

## IGP Forecast Assumptions Working Group

Monday, August 31, 2020

9:00 am – 10:30 am

WebEx

### Attendees:

Rocky Mould, City & County of Honolulu	Clarice Schafer, Hawaii Public Utilities Commission
Rene Kamita, Consumer Advocate	Mike Wallerstein, Hawaii Public Utilities Commission
Calvin Opheim, ERCOT	Gina Yi, Hawaii Public Utilities Commission
Ramsey Brown, Hawai'i Energy	Molly Keleher, RMI (HPUC consultant)
Jacqui Hoover, Hawai'i Island Economic Dev Board	Patrick McCoy, Sacramento Municipal Utility District
Henry Curtis, Life of the Land	Carl Bonham, UHERO
Teena Rasmussen, Maui County Community	Kylie Wager Cruz, Blue Planet
Terry Baxter, NV Energy	Noelani Kalipi, Progression Energy
Pono Shim, O'ahu Economic Development Board	Wren Wescoatt, Progression Energy
Amber Riter, Portland General Electric	Robert Harris, TASC
Ashley Norman, Hawaii Public Utilities Commission	Steven Rymsha, TASC
Dave Parsons, Hawaii Public Utilities Commission	Ed Smeloff, VoteSolar
Grace Relf, Hawaii Public Utilities Commission	

### Company:

Ken Aramaki	Christopher Lau
Lisa Dangelmaier	Tim Lueking
Anne Fuller	Earlynne Maile
Cathy Hazama	Mat McNeff
Joanne Ide	Robert Uyeunten
Kolter Kalberg	Paul De Martini, Newport Consulting Group
Yoh Kawanami	Jeremy Laundergan, EnerNex
Sorapong Khongnawang	Sean Morash, EnerNex
Therese Klaty	

### Agenda

- Welcome
- Economic Assumptions
- Forecast Update
- What is happening in other service territories?

### Economic Discussion - Carl Bonham (UHERO)

- Economic conditions and forecast over next several months
- UHERO
  - Each UHERO forecast takes three times as long because of the different policy changes, changing in spreading of the virus, indecision about shutting down, and so on
- The pandemic is affecting U.S. consumer behavior and sentiment
  - University of Michigan consumer index saw a record drop in the beginning of the pandemic in April and May, a bounce in May and June when economies opened nationally, but has flat lined in recent months as virus spreads more rapidly

- Even if the virus is under control at some point, consumer spending and the overall macro economy is going to be slow to come back for an extended period of time
  - In states with open economies, declines in small business revenue from electronic transactions rebounded by late May but has since fallen off over last few months because of the spread of the virus
    - In spring, with stay at home orders, revenues relative to January 2020 were ~50% below in Florida, ~40% below in Texas and ~35% below in Arizona
    - As those economies reopened, they showed recovery
    - But now have retrenched 10-20 percentage points due to spread of virus and not because of closing economies
  - Seeing something similar for O‘ahu based on electronic transactions (similar statewide)
    - 60% drop compared to January
    - Recovered to nearly 20% drop but has shrunk over last several weeks due to rising case counts and people looking to reduce their activity/mobility
- UHERO is analyzing high-frequency indicators (20)
  - Private-source data
    - Dining data
    - Mobility
    - Job Postings
      - Data on payrolls from Pro-Service, HI
    - Google search for COVID
    - Consumer confidence
  - Combining into one index
  - April 6<sup>th</sup> was lowest
    - Recovered about 30% near end of June from low
    - Has decreased since then
  - Uptick in Google searches for COVID
  - Consumer confidence trending downward
- UHERO Forecast developed in second half of April through early May
  - Scenarios are high/baseline/low because the uncertainty is overwhelming
  - Scenarios around timing of capacity utilization are meant to adjust as time went on
    - Low looked reasonable until we started hitting 200-300 cases per day
    - Now looking at tourism reopening at the earliest by mid-November as baseline assumption, with a set of scenarios around that for new forecast being developed
  - Non-tourism economy has been more realistic following low scenario since tourism has lagged
    - Much more of a flat period
      - Some industries in a decline (air transportation)
- Reopening of economy has not happened due to failure to control the virus
  - Inadequate policy at every level from national to state government
  - Failures of individual behavior
- Initial baseline forecast had a very sharp (~ 16-17%) loss in jobs
  - Overestimated job losses due to flawed data
    - A third of unemployment claims were invalid due to fraud and potential duplicate claims
  - Peak loss was not as bad as expected

- Because tourism has not reopened, baseline was not too far off
- Initial baseline forecast had a much smaller (<6%) drop in personal income
  - Support programs limited declines in personal income in 2020
    - Unemployment benefits
    - Direct payments to households (\$1,200 checks)
  - No bounce back in personal income in 2021 because support programs have expired / set to expire
    - Regular unemployment benefits set to expire in January 2021
    - Expanded unemployment benefits expired at the end of July 2020
    - End of PPP
- Policy failures at the national level cause issues in near-term forecast
- Expect to get back to 2016-17 levels in visitor spending by end of 2025
- How fast we recover is dependent on how we control the virus.
- The scenarios are expected to end in roughly the same spot
  - Macroeconomic damage is the thing that could keep the scenarios from ending up in the same spot. Income disparity has worsened.
    - Hit the lower income class the hardest
    - Upper end of income (upper middle class) is less likely to be affected
    - Won't have short term vacation rentals like before the pandemic
- Similar story for Hawaii Real Gross State Product
  - Low scenario gets back to 2016-2017 levels
  - Baseline high gets back to more of a complete recovery
    - Quite optimistic view of remaking Hawaii's economy
- ~ 17% of state survey respondents expect small businesses to close
  - ~ 24% for Maui
- No forecasting model is going to give you a precise outlook.
- Question: How often do you update these analyses?
  - Initially very frequently, but trying to go back to quarterly
  - Nearing end of 3<sup>rd</sup>-quarter release; should be ready in next 2-3 weeks
- Question: Seen anything more recent regarding the surge of cases on Hawaii Island?
  - Goal is to do these indices for each county, but the data doesn't capture the case count surge on Hawaii Island yet. The surge is really recent. The data will reflect the surge in the next few weeks.
- Question: Comment on plus-up for unemployment insurance that was not accepted by Trump's \$300 insurance. What is the fallout if the state does not act?
  - Did an analysis of the full CARES spending.
    - Did not do an analysis with and without the plus-up
  - State intends to accept federal insurance and UHERO plans to put that into the next forecast
  - Expect a rise in the number of people who receive benefits
  - Support programs are the reason the income forecast was about half as bad as the job forecast
  - Decrease in support programs along with job loss are the reason why the forecast has a decline in population
    - People are worried about trying to pay rent and put food on the table
    - People will be going back to where they have support systems
      - Either that or homelessness
- Questions: Are you taking into account debt overhang in your model?

- Will show up in forecasted construction of housing
- It's there but not modeled explicitly outside of housing
  - There will be failures because debt won't be repaid
  - Hawaii is in the top 5 states for non-paying mortgages
    - 9.1% of mortgages are not current
      - Some of them are in forbearance and payment plans
      - Housing listing are starting to show foreclosed properties
  - It will show up in businesses that can't pay their lease rents
- Question: What do you see as peak tourism?
  - Forecast gets back to about 80% of previous peak tourism levels by 2025
  - Doesn't change much by forecast scenarios
    - Take with a large grain of salt
    - Too much uncertainty
    - Really optimistic scenarios could see 6-7 million visitors by the end of next year
- Question: Given that consumer behavior has changed, are there any new metrics to look at?
  - Consumer confidence
  - New metrics still need further testing/ comparison to longstanding metrics

### Forecast Updates

- Unprecedented time of the COVID pandemic led the Company to relook at our forecasts.
- The load forecast is one of the many assumptions that the planners use in their models to stress test resource plans under varying conditions. We don't have to build forecasts for every assumption that may vary over 30 years but rather provide a wide enough range to plan around.
- The planners can also test other sensitivities as they are running models such as was identified through discussions with the Solutions Evaluation and Optimization Working Group ("SEOWG") and the Technical Advisory Group.
- The forecast is used to start the planning process.
- Presentation slide decks will be posted after the meeting
- O'ahu:
  - Projected GWh sales with all layers included, graph (slide 6) shows difference between updated and the March 2020 forecast.
  - Pandemic's effects were rapid and dramatic, and recovery is likely to take awhile
  - Economy driven by tourism but defense component supports activity
  - In long-run, the economy is expected to resume growth
  - Layers are the same as discussed in previous FAWG meetings
  - Peaks are expected to increase as more people stay at home during peak times
  - Less of a decline in peak forecast
- Maui:
  - Sales impacts are driven by changes to underlying sales
  - Recovery will take longer due to reliance on tourism
  - Residential and large business classes will recover faster than small and medium business classes
    - As Carl Bonham noted, 24% of Maui small businesses surveyed said they don't expect to survive.
  - 2022-23 sales will recover slightly but offset by downward pressure from DER and energy efficiency result in year-over-year declines.

- Recovery returns to all-in positive growth in 2024
- Peak forecast follows sales, but impact is expected to be a little bit less
- Molokai:
  - Only forecasted impacts for 2020 due to small impact to Molokai due to the pandemic
  - No change to annual peak forecast
- Lanai:
  - Sales reflects impacts of resort closures from the pandemic
  - Potential to recover more quickly than Maui
  - If travel restrictions are extended into 2021, decrease could push into 2021
  - Peak forecast updated not due to pandemic but due to newly available load data
- Hawaii Island:
  - Decline in sales like other islands with slow recovery, but not as severe as other islands
  - Residential sales are expected to stay similar to slightly lower near-term unlike Oahu
  - Peak forecast highly dependent on residential class and will decrease in near-term
- Question: Have you calculated peaks minus storage transfers (batteries)?
  - Forecast includes pairing of PV with batteries, so it is factored into the forecast
- Question: Confirm that there are no changes to the other layers?
  - That is correct
  - EVs are very small in near-term
  - DER applications have not let up since pandemic began
  - No new information for energy efficiency so no changes made
  - Sensitivities were created to capture this uncertainty
- Question: Will you upload forecast data? Will sensitivity data be posted?
  - Layer data has not changed but will upload new UHERO forecast data
  - Responded to commission's request which included sensitivity data
- Question: Will underlying assumptions be presented?
  - Should be presented next few slides

## Sensitivities

- There is huge uncertainty on what the future may look like which is why forecast sensitivities were developed.
- The stacking of the layers, energy efficiency, DER and EVs in different combinations allows us to get to a high and low range or defining the bookends.
- We focus on building sensitivities on the layers that have the most uncertainty which tends to be customers adopting behind the meter technologies.
- Forecast has been focused on reference case but will show the bookend ranges
- High sensitivity uses low energy efficiency, no future DER after 2020 for low DER and high EV adoption forecasts.
- Low sensitivity combines high achievable energy efficiency, high DER forecasts from our last long term planning cycles as a proxy for rooftop potential which will be replaced once the NREL rooftop potential study is completed and a low EV adoption forecast to arrive at large jaws around the reference forecast.
- There are many ways to combine the layer sensitivities that will result in forecasts that are within the bookends. The planners have identified some sensitivities to run with input from the SEOWG and may identify more conditions to test.

- The bookend high and lows were updated to include the impacts from COVID to start the planning process. It doesn't have a significant impact to the long-range planning. There will be additional IGP cycles and opportunities to refresh the long-term forecasts.
- The forecast that developed is at the beginning of the planning process. It represents the energy the customer is using whenever they want to use it. We don't have the knowledge of what the system is able to support and that enters during the resource planning stage. Demand response programs and controllable DER which occurs downstream of us is evaluated in the modeling phase.
- Additional sensitivities will be evaluated in the modeling phase
- Reference to forecast found on HECO's IGP website and responses to commission's information requests
- Question: Is there any time differentiation between peak sales and low load periods?
  - Hourly forecasts were developed and provided for use in the modeling phase
- Question: Is the hourly forecast made available?
  - Currently, only the annual peak forecasts have been provided but can take a look at posting hourly forecast
- Question: Can you make available the data for peak load by island by year? When does the system peak occur for each island?<sup>1</sup>
  - Can look into making that data available in the modeling phase
- Question: Is advanced rate design included?
  - No, not yet in this process of the forecast. Information is not yet available.
- Question: What would the forecast look like without those layers? And what are the costs? Did you analyze the costs of different energy (Cost-benefit analysis) from the layers to better align programs and advance rate design with the needs of the grid? What is the full cost that will be required to achieve our goals?
  - Could be answered in the modeling phase
  - That is the reason why layers and sensitivities are provided to downstream planners
- Question: Is the FAWG going to share the forecasts for fuel/resource costs, EV adoption, and charging profiles?
  - Charging profiles were already presented
  - Fuel forecast and resource costs were presented in a prior FAWG meeting and files are posted on the website<sup>2</sup>
- Links to the FAWG material and forecasts, pre-COVID, are posted to the IGP website.
- The slides from today will also be posted to the IGP website.
- More detail on the development of the forecast can be obtained from the Commission's document management system under Docket 2018-0165. Information requests 1 and 2 were filed on July 2nd.

## Experiences Elsewhere

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<sup>1</sup>The annual system peak for all islands generally occurs between 6:30 and 7:30 pm and is not anticipated to change during the duration of the forecast.

<sup>2</sup> The fuel forecast and resource costs were presented in the April 20, 2020 SEOWG meeting which the FAWG was invited to. See below for the links to the forecasts:

[https://www.hawaiianelectric.com/documents/clean\\_energy\\_hawaii/integrated\\_grid\\_planning/stakeholder\\_engagement/working\\_groups/solution\\_evaluation\\_and\\_optimization/20200420\\_wg\\_seo\\_igp\\_2020\\_fuels\\_forecast.xlsx](https://www.hawaiianelectric.com/documents/clean_energy_hawaii/integrated_grid_planning/stakeholder_engagement/working_groups/solution_evaluation_and_optimization/20200420_wg_seo_igp_2020_fuels_forecast.xlsx)

[https://www.hawaiianelectric.com/documents/clean\\_energy\\_hawaii/integrated\\_grid\\_planning/stakeholder\\_engagement/working\\_groups/solution\\_evaluation\\_and\\_optimization/20200717\\_wg\\_seo\\_resource\\_cost\\_forecast.xlsx](https://www.hawaiianelectric.com/documents/clean_energy_hawaii/integrated_grid_planning/stakeholder_engagement/working_groups/solution_evaluation_and_optimization/20200717_wg_seo_resource_cost_forecast.xlsx)

- Amber Riter (Portland General Electric) – Forecasts depend on the spread of the virus and doing scenario analysis to manage that
  - Completed a forecast update in April and doing more frequent updates to capture more recent data
  - Service territories' economies are very different from Hawaii
  - PGE energy delivery was 40% residential, 40% commercial, and 20% industrial
  - Total deliveries are not off as much but underlying class compositions changed
    - Residential up 5-10%
    - Commercial is down 10-15% depending on the segment
    - Restaurants & Lodging make up 5% of deliveries and are hardest hit
  - Closely monitoring education, government, and office buildings
  - Back to normal?
    - Following trends with area businesses to determine when they are bringing people back into the office
    - Exploring long-term implications such as working from home in the future
      - Hasn't been integrated into the model just yet
- Calvin Opheim (ERCOT)
  - Forecast updates on quarterly cadence (most recent is May 31)
  - Did a COVID scenario in May.
  - Will update again in September
  - New normal?
    - Still huge uncertainty
    - Planning for extended work from home policy
    - Create a weekly analysis of peaks in Texas
      - Very little change; maybe 1% loss in energy
        - reductions are seen in morning hours from 6:00AM to 10:00AM
      - Impacts very muted
      - Moody's showing 2% drop in non-farm employment and expected to get back to pre-COVID levels by end of 2021
- Terry Baxter (NV Energy)
  - Southern utility in Las Vegas dependent on tourism
    - Steep drop in large commercial class
      - 10% in March
      - 15% per month for April-June
      - Little less in July, seen a 10% decrease compared to last year
    - Small C&I down about 6%
    - Residential has been booming;
      - June, July and August significantly higher than last year
      - Year-to-date about 2% above year
      - Mainly due to use per customer in summer months
        - More people working from home
  - Northern Utility- has a lot of mining not impacted by COVID
    - Residential sales up significantly
    - Small C&I down about 2.5%
      - Could get worse with foreclosures
    - Large C&I down about 2%

- Less hotels and casinos in northern Nevada (e.g. Reno versus Las Vegas)
    - Peak demands setting records up north due to residential stay at home
  - Get economic data from Global Insights
  - Anticipate around 2022 getting back to 2019 levels
  - Did a forecast in April, May, July and probably do another one in August
    - Filed integrated resource plan amendment in June that uses the April Forecast
      - May be too high
- Patrick McCoy (Sacramento Municipal Utility District)
  - Experienced dip in March
  - From May to now, could be the hottest summer on record
  - Expected to exceed record system peak but fires may have affected the peak slightly
    - Huge impact from weather
  - Get data from IHS Markit and are expecting flat sales through 2026 before trending upwards again
  - A lot of employment in the public sector, government work with many working from home
  - Unemployment in the service sectors
    - Restaurants pivoted to pick-up, delivery and outdoor dining
  - About 56k of 65k C&I accounts are small commercial accounts
    - About 15-16% of revenue comes from this class
  - Majority of revenue comes from the other 15% (large) commercial customers
  - New construction has increased
    - Both commercial and residential
  - 6% energy use in June/July but now to 3% for residential class
  - System peak has shifted to earlier evening hours but has not decreased much
    - Was 6:00PM / 7:00PM
    - Now trending more to 5:00PM hour
  - Seen decrease in total commercial customer revenues, small commercial taking the brunt
  - Seen a 14-15% increase in average commercial use (per customer)
  - System down 6% but forecasting 4% decrease through rest of year
  - Expect to move into a recession in 2021 and 2022, possibly through 2023. Back on track in the 2025 timeframe.
    - ~10% drop in employment
      - Unemployment level of 9-15%
        - Mostly in the service industry
    - Dip in personal income of about 5%
    - Dip in GDP of about 8%
  - PV adoption has not changed much but there was a slight dip in March/April
    - Strong in commercial class (17-18 MW at end of 2020)
    - Slight dip in retrofit market
    - Strong growth in new residential construction PV installs because California requires all new residential homes to have a PV system installed.
    - Resiliency is likely a driver (because of fires)
      - Possibly see a slight uptick in 2020 for PV + batteries installs
  - Currently developing rate for new NEM program – NEM 2.0
    - Addressing virtual NEM rate.



- Difficult for customers to determine economics of PV systems until their board makes decisions