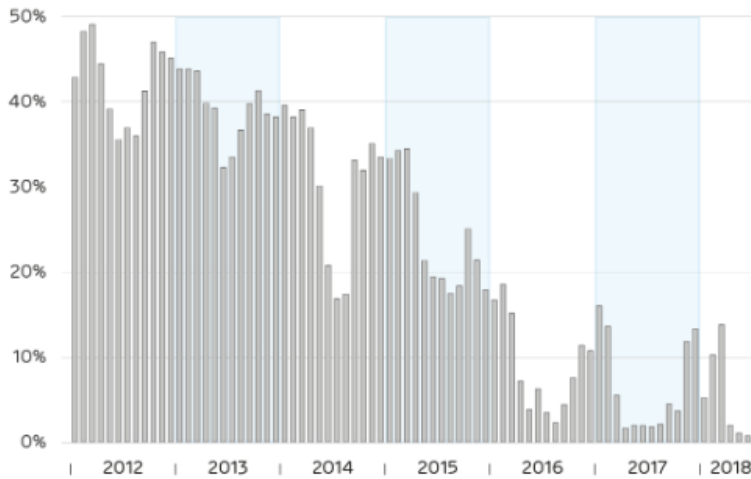
- *Electricity generation from coal fell by four-fifths from 2012, before the tax was imposed, to 2016.*⁶ See graph below.
- A 2018 report by academics at Imperial College London and consultants from E4tech, declared, “The UK’s carbon price . . . has led to rapid deployment of renewables and the fastest phase out of coal power, making for world-leading progress in reducing the carbon emissions from power generation. . . Uptake of electric vehicles is also among the highest in the UK, which is home to the world’s 5th largest electric vehicle fleet.”⁷

Reductions in UK fossil fuel CO₂ by source



Source: <https://www.carbonbrief.org/analysis-uk-carbon-emissions-in-2017-fell-to-levels-last-seen-in-1890>

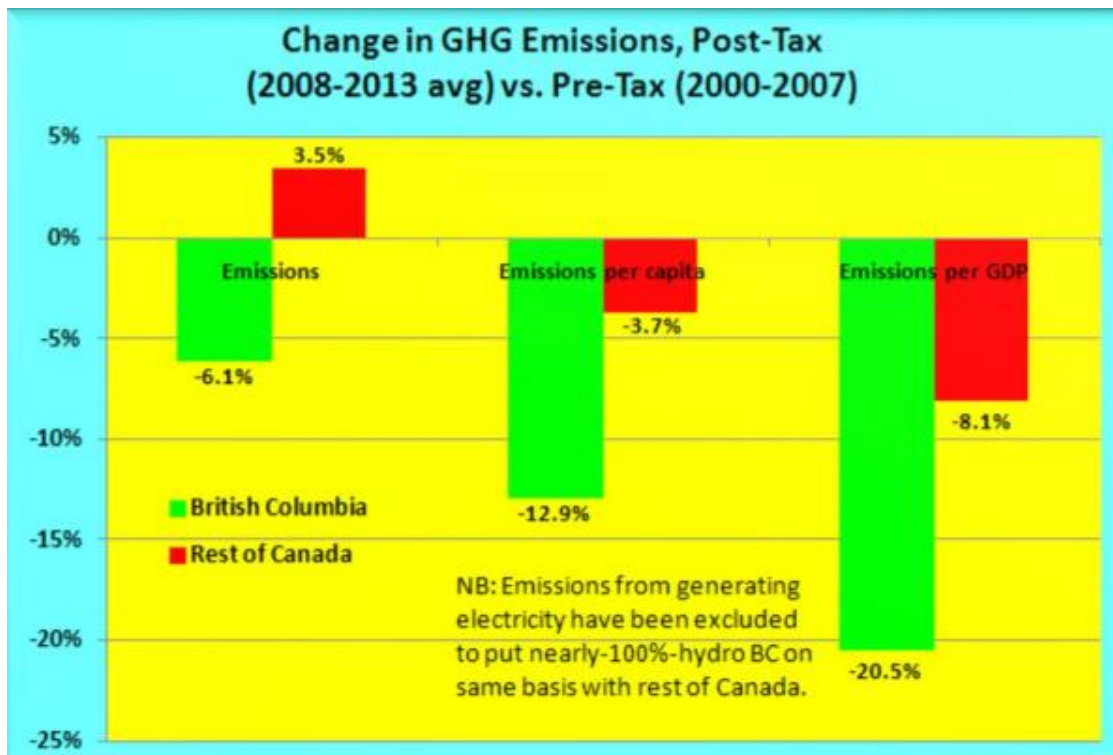
Share of generation from coal



Source: [Electric Insights Quarterly](#) - Q2 2018

2. British Columbia

The Canadian province of British Columbia introduced a tax on most fossil fuels, starting at C\$10/ton/CO₂ in 2008, and rising to C\$30 in 2012, where it remained until increasing again to C\$35 in 2018. Demand for petroleum fuels and commercial natural gas fell significantly. From 2008 to 2013, per capita CO₂ emissions declined as much as 15 percent, with no demonstrable reduction in the province’s economic performance.⁸



Source: Charles Komanoff, "[British Columbia’s Carbon Tax: By the Numbers](#)" December 17, 2015

3. Sweden

Sweden introduced a carbon tax in 1991, rising from €29 per ton over time to €137 per ton, the highest rate in the world. Even though the tax covers less than two-thirds of CO2 emissions sources, it has had a tremendous impact.⁹ In 2016, Swedish Minister of Finance Magdalena Andersson, said “We’ve had GDP growth of 60 percent, and at the same time, our emissions have been reduced by 25 percent. So, it shows that absolute decoupling is possible.”¹⁰

Most remarkably, to confirm her point, *Sweden now emits only a quarter as much CO2 per dollar of GDP as the United States.*¹¹ Its per capita GHG emissions are also about a third lower than the European Union average.¹²

US and Swedish economic growth

Other than during the early 1990s, growth in Sweden has generally resembled growth in the U.S. To meaningfully compare the performance of these two economies, which are of very different sizes, growth is expressed relative to how big they were in 1990.

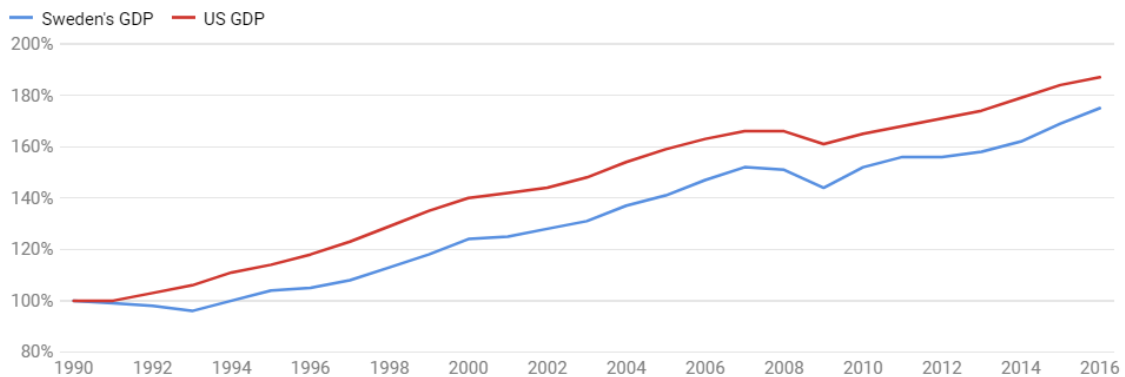


Chart: The Conversation, CC-BY-ND • Source: [World Bank](#) • [Get the data](#)

US and Swedish greenhouse gas emissions

Greenhouse gas emissions have declined by about 25 percent in the past three decades in Sweden, which taxes carbon. In the U.S., which doesn't tax carbon, emissions are declining but were higher in 2016 than in 1990.

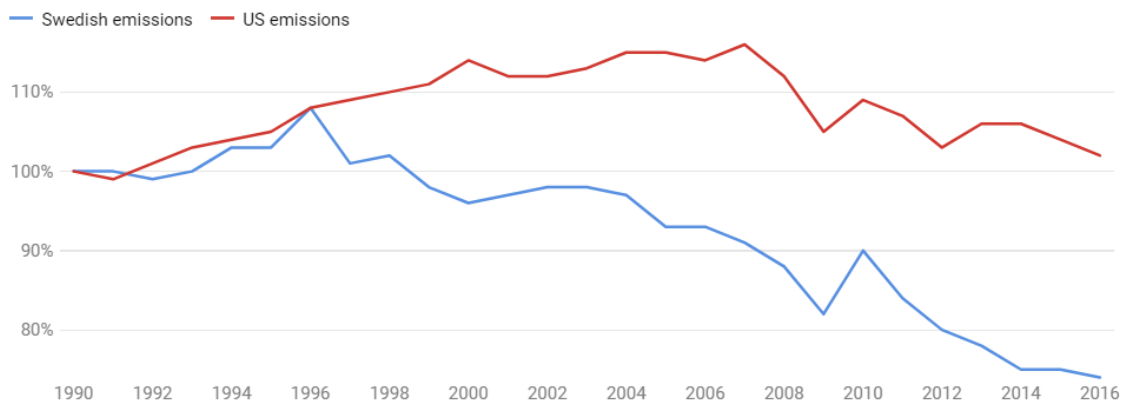
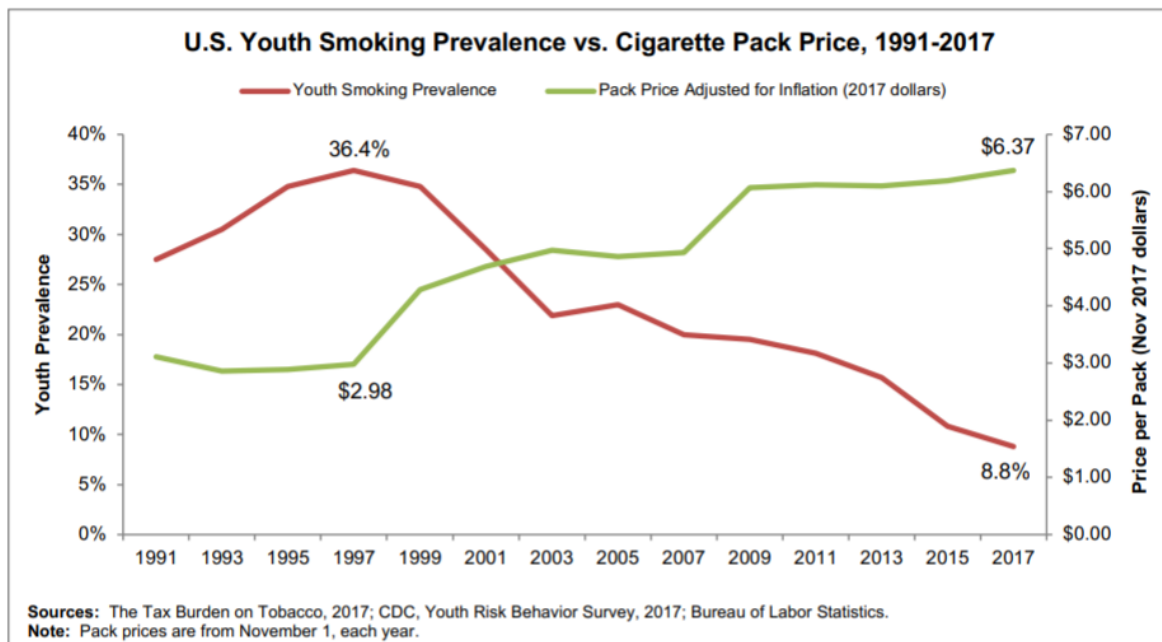


Chart: The Conversation, CC-BY-ND • Source: [Statistics Sweden and EPA](#) • [Get the data](#)

Source: <https://theconversation.com/with-the-right-guiding-principles-carbon-taxes-can-work-109328>

Experience with other taxes on behavior

Getting people to break their “addiction” to fossil fuels will be no easy task, whatever the policy tools, but consider the success of tobacco taxes in cutting smoking in the face of real substance addiction. The National Cancer Institute and World Health Organization concluded in 2016: “A substantial body of research, which has accumulated over many decades and from many countries, shows that significantly increasing the excise tax and price of tobacco products is the single most consistently effective tool for reducing tobacco use. Significant increases in tobacco taxes and prices reduce tobacco use by leading some current users to quit, preventing potential users from initiating use, and reducing consumption among current users.”¹³



Source: <https://www.tobaccofreekids.org/assets/factsheets/0146.pdf>

Conclusion

The well-studied experiences of the U.K., British Columbia, and Sweden prove that carbon taxes not only can but do have powerful impacts on greenhouse gas emissions when set reasonably high and applied broadly across sectors of the economy. With its steadily rising fee levels and coverage of virtually the entire economy, the Energy Innovation and Carbon Dividend Act should slash U.S. greenhouse gas emissions even more dramatically than these examples, justifying political action to make it a centerpiece of national climate policy.

Endnotes

¹ Alexander Barron, et al., "[Policy Insights from the EMF 32 Study on U.S. Carbon Tax Scenarios](#)," *Climate Change Economics*, Vol. 9, No. 1 (2018); Jonathan Marshall and Robert Archer, "[10 fast facts about revenue-neutral carbon fees](#)," CCL Economics Policy Network (2018).

² Noah Kaufman, "[How the Bipartisan Energy Innovation and Carbon Dividend Act Compares to Other Carbon Tax Proposals](#)," November 27, 2018.

³ As Tufts University economist Gilbert Metcalf recently observed, "The literature on the economic impacts of a carbon tax are somewhat thin, in part since few broad-based carbon taxes have been in place for a long enough time to assess." ("On the Economics of a Carbon Tax," February 24, 2019, prepared for Brookings Papers on Economic Activity Meeting, March 7-8, 2019.) For rundowns of the literature, see Goksin Bavbek, "[Carbon Taxation Policy Case Studies](#)," Centre for Economics and Foreign Policy Studies, October 2016; Steven Nadel, "[Learning from 19 Carbon Taxes: What Does the Evidence Show?](#)" American Council for an Energy-Efficient Economy," 2016; and Zheng Li and Junjing Zhao, "[Environmental Effects of Carbon Taxes: A Review and Case Study](#)," *World Journal of Social Science* 4:2 (2017), 7-11.

⁴ Ralf Martin, et al., "[The impact of a carbon tax on manufacturing: Evidence from microdata](#)," *Journal of Public Economics* 117 (September 2014), 1-14.

⁵ Zeke Hausfather, "[Analysis: UK carbon emissions in 2017 fell to levels last seen in 1890](#)," March 7, 2018.

⁶ Akshat Rathi, "[A Carbon Tax Killed Coal in the UK](#)," Quartz.com, February 1, 2018.

⁷ "[Energy Revolution: A Global Outlook](#)," December 2018; quote from [press release](#), December 5, 2018.

⁸ Brian C. Murray and Nicholas Rivers "[British Columbia Revenue Neutral Carbon Tax: A Review of the Latest 'Grand Experiment' in Environmental Policy](#)," Duke University, Nicholas Institute, Working Paper NI WP 15-04, May 2015; see also Charles Komanoff Charles and Matthew Gordon, "[British Columbia Carbon Tax: By the Numbers](#)," December 2015 and Robert Archer, "[British Columbia Revenue Neutral Carbon Tax: Lessons Learned for the U.S. and Beyond](#)," Citizens' Climate Lobby, October 2018.

⁹ Swedish Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, "[The Carbon Tax in Sweden](#)," September 3, 2018. Sweden's electricity sector, and two-thirds of its industrial sector (which accounts for 62 percent of all energy-related emissions) are covered not by the country's carbon tax but by the European Union's Emissions Trading System. Until 2018, carbon prices under the ETS typically fell below €10 per ton. Other important factors to note when assessing the impact of Sweden's carbon tax:

1) The impact of Sweden's carbon tax on transportation emissions was muted by the fact that Sweden already had very high fuel taxes of about 5.5 SEK/liter before 1991. Today the carbon tax amounts to about 7 SEK/liter, an increase of only 30 percent. (Julius J. Andersson, "[Cars, Carbon Taxes and CO2 Emissions](#)," March 2017, London School of Economics and Political Science, Figure 1.)

2) In 1990, [Sweden](#) generated almost all of its electricity from hydro and nuclear power, so there was essentially no room for improvement in CO2 emissions. In the [United States](#), by contrast, coal and natural gas account for more than 60 percent of electricity production.

¹⁰ Quoted in World Bank Group, "When It Comes to Emissions, Sweden Has Its Cake and Eats It Too," May 16, 2016, <http://www.worldbank.org/en/news/feature/2016/05/16/when-it-comes-to-emissions-sweden-has-its-cake-and-eats-it-too>. See also Swedish Federal Ministry for the Environment, "[The Carbon Tax in Sweden](#)," September 3, 2018; Julius J. Andersson, "[Cars, Carbon Taxes and CO2 Emissions](#)," March 2017, London School of Economics and Political Science.

¹¹ Sweden emits 0.08 kg versus 0.32 kg per \$US. World Bank, "[CO2 emissions \(kg per 2010 US\\$ of GDP\)](#)." Sweden also emits only about as quarter as much CO2 per capita (World Bank, "[CO2 emissions per capita – metric tons](#)").

¹² "[The Carbon Tax in Sweden](#)," 3-4.

¹³ NCI and WHO, [The Economics of Tobacco and Tobacco Control](#), 2016, 10-11.



Citizens' Climate Lobby

Financial Impact on Households of Carbon Fee and Dividend Local Impacts in Hawaii

Introduction

This study on the impact to households of Carbon Fee and Dividend was funded to respond to concerns expressed by members of Congress that constituents in their state would not benefit under our proposal. Key to the concerns expressed was not only understanding how the average constituent did, but how different groups of constituents fared. Concern for low-income constituents, for instance, is common for members of both parties.

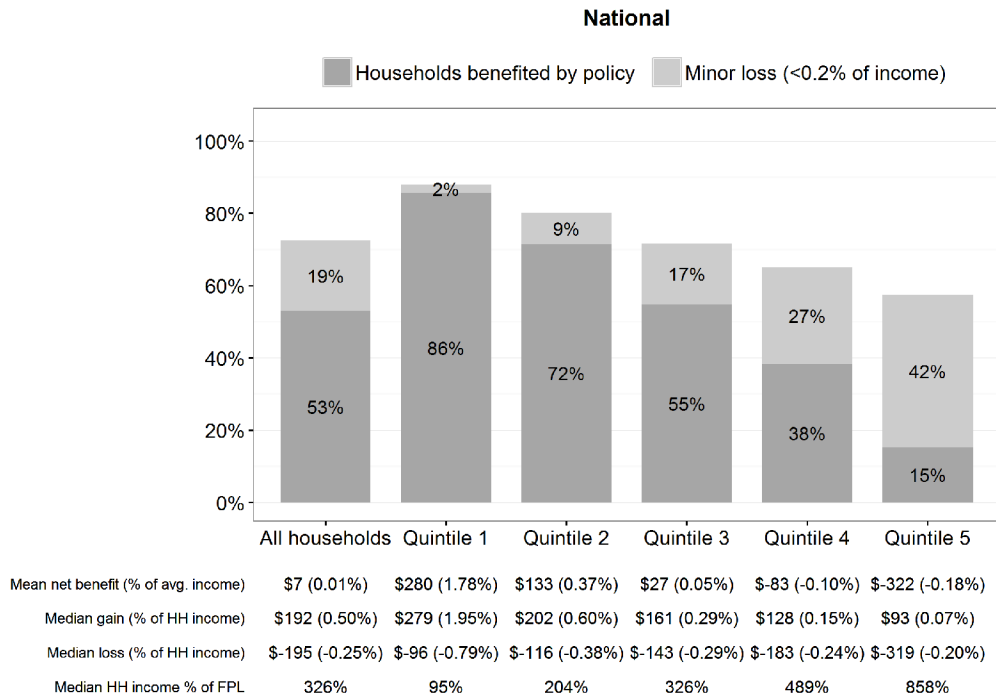


Figure 1: National Averages by Economic Quintile. Note that the three lowest-income quintiles show a benefit for the mean (average) household. The average net benefit for the lowest-income quintile is 1.78% of income, whereas households in the top quintile experience, on average, net losses that are a much smaller percentage of their total income, at just 0.18%.

All data is from the 2016 working paper, “Impact of CCL’s proposed carbon fee and dividend policy: A high-resolution analysis of the financial effect on U.S. households” by Kevin Ummel, Research Scholar, Energy Program, International Institute for Applied Systems Analysis (IIASA).

Current working paper and summary available at <http://citizensclimatelobby.org/household-impact/>

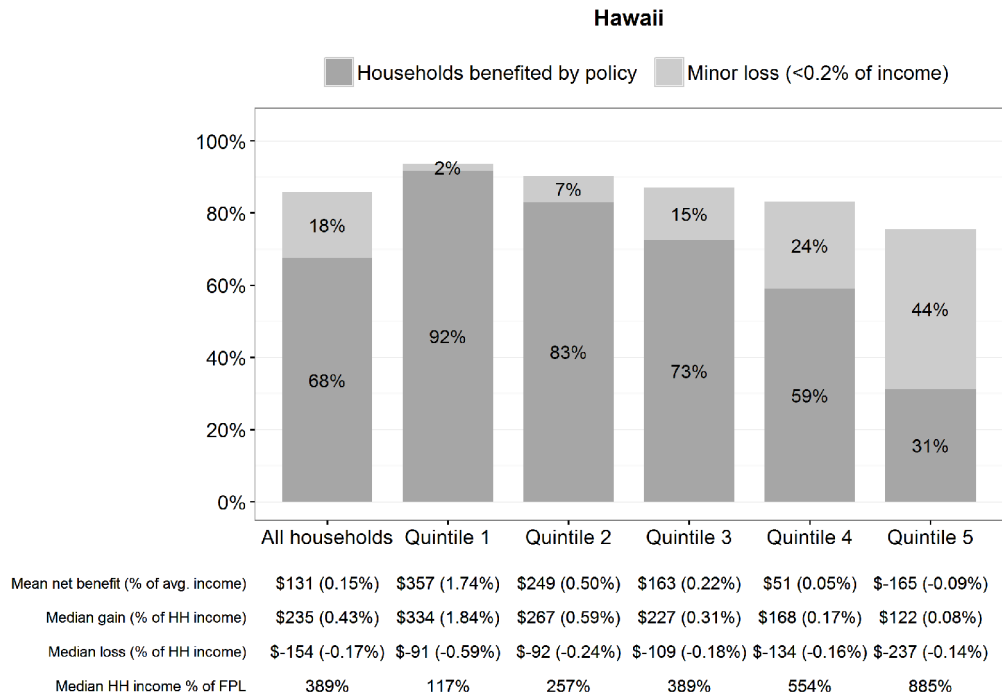


Figure 2: Impact by Quintile for Hawaii. Looking at the categories on the bottom of this graph, only the numbers for “Mean Net Benefit” and “Median HH income % of FPL” include all households in a given quintile (FPL = Federal Poverty Line). Only those households who receive a financial gain are included in calculating the “Median Gain” figures, and likewise, only those households which experience a loss are included in calculating the “Median Loss” figures.

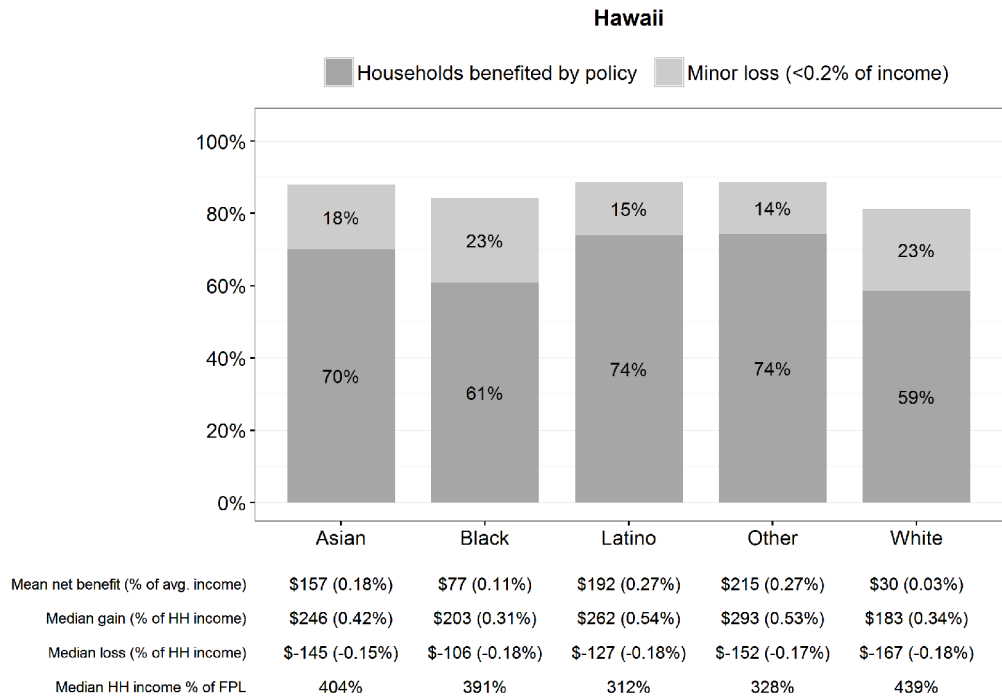


Figure 3: Impact by Race for Hawaii. Minority households tend to do better than white households as a result of lower average incomes (associated with lower carbon footprint) and/or more people per household (larger pre-tax dividend).

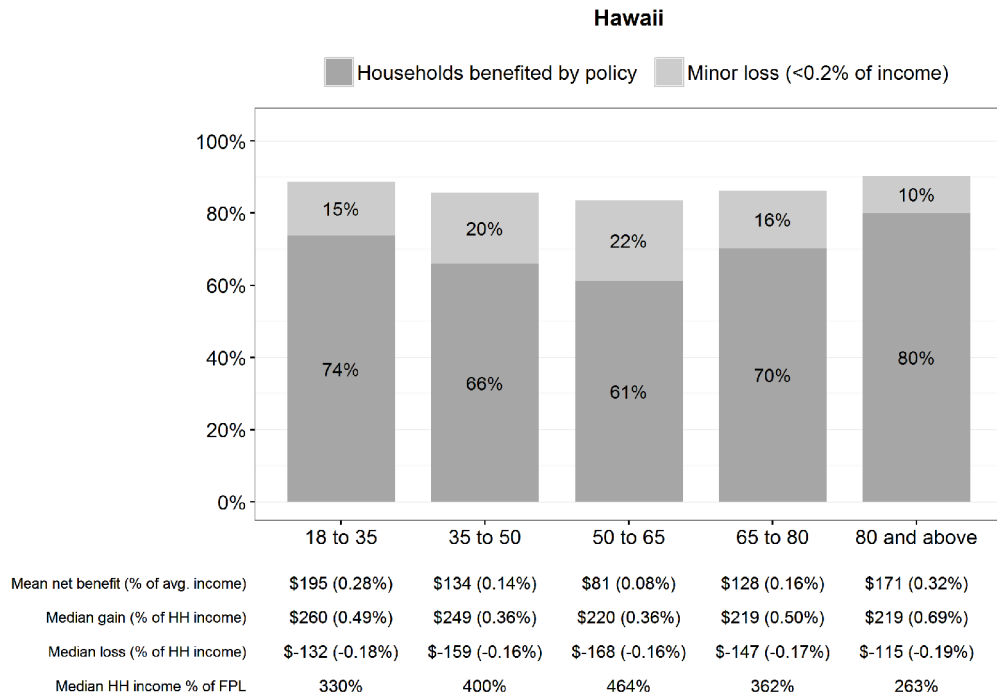


Figure 4: Impact by Age Group for Hawaii. The pattern of benefits across age groups makes sense given the impact of age on both carbon footprints and dividend received. Older households tend to have smaller footprints, reflecting reduced mobility and less consumption as a result of low fixed incomes. Younger households tend to be larger – and therefore benefited by the dividend formula – in addition to less income/consumption in early career.

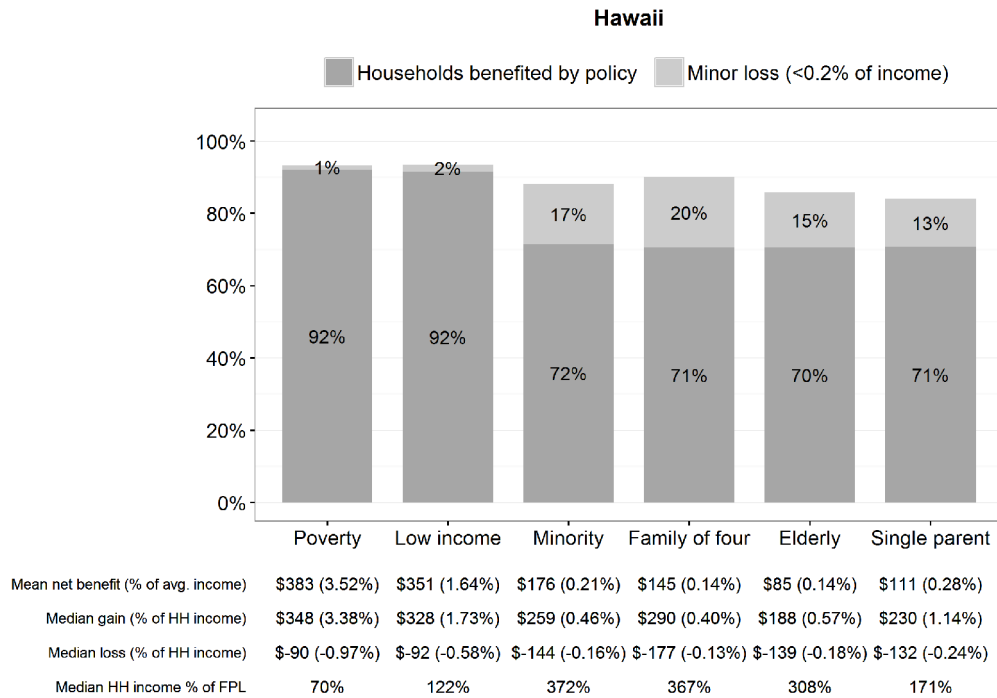


Figure 5: Impact by Household Type for Hawaii. This graph reports data for demographic groups of particular interest to many legislators. “Elderly” households are defined as having a household head age 65 or older, no more than two adults, and no children present. “Poverty” and “Low income” refer to households with income below 100% and 200% of FPL, respectively.

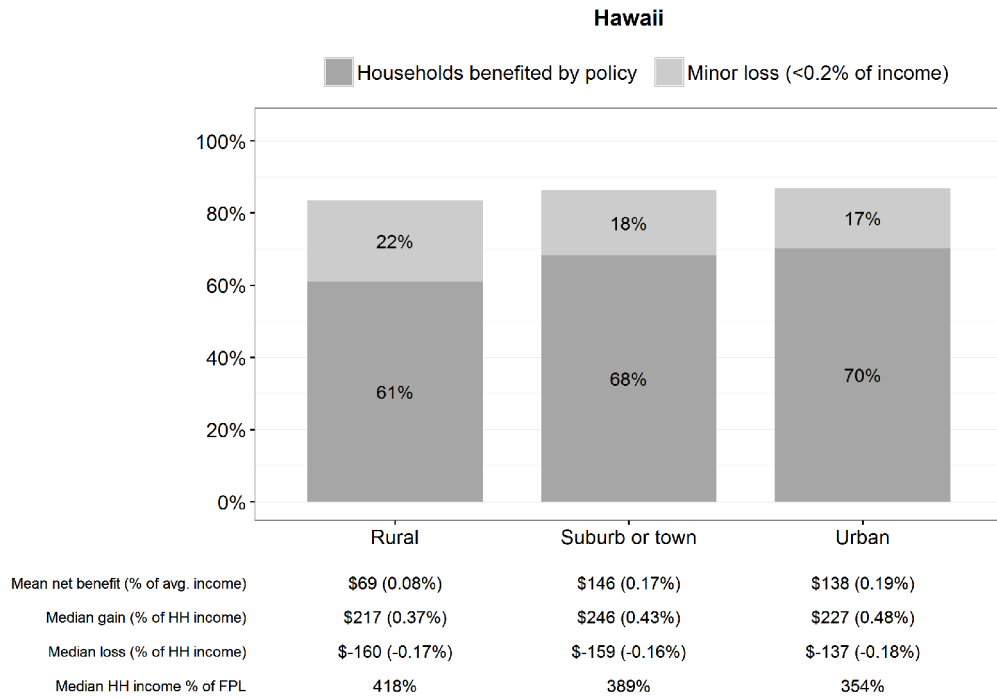


Figure 6: Impact by Community for Hawaii. This graph breaks down data by “community type” – Rural, Suburb or Town, vs Urban.

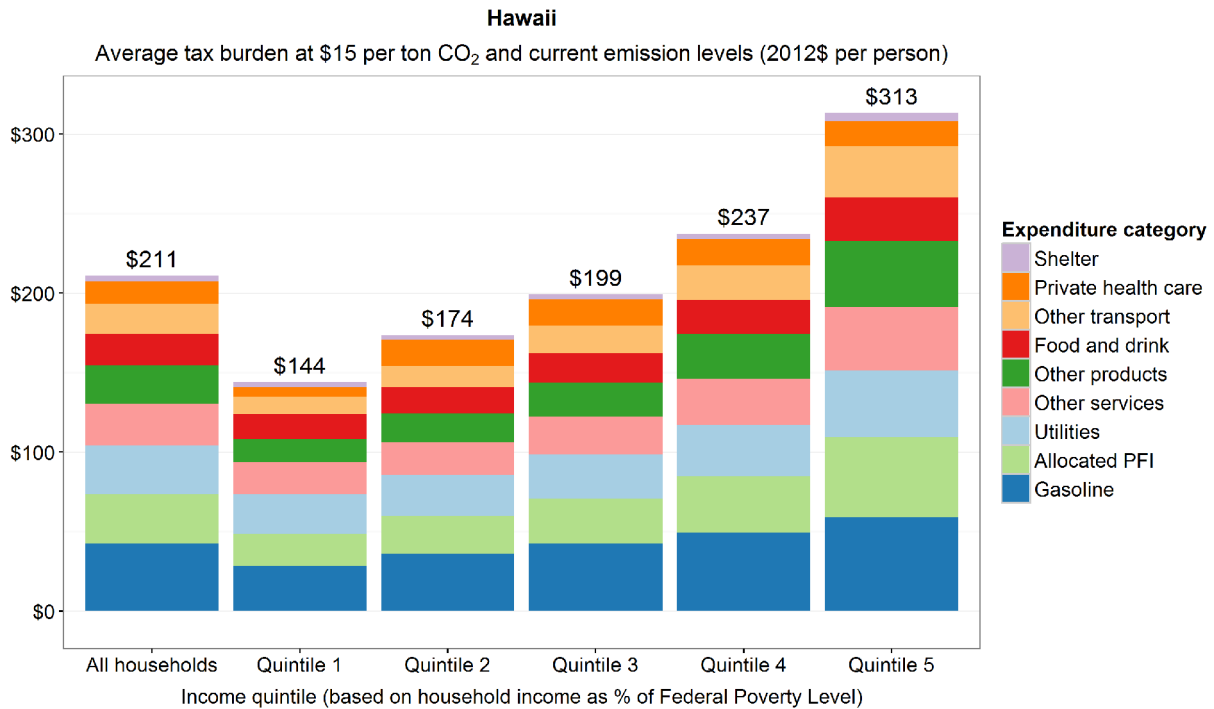


Figure 7: Expenditures by Category for Hawaii. Here we show a breakdown of where the carbon fee increases expenses (i.e. before the dividend) for each quintile. Note that direct energy expenditures (gasoline and utilities) represent less than half of the expense for most quintiles with other products and services making up the rest. Quintile 1 shows low expenditure for private health care since most health care for households in this quintile is covered by government programs. Allocated Private Fixed Income (PFI) measures economy-wide spending on fixed assets (e.g. structures, equipment, software, etc.) that are used in the production of goods and services.

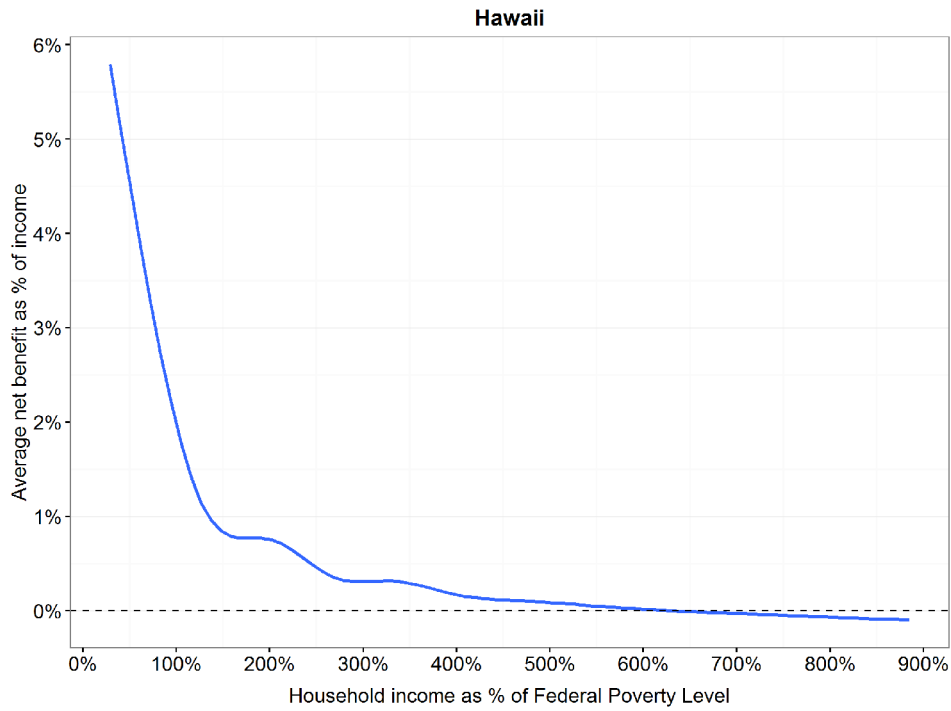


Figure 8: Relationship between benefit and income for Hawaii. This line graph shows the relationship between income expressed as a percentage of the Federal Poverty Level (FPL) vs. the average (mean) benefit as a percentage of income for households. Benefits are highest for those at the lowest income levels and generally positive through 200-300% of the FPL. Average loss for those with higher incomes is relatively small as a percentage of annual income. To avoid anomalies from small sample size at the margins, this graph does not include results for households in the bottom 1% of income, nor those above the 90th percentile of income in Hawaii. This graph also does not convey information about how much of the population in Hawaii is at any given point along the line.

CLIMATE CHANGE COMMISSION
CITY AND COUNTY OF HONOLULU

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July 2, 2019

The Honorable Ikaika Anderson, Chair
and Members
Honolulu City Council
530 South King Street, Room 202
Honolulu, Hawai'i 96813

Dear Chair Menor and Committee Members:

SUBJECT: Bill 25 (2019)

The City and County of Honolulu ("City") Climate Change Commission ("Commission") supports Bill 25 (2019), which adopts the State Energy Code, 2015 International Energy Conservation Code (IECC), with local amendments.

As the City and other stakeholders continue to pursue energy efficiency, renewable energy, and climate resilience goals, it is imperative to update our energy codes to the latest technical standards. According to the City's recently established greenhouse gas inventory, residential, commercial, and industrial buildings are responsible for 37% of the City's carbon pollution. The 2015 IECC addresses numerous energy efficiency improvements that will reduce greenhouse gas emissions and improve long-term affordability for residents. Building codes are an important component of any greenhouse gas mitigation strategy because they address an "energy efficiency gap." Namely, this is the difference in the long-term cost minimizing level of energy efficiency in comparison to what is often actually realized. As our energy system evolves towards a goal of carbon neutrality by 2045, the 2015 IECC with local amendments proposed by the Administration, is enables more cost-effective implementation.

The newly included Tropical Climate Zone option in the 2015 IECC is a notable reason why this update is so impactful to the City. This option flexibly allows for residences to be built in a manner that allows for greater efficiency and comfort in O'ahu's unique tropical island environment. Compliance with the Tropical Climate Zone option has been estimated to result in up to 48% energy savings as well as reduce building (estimated presented by Hawai'i State Energy Office, May 2017, available:

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The Honorable Ikaika Anderson, Chair
and Members
July 2, 2019
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http://www.hawaiicleanenergyinitiative.org/wp-content/uploads/2017/04/2_HowardWiig_May2017.pdf).

The Commission also applauds the City's effort to encourage technologies that reduce our energy consumption and reliance on imported fossil fuels within the Energy Code. Based on the City's abundant and consistent sunshine, a solar hot water (SHW) heater is the most climate friendly solution to heat water for single family homes. Over the course of 15 years, according to estimates by the City's Office of Climate Change, Sustainability and Resiliency, a SHW heater will avoid as much as 29 metric tons of carbon pollution, or the equivalent of 70 barrels of imported oil per household, compared to a standard grid resistance water heater. It will also result in savings of up to \$8,684 per household over the expected life of the equipment.

Finally, as the City transitions to renewable sources of energy for transportation, it is essential that codes allow for innovation and investment in infrastructure to support the transition. Retrofitting existing facilities to accommodate electric vehicle (EV) charging infrastructure can be costly. The EV readiness provision proposed as a local amendment would require that 25% of stalls in newly constructed multi-family facilities over 8 stalls, and commercial parking facilities over 12 stalls be made "EV ready." This is an important step towards achieving the City's transportation goals.

Thank you for the opportunity to submit comments in support Bill 25 (2019). The Climate Change Commission urges you to support them as proposed by the Administration. Should you have any questions, please feel free to contact me at makekana@hawaii.edu or 808-956-2890.

Sincerely,

Makena Coffman, Ph.D.
Chair

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