



# HIGH PENETRATION PV INITIATIVE

## Field Monitoring

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Sacramento Municipal Utility District

Status Update Meeting  
April 20, 2012



Hawaiian Electric Company  
Maui Electric Company  
Hawaii Electric Light Company



# CIRCUIT CASES

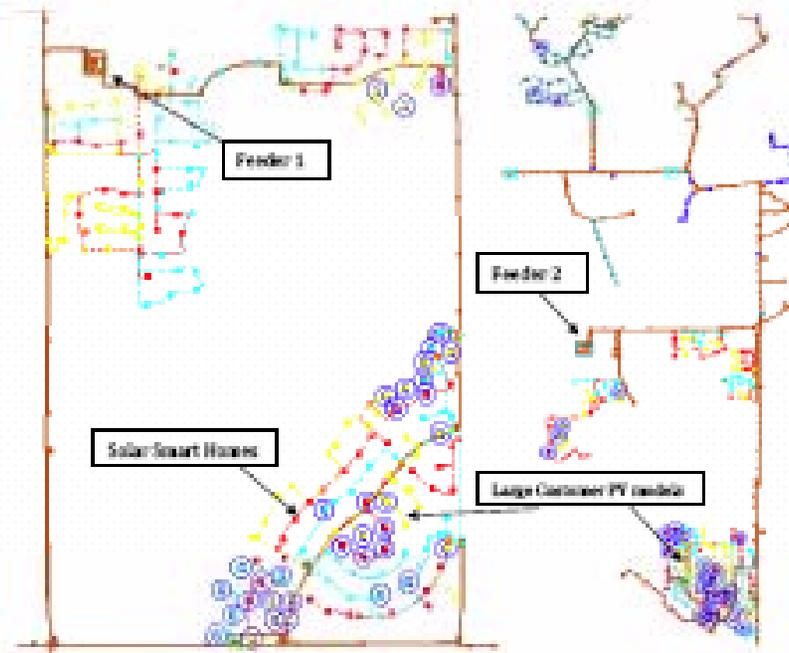
1. SMUD A-C feeder
2. SMUD C-T feeder
3. SMUD E Substation Bank I

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4. SMUD E-B Feeder
5. SMUD N-A Feeder
6. SMUD R-F Feeder
7. HECO 1
8. HECO 2
9. HELCO
10. MECO

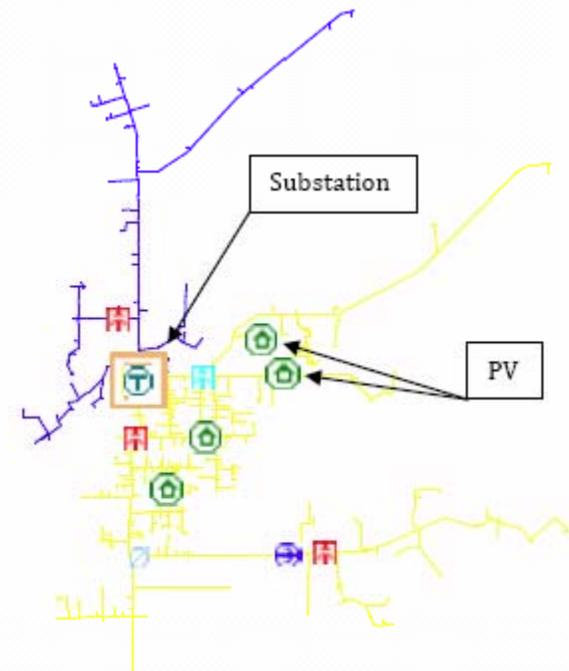
# SMUD A-C feeder

This feeder supplies a “SmartSolar home” subdivision (170 homes) in Sacramento County. The solar penetration level on this circuit is currently 13 % under lightly loaded conditions. The load is a combination of commercial and residential.



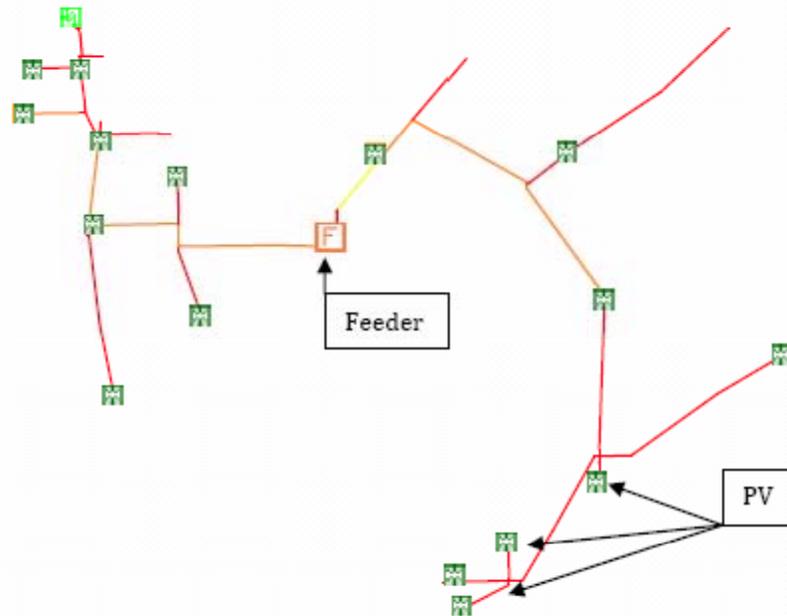
# SMUD C-T feeder

This feeder supplies SMUD's Rancho Seco facility as well as a small rural load. About 3 MW of installed solar PV capacity is located on the property, although only 2 MW of generation is realized due to the age of most of the PV modules.



# SMUD E Substation Bank I

The feeders in this bank supply a combination of residential and rural loads. There were currently no PV systems on these feeders. This bank is of particular interest because about 68 MW of PV have been installed along the feeders as part of the FiT Program.



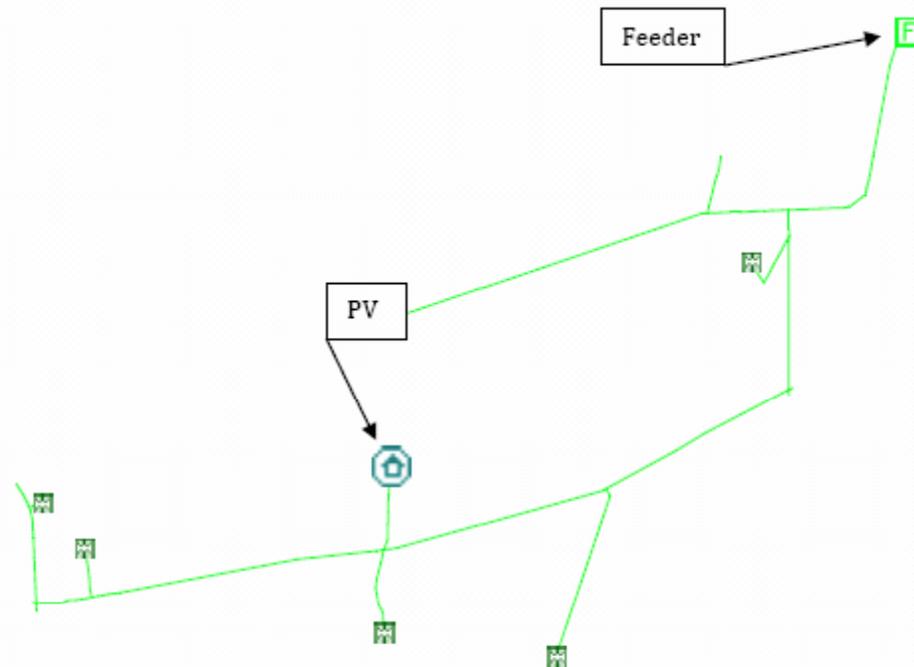


# Field Validation Locations & Devices



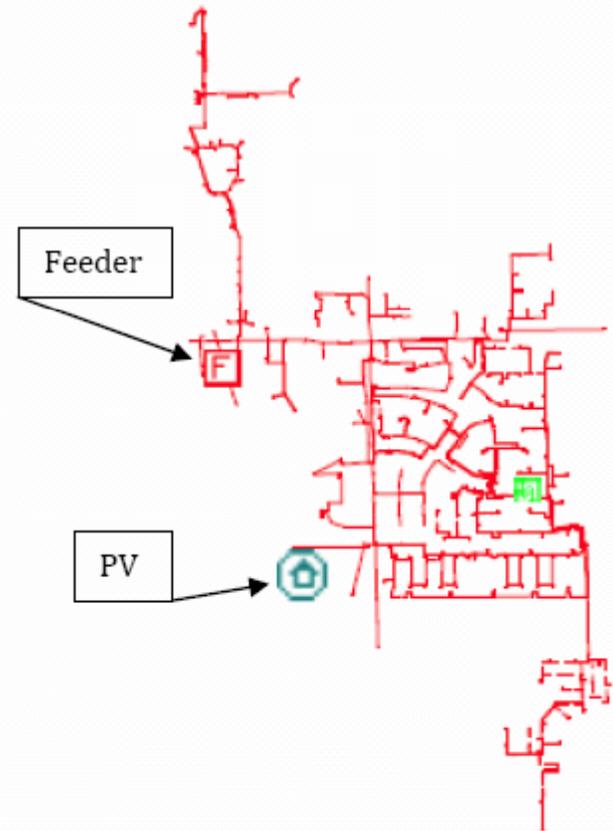
# SMUD N-A feeder

This large SMUD customer has installed a total of 6 MW of PV at two locations on their campus. This site is of particular interest because it is currently the largest PV installation in SMUD's service territory.



# SMUD R-F feeder

A large SMUD customer has currently installed approximately two 1 MW of PV, total capacity of approximately 2 MW at one of their facilities in Sacramento. This 2 MW installation is expected to result in a 30-40% penetration level on the feeder.



# Field Devices



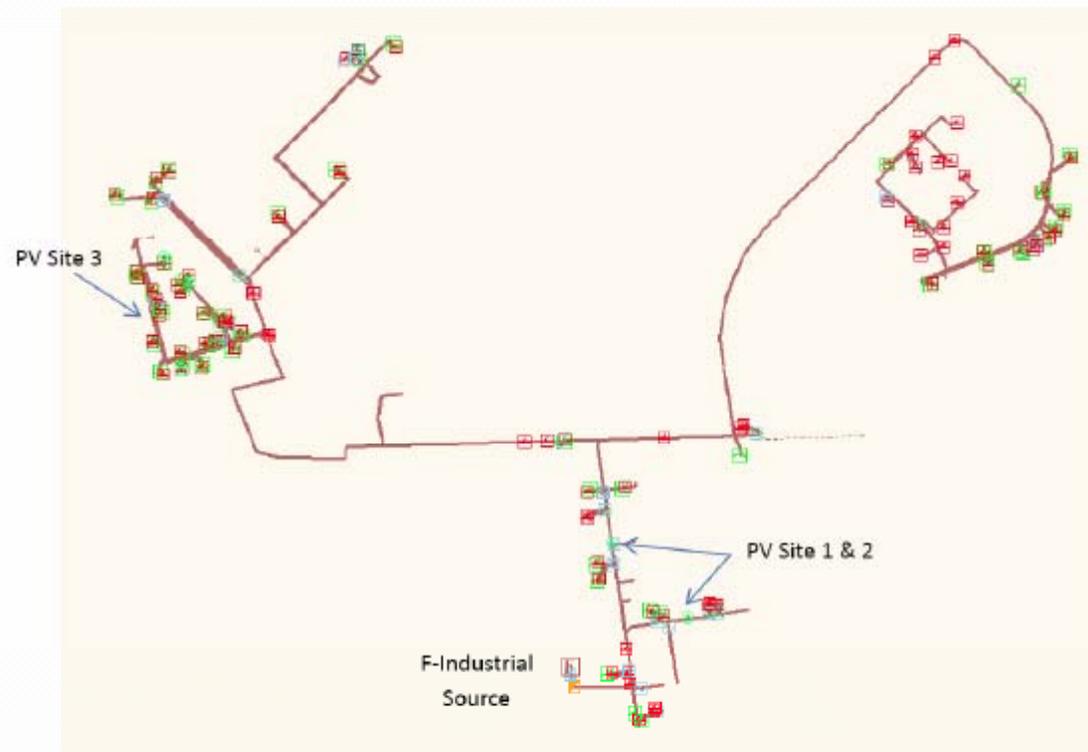
# HECO I

This HECO site has a current penetration level of 24.50% of peak load with almost 900 kW of PV. The PV installations on this circuit are comprised of a mix of industrial and residential customers over a relatively long distribution feeder.



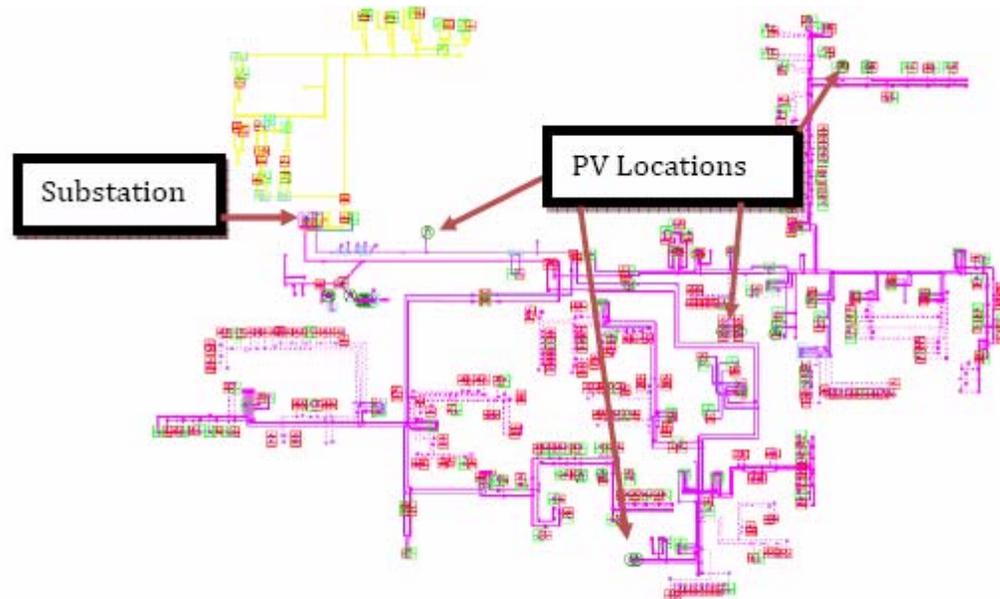
# HECO 2

This HECO site has a current penetration level of 21.90% of peak load with 1147 kW of PV. This circuit consists mainly of industrial customers. Due to the high peak load penetration value, with businesses active mainly during the day, the circuit penetration level during off-hours may be significantly higher, especially on weekends.



# HELCO

The HELCO project will model the M substation area where there are four circuits. M Circuit 1 has an existing circuit penetration level of 8.6% with 260 kW of installed PV to circuit peak load. M Circuit 3 has an existing circuit penetration level of 10% with 408 kW of PV. These two circuits serve the resort hotels and residential area of the M substation area. M Circuit 4 serves a large pumping load, with no PV. M Circuit 2 is designated to serve a new development that plans to include high levels of PV as it builds out. M Circuit 2 is not serving loads at this time.



# MECO

The MECO Site (Site 10) has a current penetration level of 6.34% of peak load with approximately 176 kW of PV. The PV installations on this circuit are comprised of a mix of commercial and residential customers over a relatively long distribution feeder.

