

Session 5: SWIFT Forecasting

John Zack, Dora Nakafuji

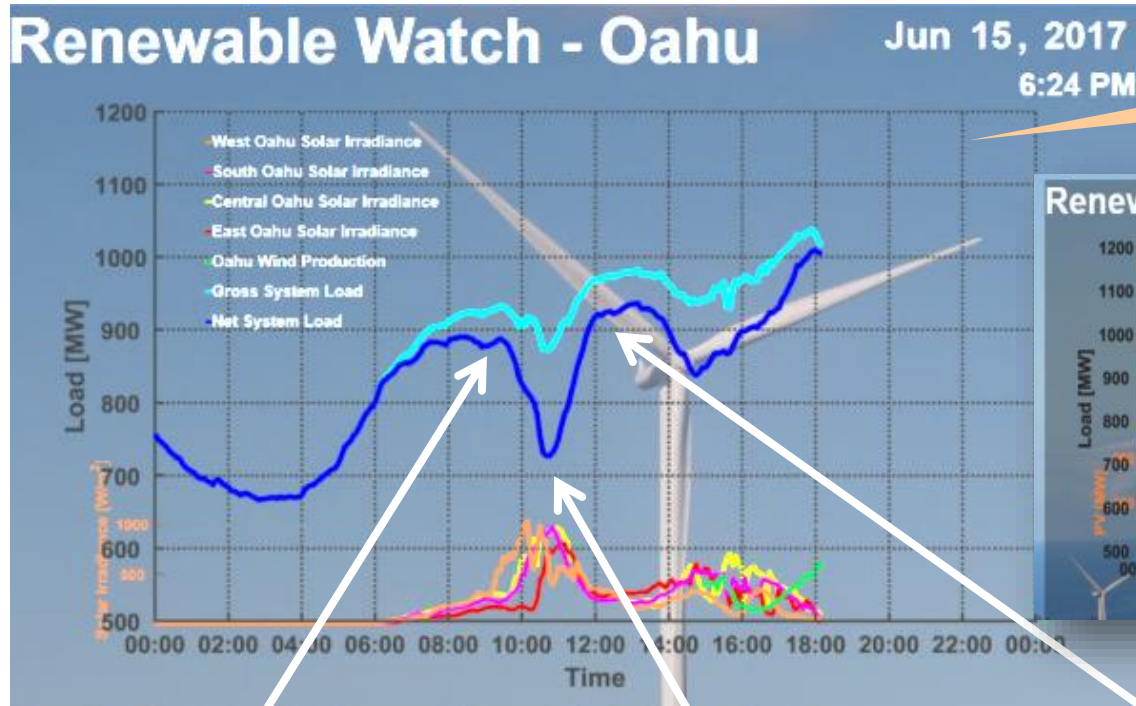
UVIG

6/21/2017

Panel Questions

1. What have been the recent experiences by ISOs/utilities doing distributed solar forecasting?
2. Can detailed forecasts be used to help operate the distribution system?
3. Are we moving towards a combined DG/load forecast in the future?

1. Recent Experience: Small Scale Rapid Events -> Chasing Load

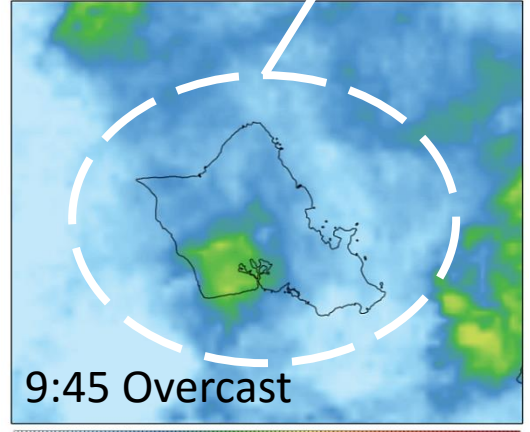


Approx 200 MW Down and Up Ramp

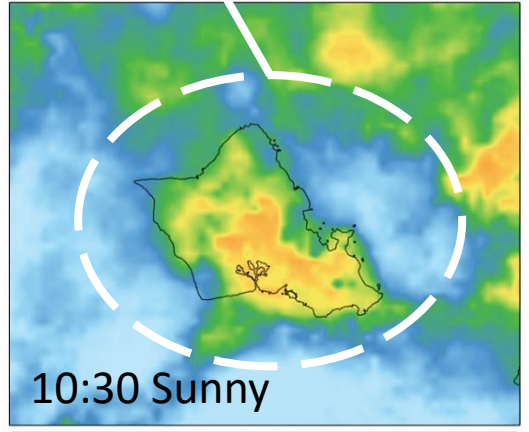


Prior Day more "typical" operation (non-ramping)

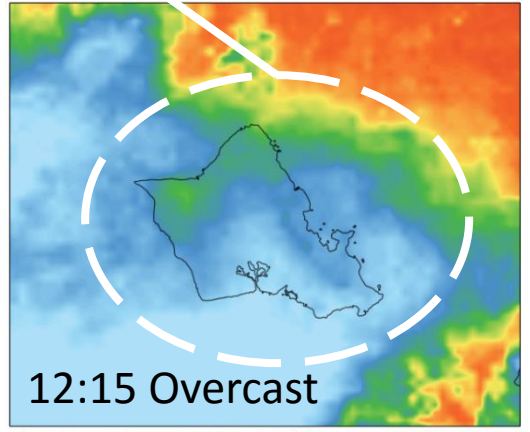
Est. Irradiance (W/M²) Updated: Jun-15-2017 at 09:45 HST



Est. Irradiance (W/M²) Updated: Jun-15-2017 at 10:30 HST



Est. Irradiance (W/M²) Updated: Jun-15-2017 at 12:15 HST



2. Yes, But forecasts Supplemented with Enhanced Situational Awareness are Needed

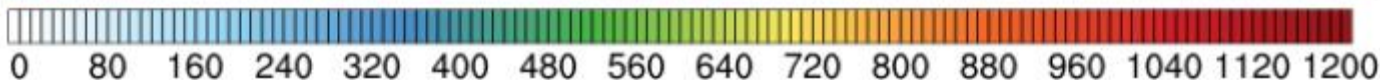
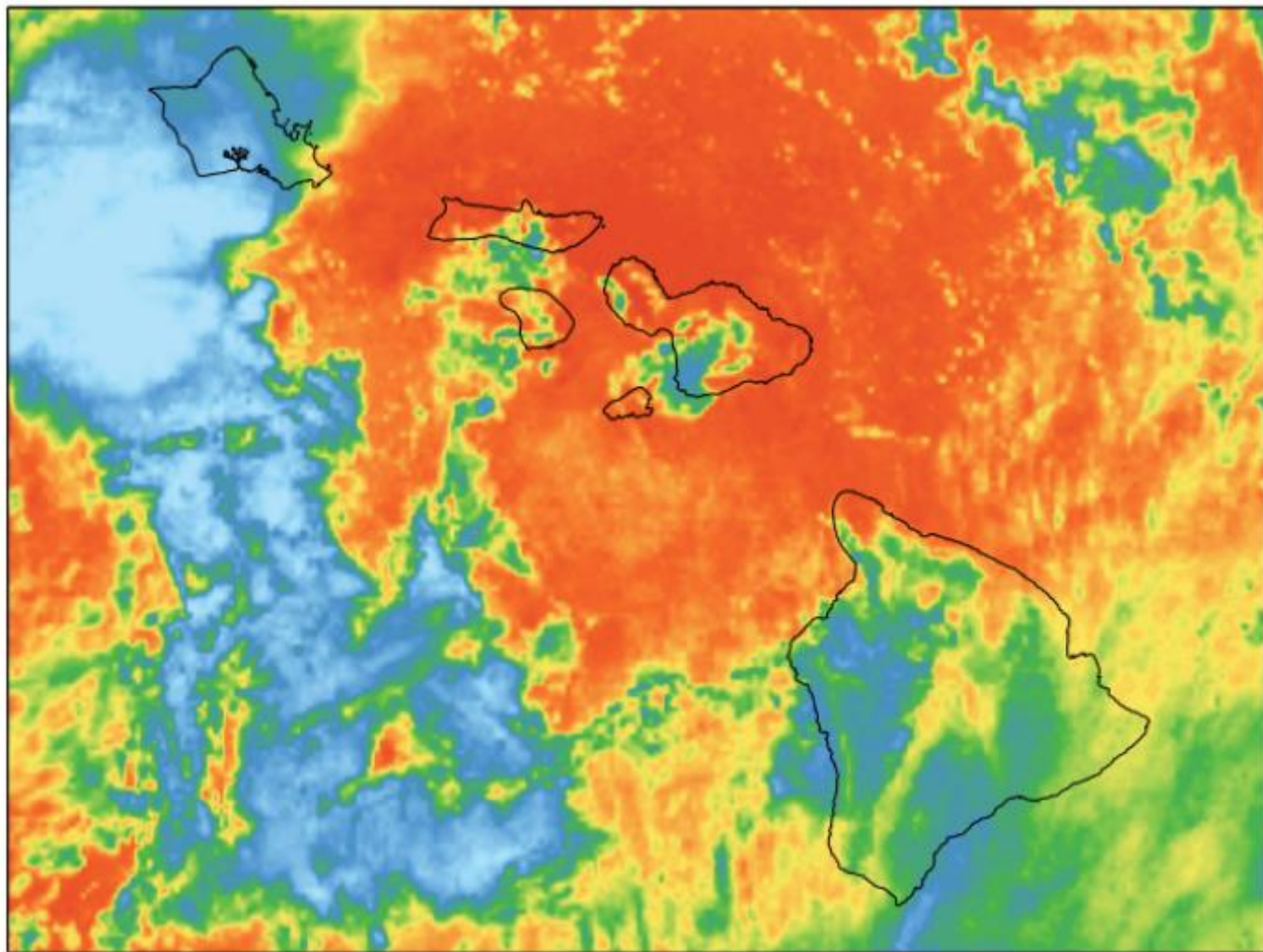
- Experience: Operations using renewable forecasts to inform unit commitment decisions.
 - **Short duration events are hard to forecast and hard to balance (economically) especially on islands. High concentrations of PV result in uncertainties in forecasts.**
 - MAE and RSME are not good metrics for gauging these short duration events
 - Event-driven uncertainty metrics needed to assess these events
- In Progress: Situational awareness visuals are likely needed to “trend” and estimate uncertainty for such events.
 - Investigating indicators in the 5-15min time frame to complement solar forecasts.
 - But question remains, “What can you do in 5-15min?”
- Looking forward: Post-event evaluation of system and weather conditions with forecasts will inform the development of new operating procedures and build confidence for their use

2. Bird's-Eye Visuals Providing 5-15 min Awareness

Est. Irradiance (W/M²)

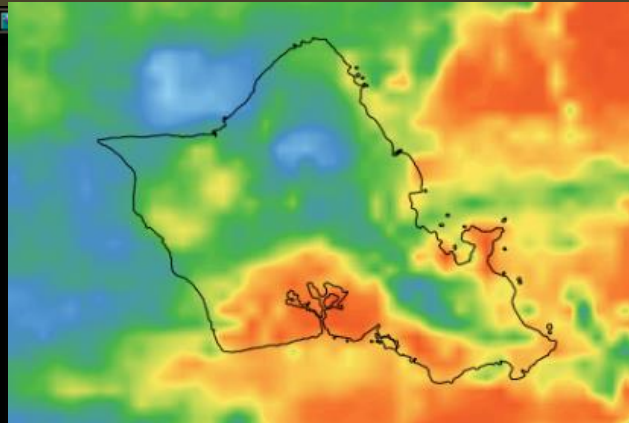
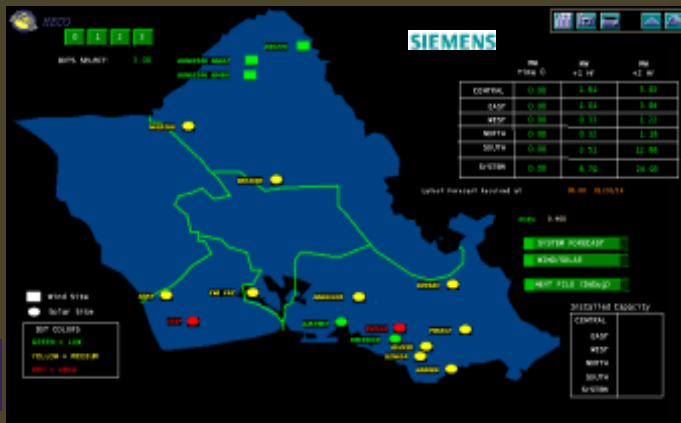
Updated: Jun-15-2017 at 13:15 HST

Bird's-eye view provides a 5-15min look-ahead to "trend" and alert on likely weather conditions and resulting system impacts



Hawaiian Electric
Maui Electric
Hawai'i Electric Light

3. Integrating Load and VDER into Grid Tools



- Geographic displays
- Link System Impact with Weather Features
- Post Event analysis & Reviews with Ops increase awareness

