Forecasting Working Group Assumptions Meeting
Tuesday, August 27, 2019
8:30am – 1:30pm
American Savings Bank Tower, Training Room 1

Attendees
In-Person
Carl Bonham – UHERO
Ramsey Brown – Hawai'i Energy
Henry Curtis – Life of the Land
Binsheng Li – DBEDT
Rocky Mould – City & County Honolulu
Teena Rasmussen – Maui County
Community
Ingrid Rohmund – Applied Energy
Group (AEG)
Clarice Schafer – Commission
Pono Shim – O'ahu Economic
Development Board
Kylie Wager Cruz – Blue Planet
Wren Wescoatt – Progression Energy
Kurtis Kolnowski – AEG (guest)
Ken Walter – AEG (guest)
William Giese – HSEA

Company Employees

Paul De Martini
Ken Aramaki
Marc Asano
Collin Au
Divesh Dhingra
Anne Fuller
Cathy Hazama
Joanne Ide
Mike Ito
Kolter Kalberg
Therese Klaty
Christopher Lau
Vladimir Shvets
Thomas Yokota
Peter Young

WebEx
Dave Parsons – Commission
Ashley Norman – Commission
Jessie Ciulla – Rocky Mountain Institute
Patrick McCoy – SMUD
Calvin Opheim – ERCOT
Jason Prince – Rocky Mountain Institute
Amber Riter – Portland General
Leland Cockcroft - HELCO

Objective
- **Present assumptions used to develop forecasts**
- **Discuss sensitivities and scenarios to create a forecast range to address uncertainties**
- **Gather feedback on assumptions and for developing sensitivities and scenarios**

Agenda
- **Welcome and Overview**
- **Underlying Forecast Assumptions**
- **Electrification of Transportation Assumptions**
- **Distributed Energy Resources Assumptions**
- **Breakout Sessions**
- **Report on Breakout Session**

Discussion

1. UHERO – State Forecast Update
   a. State forecast update provided to the utilities as inputs
   b. Don't expect much growth in the state's economy
   c. New record unemployment but not necessarily a good thing
   d. Global trade fell off a cliff in 2018
      i. Affected by trade war and tariffs
      ii. Cause a decrease in international visitors
      iii. Average home is expected to see an increase in costs in the $500-$1000 range
         1. This is around the same as the average tax cuts
   e. In May, talked about tourism boom, might be over, now we are saying it is over.
      i. Some of it related to eruption and floods.
      ii. Almost recovered 1990 numbers
      iii. Even though number of visitors are higher. Spending patterns are different, people are spending less.
      iv. Value of foreign currency may have changed resulting in lower US dollars spent
      v. Real spending dollars spent has declined
      vi. Economic impact of tourism has been studied for specific areas such as Waikiki, but there are no studies for the island as a whole
   f. Bill 89 (Vacation Rentals) will have an impact on economic forecast
      i. Not enough data points are collected to address situations such as employees of vacation rentals
      ii. The general public do not fully understand the bill that results in uninformed decisions that could affect the economy
         1. Example: People cancelling reservations already made for December
      iii. Possible 5%-10% increase on home prices and rental rates
   g. A population decline will influence the labor force
      i. If Hawaii's economy decreases while the U.S. economy increases, you will see more outflow of population
      ii. There is already a significant outflow due to military dependents
   h. There is still pent up demand for housing albeit limited appreciation in home values
      i. Housing market currently not in a bubble as in years prior
   i. Hawaii facing increased uncertainties;
      i. Trade War with China
      ii. European Recession
      iii. US not likely going into a recession in 2020
      iv. Bill 89 impact on tourism, home prices and construction

2. HECO - Electricity Price Forecast
   a. The 2016 PSIP plans have been updated to accommodate the filed and approved stage 1 RFP projects and the Stage 2 resource targets
   b. The year 2045 shows a spike in prices partly due to biodiesel conversion
      i. Such a forward-looking number will most likely change as other renewable efforts are implemented

      ii.   While electricity price is a driver of the underlying forecast, as shown in the waterfall chart it is not a large driver

c. Certain stakeholder show apprehension about relying on biodiesel to get to 100% renewable generation

d. Some stakeholders felt that the lack of monthly bill decreases could result in a decrease in public interest in renewable energy

e. The E3 resource plan with generation modernization was used as a starting point but will be updated with new resource timing

3. HECO – Weather

   a. Most econometric models for electricity consumption have a weather variable

      i.   Primary variable is temperature (or derived from temperature like cooling degree days)

      ii.   The reference forecast reflects average weather conditions as opposed to extremes

      iii.   The bases for the proposed temperature trend is 30 years of local historical temperature data

         1. Primary reason for looking at 30 years to derive the trend was to include enough history to capture multiple short-term cycles and the longer-term climate change trend

         2. Proposed method is to use 20-year average temperature as the starting point, which is then trended upward over time at the rate derived from 30 years of local historical temperature data

         3. Some stakeholders think that using a constant increase in temperature due to global warming assumes no acceleration when there could be

      iv.   Some stakeholders think that a wider range in temperature and other variables should be used

      v.   A stakeholder commented that it is inconsistent that resource planning uses worst case scenarios while planning and forecasting uses averages

   b. An updated U.S. National Climate Assessment report is available from NOAA however it does not have the same detailed Hawaii scenarios that the 2013 report had

4. HECO - Electrification of Transportation

   a. The electrification of transportation focuses on light duty vehicles and buses. Inputs into developing both forecasts were presented for each county (Honolulu, Hawaii, Maui). Currently the bus forecast includes the City & County of Honolulu only. We will reach out to various bus operators in the other counties to assess the adoption of electric buses.

   b. Light Duty EV's

      i.   The first set of assumptions go into deriving the number of EVs as a percent of total light duty vehicles.

      ii.   Population is used to derive the total light duty forecast.

      iii.   Vehicle miles traveled, weighted average fuel economy and annual kWh/vehicle are used to derive the energy required by the EVs per year.

        iv.   Although the number of vehicles is increasing, the rate of increase will be moderated as other transportation options will be available (rail, buses, car and ride share).
   - c. Some stakeholders think changes in demographic behavior should be analyzed
     - i. Newer generation anecdotally drives less than older generations
5. HECO - E-Bus Assumptions
   - a. The number of buses per operator was provided by the company's Electrification of Transportation Division based on discussions with the various bus operators.
   - b. Route information was obtained from the bus operators or by reviewing existing routes and most likely to convert to electric based on distance and operating hours.
   - c. Technical specs on the battery size, charging rate and fuel economy (kWh/mile) from currently available electric buses were used to determine the energy required to charge the buses.
6. HECO - Input into DER Forecast
   - a. Operation goals for grid services and DER are being developed as part of the IGP process
   - b. A stakeholder suggested that project prices be compared to publicly available permit declared costs. Numbers presented for example PV with storage systems were higher than average declared permit costs for a mixture of PV systems of unknown size and unknown pairing with storage.
   - c. The PV forecast does not assume replacement of the system, just degradation
   - d. Some stakeholders note that the inflation rate they have is less than what HECO used
     - i. HECO used GDPIP numbers to be consistent with what was used in PSIP
     - ii. UHERO provides a forecast of Honolulu CPI, which could be used instead of GDPIP
   - e. While defection is not directly accounted for, people who offset most of their energy usage are
     - i. To account for defection more research needs to be done, i.e. motivation for investing in such a large system that could sustain the average home off-grid indefinitely
7. Closing remarks
   - a. There are other assumptions used in the resource planning that have not been presented today. Another meeting will be held to present those assumptions.
   - b.
   - c. Assumptions will be finalized within a week or two
     - i. Forecast needs to be finished around October-November
   - d. Another forecast meeting will cover resource and fuel forecasts
   - e. Assumptions will most likely be in some report, probably at a review point to the PUC
   - f. Price elasticity is an output of the forecasting model

Next Steps
- **Chris Lau's group will present on more resource assumptions**
- **October - November: Preliminary Forecast**
- **November – December: Finalize Forecast**