GPG FINDINGS **046**

JANUARY 2021

SUBMETERS AND ANALYTICS: SINGLE-CIRCUIT METER

OPPORTUNITY

Why is GSA interested in submetering and analytics?

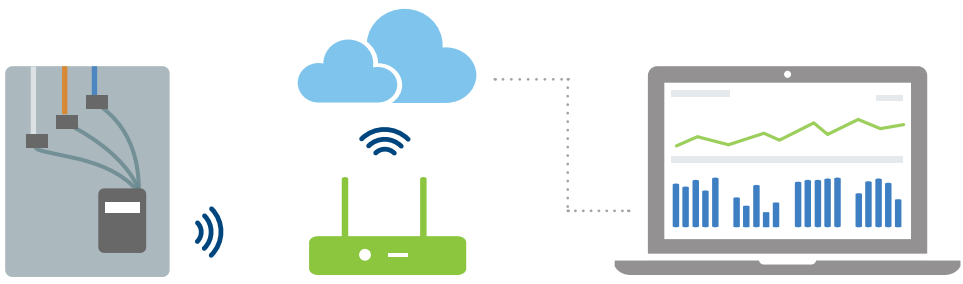
- TENANT OR EQUIPMENT-LEVEL BILLING
- FAULT DETECTION & DIAGNOSTICS (FDD)
- IDENTIFY ENERGY CONSERVATION MEASURES (ECMS)

TECHNOLOGY

What are single-circuit meters?

MONITOR SINGLE OR 3-PHASE CIRCUITS INCLUDING PANEL MAINS

Combines a meter, a wireless communication gateway that collects data from multiple meters, non-proprietary current transformers and cloud-based analytics



M&V

Where did Measurement and Verification occur?

NATIONAL RENEWABLE ENERGY LABORATORY (NREL) assessed single-circuit meters at the Cesar Chavez Memorial Building in Denver, Colorado. Technology was provided by Meazon.

RESULTS

How did single-circuit meters perform in M&V?

<2% ERROR COMPARED TO REFERENCE

Captured load profile trends accurately, even for high-variability loads[1]

1 DAY INSTALLATION

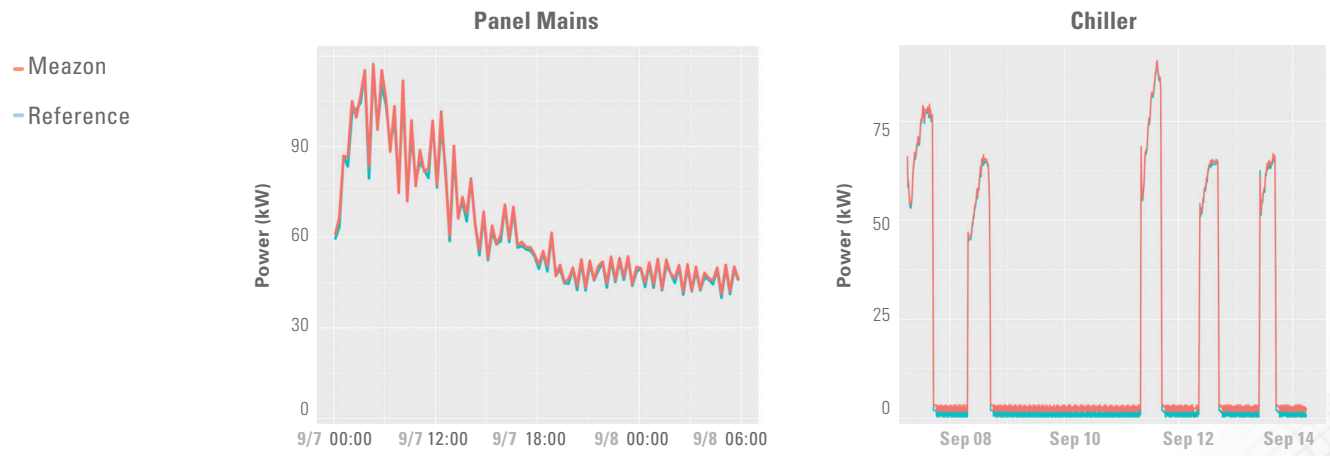
for 6 measured loads; $470 equipment and $431 installation per load; equipment bulk purchase estimate $132/load.[2]

FDD/ECM

Provides basic fault-detection and energy conservation measures for facilities without a BAS; can also be integrated into GSA's smart building platform, GSALink.[3]

Accurately Tracks Energy Consumption

<2% measurement error, except when chillers were online but idling[4]



DEPLOYMENT

Where does the study recommend deploying single-circuit meters?

TENANT BILLING

Most value for monitoring devices with high power consumption.

Low-cost submetering can also provide FDD for facilities without GSALink and support ECM identification and M&V.

[1]Case Study: Field Evaluation of a Low Cost Circuit-Level Electrical Submetering System, Willy Bernal Heredia, Dylan Cutler, Jesse Dean (NREL), January 2021, p.23 [2]Ibid, p.25 [3]Ibid, p.29 [4]The decrease in measurement accuracy for low-power loads is consistent with previous GPG submetering evaluations. New meter design & high accuracy CTs may mitigate measurement errors for low-power loads.