



ELECTRIC SAMPLE FORM 79-1178
PLUG-IN ELECTRIC VEHICLE SUBMETERING PILOT PHASE 2
SUBMETER MDMA REGISTRATION AGREEMENT

Sheet 1

**Please Refer to Attached
Sample Form**

PLUG-IN ELECTRIC VEHICLE SUBMETERING PILOT PHASE 2

Submeter MDMA Registration Agreement

1.0 Instructions for Qualifying as a Submeter Meter Data Management Agent

Background

On November 19, 2013, the California Public Utilities Commission (Commission or CPUC) issued Decision (D.)13-11-002 modifying the PEV Submetering Protocol requirements set forth in D.11-07-029 by adopting the Commission Energy Division (ED) Staff's Plug-In Electric Vehicle Submetering Roadmap for a two-phase pilot. Resolution E-4651, dated June 26, 2014, requires the investor-owned utilities (IOUs) to submit a Phase 2 Tier 2 Advice Letter that includes the metering requirements provided by the ED to the IOUs, draft versions of the data format template, the Submeter Meter Data Management Agent (MDMA) Registration Agreement (RA), the customer enrollment Agreement, and MDMA Service Requirements.

Submeter MDMA Registration Process

Submeter MDMA Registration for the Phase 2 Pilot will be a two-step process:

Step 1:

All Submeter MDMA's desiring to participate in the Phase 2 Pilot must complete and submit the attached Submeter MDMA Registration Agreement to the Commission's Energy Division's (ED), Melicia Charles, to receive preliminary approval to participate in the Phase 2 Pilot (Note: Electronic signatures will not be accepted on the Submeter MDMA Registration Agreement (RA).)

Submeter MDMA's must indicate the following in the RA: (1) the number of submeters associated with customers that have agreed to participate as of the date they submit the RA and (2) the total number of submeters that they plan to enroll. The Phase 2 Pilot starts on January 16, 2017, and ends on April 30, 2018. Any individual customer participant may only participate for a maximum of 12 billing cycles.

The Commission may require that potential Submeter MDMA's comply with certain Energy Division standards in experience, education and training to perform the functions of a Submeter MDMA. These functions and associated requirements are described in detail in the Phase 2 Performance Standards for Metering and Meter Data Agents Participating in California's Electric Vehicle Submetering Pilot (Performance Standards), and attached hereto as Attachment 1.

The Energy Division will review the submitted documentation, determine if the prospective Submeter MDMA standards meet the requirements established by the Commission, and notify the Submeter MDMA whether its request is preliminarily approved via e-mail. The determination is based on the Energy Division's review of the Submeter MDMA's written, completed application and documentation. The Energy Division will make reasonable efforts to review the documentation and respond to the Submeter MDMA request within five business days. Missing documentation may require the prospective Submeter MDMA's to resubmit that portion of the application and restart the five business day review process. The Energy Division may also request additional information, as needed, to provide preliminary approval of the MDMA's registration request to participate in the Phase 2 Pilot.



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Submeter MDMA Registration Agreement

Step 2:

Final approval to act as a Submeter MDMA in each IOU's territory will be granted by the IOU to Submeter MDMA's that satisfy the requirements established in the MDMA Performance Standards, Attachment 1, and the ability to meet the IOU's EV Submeter Pilot Phase 2 Data Reporting and Transfer Requirements (Data Exchange Requirements), attached hereto as Attachment 2.

Several requirements must be met prior to the start of the Phase 2 Pilot on January 16, 2017, for Submeter MDMA's to receive final approval to participate in the Phase 2 Pilot. Note that some of the requirements may differ among the three IOUs. The requirements include but are not limited to:

1. Certifying Phase 2 Submetering MDMA equipment to Underwriters Laboratories (UL) standards by an Occupational Safety & Health Administration (OSHA)-approved Nationally Recognized Testing Laboratory (NRTL).
2. Providing each IOU with documentation of compliance with the EV Submeter Pilot Phase 2 Performance Standards for Metering and Meter Data Management Agents in general and the results of accuracy testing specifically for each submeter model type.
3. Passing the interval usage submeter data transmittal tests for each IOU in whose territory the Submeter MDMA has chosen to participate. (Note: Upon receipt of the Submeter MDMA's Registration Agreement, each IOU will electronically forward a copy of its data exchange requirements to the Submeter MDMA.
4. Providing each IOU in whose territory the Submeter MDMA has chosen to participate the required information to set up Submeter MDMA payments (i.e. vendor establishment, purchase orders).
5. Enrolling as an IOU customer in each IOU in whose territory the Submeter MDMA has chosen to participate if an MDMA elects to provide services as a Multiple Customer-of-Record (MCOR) customer.

Enrollment

1. The Submeter MDMA must submit a completed Single Customer-of-Record Customer Enrollment Agreement (Form xxx) or a Multiple Customer-of-Record Enrollment Agreement Form (XXX) for each participating customer (CEA). Such enrollments must be received by the IOU at least 5 business days prior to the start date of the customer's next billing cycle to become effective on that date, unless the volume of customer agreements in process at that time exceeds an average of five (5) agreements per business day over any five (5) business day period, in which case the enrollment will become effective at the beginning of the customer's subsequent billing cycle.
2. The enrollment period is for the first 3 1/2 months of the Phase 2 Pilot, January 16, 2017 – April 30, 2017 or until the maximum of 500 submeters is reached, whichever is earlier (Enrollment Period). Only 100 of the total 500 submeters may be related to NEM accounts. For the first 1 1/2 months of the Enrollment Period (Exclusivity Period), each Submeter MDMA will have "Exclusivity Rights" to enroll a pre-determined number of submeters into the Pilot. This number will be determined by dividing the Pilot's enrollment cap of 500 by the number of Submeter



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Submeter MDMA Registration Agreement

MDMAs participating in the Pilot. Exclusivity Rights expire at the end of February 2017, which is followed by the first-come, first-served Open Enrollment Period for two months ending April 30, 2017, or once 500 submeters have been enrolled, whichever is earlier.

3. During the Open Enrollment Period, utilities will notify Submeter MDMAs of remaining submeters available via email by Wednesday of the following week.

Submeter Testing and Calibration

1. Submeter MDMAs must provide each IOU with documentation of compliance with the EV Submeter Pilot Phase 2 Performance Standards for Metering and Meter Data Management Agents in general and the results of accuracy testing specifically for each submeter model type.
2. Nexant or another independent evaluator may randomly field test no more than five percent of the submeters for accuracy.

Submeter Safety Requirements

Any Electric Vehicle Supply Equipment (EVSE), EVSE with embedded submeter, and/or stand-alone submeter installed prior to the Phase 2 Pilot must have been certified by an Occupational Safety & Health Administration (OSHA)-approved Nationally Recognized Testing Laboratory (NRTL). Any EVSE, EVSE with embedded submeter, stand-alone submeter, except a plug-in EVSE or plug-in EVSE with embedded submeter, and related PEV charging circuits, must have been installed by a person or entity with a general electrical contractor's license issued by the California Contractors State License Board and obtained any required inspection and approval by the local Authority Having Jurisdiction (AHJ). The OSHA-approved list of NRTLs is maintained at: <https://www.osha.gov/dts/otpca/nrtl/>.

Any EVSE, EVSE with embedded submeter, and/or stand-alone submeter installed as part of the Phase 2 Pilot must be certified to Underwriters Laboratories (UL) standards by an OSHA-approved NRTL. Any EVSE, EVSE with embedded submeter, stand-alone submeter, except a plug-in EVSE or plug-in EVSE with embedded submeter, and related PEV charging circuits must be installed by a person or entity with a general electrical contractor's license issued by the California Contractors State License Board and must obtain any required inspection and approval by the local AHJ.

Data Format

Submeter MDMAs must satisfy the IOU's EV Submetering Pilot Phase 2 Data Reporting and Transfer Requirements, Attachment 2.

Data Format and Transfer Testing

After the IOU receives the completed preliminarily approved Submeter MDMA Registration Agreement from the Energy Division, the Submeter MDMA must complete an IOU specific Service Request to schedule the data format and transfer acceptance test to ensure the Submeter MDMA can produce a secure data file that satisfies the IOU's Data Exchange Requirements. To schedule the test, please contact the Submetering Pilot Project Lead at each IOU.

MDMA Data Responsibilities



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Submeter MDMA Registration Agreement

If the data that is made available to the customer through a web-based or mobile phone application or provided by the MDMA via customer request does not match the submeter data sent to the IOU then the MDMA must notify the customer of the discrepancy and explain the reason for the difference. The MDMA must also update the online data to accurately reflect the billing information sent to IOU prior to delivery of the IOU bill to the customer.

Security and Confidentiality

Submeter MDMA's must comply with data security and confidentiality requirements specified in the CPUC's Privacy Rules, PG&E's Electric Rules 9 and 27 and SCE's Electric Rule 25, and SDG&E's Electric Rule 33 (Protecting the Privacy and Security of Customer Usage Information). The Submeter MDMA's access to, use of, and disclosure of customer-specific energy usage and billing data is subject to the prior, express written consent of the participating customer and the sole responsibility of the Submeter MDMA.

VEE Performance Standards

For the purposes of the Phase 2 Pilot only, the usage measured at the EV submeter will be used to allocate energy usage between a primary load and electric vehicle load. IOU will accept the Submeter MDMA's data as being "valid" or VEE'd and bill both the EV and primary accounts accordingly. In addition, the Submeter MDMA is not required to satisfy the "Standards for Validating, Editing, and Estimating Monthly and Interval Data for Monthly and Interval Data" contained in "VEE-Attachment of the Direct Access Standards for Metering and Meter Data".

MCOR Submeter EVSP/MDMA Submeter Payment

If the MCOR Submeter EVSP/MDMA submeter payment does not include a list of all unique IDs and payment for each submeter, the IOU will apply payment to the accounts in accordance with payment processing policies.

Dispute Resolution

Submeter MDMA will be the single point-of-contact for all submeter data issues regardless of any agreement the Submeter MDMA may have with other organizations providing services on your behalf. The IOU will be the single point-of-contact for all IOU billing issues.

MCOR Submeter MDMA Payment Default

Payment default processes will follow each IOU's existing non-domestic collection path flow. In addition, the primary meter customer is simultaneously informed that thereafter, EV charging will be billed on the customer's primary meter rate. If the MDMA does not pay the closing bill, the amount due will be transferred to the primary meter customer's account.

Submeter MDMA Termination

IOU will notify Submeter MDMA if the Submeter MDMA fails to timely meet performance requirements for two consecutive billing periods. Absent corrective actions, if Submeter MDMA fails to timely meet performance requirements for a third consecutive month, IOU may petition Energy Division to terminate Phase 2 Pilot participation by Submeter MDMA and its customers.

Jurisdiction



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Submeter MDMA Registration Agreement

This agreement and the obligations to the parties under this agreement at all times shall be subject to the regulatory jurisdiction and supervision of the Commission and to such modifications as the Commission may direct from time to time in the exercise of its jurisdiction.

Indemnification

I, Submeter MDMA, hereby releases, holds harmless, and indemnifies the IOUs from any liability, claims, demands, causes of action, damages, or expenses resulting from my MDMA participation in the Phase 2 Pilot under this Registration Agreement.

[This Agreement must be signed by someone who has authority to financially bind the Submeter MDMA.]

Signature of Authorized Agent of Company

Submeter MDMA Company Name

Name of Authorized Agent of Company (Print)

Executed on (Date)

Phone Number

City and State Where Executed



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Submeter MDMA Registration Agreement

2.0 Submeter MDMA Registration Agreement

This registration is for Phase 2 only and expires on April 30, 2018.

Submeter MDMA NAME	Contact Person
Address:	Title
City, State, ZIP	Phone Number
Address	Email Address
Submeter MDMA's DUNS Number	

Check the box for each IOU the Submeter MDMA has selected to serve and provide estimates of the number of submeters including the total submeters across all chosen IOUs:

Pacific Gas and Electric

Number of submeters associated with customers that have agreed to participate:

Total number of submeters you plan to enroll and provide submetering services:

Total Submeter installations will be broken down as follows:

Residential:	Non-NEM	+	+ NEM	=	Subtotal	
		+		+		+
Commercial:	Non-NEM	=	+ NEM	=	= Subtotal	
	Subtotal	=	Subtotal	=	= Total	
Residential:	SCOR	+	+ MCOR	=	Subtotal	
		+		+		+
Commercial:	SCOR	=	+ MCOR	=	= Subtotal	
	Subtotal	=	Subtotal	=	= Total	



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Submeter MDMA Registration Agreement

Southern California Edison

Number of submeters associated with customers that have agreed to participate:

Total number of submeters you plan to enroll and provide submetering services:

Total Submeter installations will be broken down as follows:

Residential:	Non-NEM	<input style="width: 60px;" type="text"/>	+	NEM	<input style="width: 60px;" type="text"/>	= Subtotal	<input style="width: 60px;" type="text"/>
		+			+		+
Commercial:	Non-NEM	<input style="width: 60px;" type="text"/>	+	NEM	<input style="width: 60px;" type="text"/>	= Subtotal	<input style="width: 60px;" type="text"/>
		=			=		=
	Subtotal	<input style="width: 60px;" type="text"/>		Subtotal	<input style="width: 60px;" type="text"/>	= Total	<input style="width: 60px;" type="text"/>
Residential:	SCOR	<input style="width: 60px;" type="text"/>	+	MCOR	<input style="width: 60px;" type="text"/>	= Subtotal	<input style="width: 60px;" type="text"/>
		+			+		+
Commercial:	SCOR	<input style="width: 60px;" type="text"/>	+	MCOR	<input style="width: 60px;" type="text"/>	= Subtotal	<input style="width: 60px;" type="text"/>
		=			=		=
	Subtotal	<input style="width: 60px;" type="text"/>		Subtotal	<input style="width: 60px;" type="text"/>	= Total	<input style="width: 60px;" type="text"/>

San Diego Gas & Electric

Number of submeters associated with customers that have agreed to participate:

Total number of submeters you plan to enroll and provide submetering services:

Total Submeter installations will be broken down as follows:

Residential:	Non-NEM	<input style="width: 60px;" type="text"/>	+	NEM	<input style="width: 60px;" type="text"/>	= Subtotal	<input style="width: 60px;" type="text"/>
		+			+		+
Commercial:	Non-NEM	<input style="width: 60px;" type="text"/>	+	NEM	<input style="width: 60px;" type="text"/>	= Subtotal	<input style="width: 60px;" type="text"/>
		=			=		=
	Subtotal	<input style="width: 60px;" type="text"/>		Subtotal	<input style="width: 60px;" type="text"/>	= Total	<input style="width: 60px;" type="text"/>
Residential:	SCOR	<input style="width: 60px;" type="text"/>	+	MCOR	<input style="width: 60px;" type="text"/>	= Subtotal	<input style="width: 60px;" type="text"/>
		+			+		+
Commercial:	SCOR	<input style="width: 60px;" type="text"/>	+	MCOR	<input style="width: 60px;" type="text"/>	= Subtotal	<input style="width: 60px;" type="text"/>
		=			=		=
	Subtotal	<input style="width: 60px;" type="text"/>		Subtotal	<input style="width: 60px;" type="text"/>	= Total	<input style="width: 60px;" type="text"/>



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Submeter MDMA Registration Agreement

Total for all selected IOUs

Number of submeters associated with customers that have agreed to participate:

Total number of submeters you plan to enroll and provide submetering services:

Total Submeter installations will be broken down as follows:

Residential:	Non-NEM	<input type="text"/>	+	NEM	<input type="text"/>	= Subtotal	<input type="text"/>
		+			+		+
Commercial:	Non-NEM	<input type="text"/>	+	NEM	<input type="text"/>	= Subtotal	<input type="text"/>
		=			=		=
	Subtotal	<input type="text"/>		Subtotal	<input type="text"/>	= Total	<input type="text"/>
Residential:	SCOR	<input type="text"/>	+	MCOR	<input type="text"/>	= Subtotal	<input type="text"/>
		+			+		+
Commercial:	SCOR	<input type="text"/>	+	MCOR	<input type="text"/>	= Subtotal	<input type="text"/>
		=			=		=
	Subtotal	<input type="text"/>		Subtotal	<input type="text"/>	= Total	<input type="text"/>

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Attachment 1

Performance Standards for Metering and Meter Data Management Agents

1. STANDARDS FOR EV SUBMETERING

A. Physical Location

1. **Location.** The submeter must be located at any fixed point between the primary IOU electric meter and the electric vehicle supply equipment (EVSE) coupler. Any EVSE containing an embedded submeter must indicate that it contains a metering device.
2. **Identification.** Each submeter embedded in EVSE or standalone, must be labelled with or display a unique identifier associated with each EVSE coupler.
3. **Security.** A meter system shall be designed and constructed so that metrology components are adequately protected from environmental conditions likely to be detrimental to accuracy. Components shall be designed to prevent unauthorized access to adjustment mechanisms and terminal blocks by providing for application of a physical security seal or an Audit Trail.
4. **Security from Tampering and Diversion Resistance for Non-EV End-Uses.** During Phase 2 of the submetering pilot, no sealing requirements will be placed on the submeter, regardless of whether remote configuration is feasible. The Submeter Meter Data Management Agent and/or EVSPs should document how they physically prevent tampering of submeters. No means shall be provided by which any measured electricity can be diverted from the submetering device for non-EV charging end-uses.

B. Accuracy and Measurement

1. **Accuracy.** The submeter must demonstrate meter acceptance accuracy of +/-1%, and must maintain accuracy of +/- 2% during the second Phase of the pilot. The term 'accuracy' is equivalent to the same term used in the ANSI C-12 standard or equivalent to 'tolerance' in NIST Handbook 44 Section 3.40 T.2. Submeter MDMA is responsible for describing how they comply with this accuracy requirement prior to pilot installation.
2. **Interval of Measurement.** The submeter shall have the capability to measure energy consumption in time intervals equal to the interval used by the IOU, but submeters are not be required to measure energy consumption in intervals smaller than 15 minutes. A Submeter MDMA has the option to measure in less than 15-minute time periods if they choose to do so. Regardless of the submeter's measurement interval, the Submeter MDMA must report energy consumption data in time intervals consistent with those used by the IOU.
3. **Standard Time Synchronization.** The submeter's time shall be synchronized to the Universal Time Coordinate (UTC) time standard as defined by the National Institute of Standards and Technology (NIST), and shall be within +/- two (2) minutes of UTC, while the EVSE is in service. Submeter MDMA is responsible for describing how they comply with this accuracy requirement prior to pilot installation.

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Performance Standards for Metering and Meter Data Management Agents

4. **Unit of Measurement.** The submeter must measure electricity data to the nearest Watt-hour (Wh) for each time interval and must be time-stamped to indicate the time/date of the energy consumption.
5. **Submeter and MDMA Storage of Data.** The device memory shall retain information on the quantity of electricity consumed in event of a loss of external power or EVSE service outage. Values indicated or stored in memory shall not be affected by electrical, mechanical or temperature variations, radio-frequency interference, power failure, or any other environmental influences to the extent that accuracy is impaired per UL 2594. Submeter shall keep accurate time and have local storage sufficient to retain interval data while the EVSE remains in service, and data stored in device memory shall be retrievable by MDMA.
6. **IOU Storage of Data.** Watt-hour data accumulated and indicated shall be retained by the IOU consistent with the same data storage requirements applicable to customer billing data.

C. Safety

1. **Devices Installed Prior To Phase 2 Pilot.** Any Electric Vehicle Supply Equipment (EVSE), EVSE with embedded submeter, and/or stand-alone submeter installed prior to the Pilot was certified by an Occupational Safety & Health Administration (OSHA)-approved Nationally Recognized Testing Laboratory (NRTL). Any EVSE, EVSE with embedded submeter, stand-alone submeter, except a plug-in EVSE or plug-in EVSE with embedded submeter, and related PEV charging circuits, were installed by a person or entity with a general electrical contractor's license issued by the California Contractors State License Board and obtained any required inspection and approval by the local Authority Having Jurisdiction (AHJ). The OSHA-approved list of NRTLs is maintained at: <https://www.osha.gov/dts/otpca/nrtl/>.
2. **Devices Installed As Part Of The Phase 2 Pilot.** Any EVSE, EVSE with embedded submeter, and/or stand-alone submeter installed as part of the Phase 2 Pilot is certified to Underwriters Laboratories (UL) standards by an Occupational Safety & Health Administration (OSHA)-approved Nationally Recognized Testing Laboratory (NRTL) or meets IOU safety standards. Any EVSE, EVSE with embedded submeter, stand-alone submeter, except a plug-in EVSE or plug-in EVSE with embedded submeter¹, and related PEV charging circuits were installed by a person or entity with a general electrical contractor's license issued by the California Contractors State License Board and obtained any required inspection and approval by the local AHJ.

D. Informing Customers about Submeter Data

1. **MDMA Responsibilities.** There is no requirement for the submeter device to visually display data. Customers should be informed of this condition by the EVSP or Submeter MDMA. MDMA must make data available to customers through a web-based or mobile phone application and by request. If the submeter data that is made available to the customer through a web-based or mobile phone application or provided by the MDMA via customer request does not match the submeter data sent to the IOU then the MDMA



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Performance Standards for Metering and Meter Data Management Agents

must notify the customer of the discrepancy and explain the reason for the difference. The MDMA must also update the online data to accurately reflect the billing information sent to IOU prior to delivery of the IOU bill to the customer.

2. **IOU Responsibilities.** IOUs are required to report submeter data through the customer's monthly bill. The IOU is not required to report this usage data through their customer web tools. An IOU may opt to report data to customers online. Customers should be informed that the pilot is temporary and that the requirements may change after the end of the second pilot phase.

E. Transfer of Submeter Data from Submeter MDMA to IOUs

1. **Data Reporting and Transfer Requirements.** Please see requirements in Attachment 2 – to this Submeter MDMA Registration Agreement. Attachment 2 describes the data format and data transfer processes necessary for a Submeter MDMA participating in Phase 2 of the CPUC ordered EV Submetering Pilot.
2. **Transfer and Meter Data Synchronization Testing.** Submeter MDMA must demonstrate ability to transfer a test meter data file with interval data synchronized with IOU meter data, which can be successfully processed for subtractive billing by the IOU. The Transfer Testing may use the Minimum Transfer Requirement or the Alternative Transfer Requirement if offered by the IOU. Data transfer testing shall only be required during the MDMA registration process and thereafter as necessary to help ensure continuity of meter data file transfers.
3. **Process Updates.** IOUs may make periodic changes to the standard format for the MDMA to submit meter data. Submeter MDMA's may be required, at their cost, to make modifications and perform additional testing of their systems to support any changes required by the IOUs.

F. SUBMETER MDMA VEE PERFORMANCE STANDARDS

1. **MDMA Data Valid for Billing.** For the purposes of Phase 2 of the CPUC's EV submetering pilot, the usage measured at the EV submeter will be used to allocate energy usage between a primary load and an electric vehicle. The IOU will accept the Submeter MDMA's data as being "valid" and bill both EV and primary accounts accordingly.
2. **Submeter Data Delivery Deadlines.** The Submeter MDMA must provide all of its EV submeter data to the IOU within 3 calendar days of the IOU's regularly scheduled meter read date. Any submetered data submitted after 5:00 pm Pacific Time of the third calendar day will not be incorporated into the customer's bill. If data is not received for any submeter billed interval within this timeframe, that interval will be considered as "zero" by the IOU when calculating the primary and EV submeter monthly bills. The 3 calendar day standard may be met by providing submeter data throughout the course of the month (e.g. on a daily basis) if desired.

G. METER SYSTEM TESTING



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Performance Standards for Metering and Meter Data Management Agents

1. **Field Testing Sample.** An independent third party evaluator (3PE) will be allowed to field test up to 5% of the EV submeters within each of the IOUs service territories for each phase of the EV pilot to evaluate the accuracy of the overall metering system at a customer site. The 3PE shall be allowed to select which EV meters to test, and the Submeter MDMA and its customers' shall provide the necessary access and assistance to facilitate such testing.
2. **Field Testing Methodology.** The submeter MDMA's will propose methodologies for testing and calibration for IOU review, consent, and subsequent implementation.
3. **Submeter Manufacturer Certification & Accuracy.** EVSE providers shall provide the respective IOUs with documentation of their compliance with the EV Submeter Pilot Phase 2 Performance Standards for Metering and Meter Data Management Agents in general and the results of accuracy testing specifically for each submeter model type.



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Attachment 2

Data Reporting and Transfer Requirements

INTRODUCTION

This document is intended to describe the data format and data transfer processes necessary for a Submeter Meter Data Management Agent (MDMA) participating in Phase 2 of the CPUC ordered Electric Vehicle (EV) Submetering Pilot (Pilot). Submeter MDMA's are expected to meet certain performance standards in the EV Submetering Pilot¹, including transferring submeter data to the California Investor Owned IOUs (IOUs) for the purpose of Subtractive Billing. This document provides information on EV Submeter data formats and transfer method to be used in the Pilot.

Submeter MDMA's are expected to transfer Submeter Data to the IOUs using the Minimal Transfer Requirement. Details to implement the Minimal Transfer Requirement are the focus of this document.

Additional Submeter MDMA activities are beyond the scope of this document, such as the process for a Submeter MDMA to register with an IOU and to signup customers for the Electric Vehicle Submetering Pilot. These additional activities are referenced herein, but the details are outside of the scope of this document.

TERMS AND DEFINITIONS

CSV – Comma Separated Values. The spreadsheet file format used in the Minimal Transfer Requirement. It is also a format used for Green Button subscription files.

DUNS number - Data Universal Numbering System. A nine digit number assigned by Dun & Bradstreet unique to a single business entity.

NAESB - North American Energy Standards Board. NAESB is the standards organization that created the ESPI standard, which is used by Green Button.

UTC Time - Coordinated Universal Time (UTC). A signed positive 64 bit integer value representing the number of seconds from midnight Jan 1, 1970, in UTC, not counting leap second corrections to UTC (35 seconds through 2012). So 5:00 PM EDT on September 22, 2013, has a UTC Time value of 1379883600")

UUID - Universally Unique Identifier. UUID is used to identify entities such as Submeters.

DATA FORMAT

This section describes the data file format to be used in the Pilot. The data format available for this pilot is a spreadsheet file format.

SPREADSHEET DATA FORMAT

The Spreadsheet format is a simplified derivation of the Green Button XML format. The spreadsheet format allows Submeter MDMA's to transfer in one file EV Submeter data for multiple submeters and

¹ See: Phase Two Performance Standards For Metering And Meter Data Agents Participating In California's Electric Vehicle Submetering Pilot



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Attachment 2

Data Reporting and Transfer Requirements

multiple days. The spreadsheet does not include field headers. Fields are defined in the table below. The spreadsheet shall be transmitted in CSV file format, including carriage returns and line feeds.

Field Title	Field Description
Submeter UUID	Assigned by IOU after a Registered Submeter MDMA completes the Customer enrollment with the IOU.
Interval Duration	Duration of data interval for the Read Quantity represented in seconds. Interval Duration is either "900" for 15 minute intervals.
Interval Read Date & Time	Interval Read Date & Time for the start (using interval beginning time) of the data intervals. Interval Read Date & Time is expected to be on the quarter hour for 15 minute intervals (e.g., UTC Time equivalent of 10:15 am, 10:30 am, 10:45 am, and 11:00 am). An Interval Read Date & Time record is required for every interval every day, even when the Read Quantity is zero. (Formatted UTC Time, see terms and definitions)
Read Quantity	Interval value in Watt hours. (Formatted Decimal 12/6 with zero padding on the right, and none on the left)
Date Processed	Date the data was loaded into the spreadsheet by Submeter MDMA's. (Formatted UTC Time, see terms and definitions)

Below is an example of the spreadsheet file: (UTC Seconds in the example represent UTC Time)

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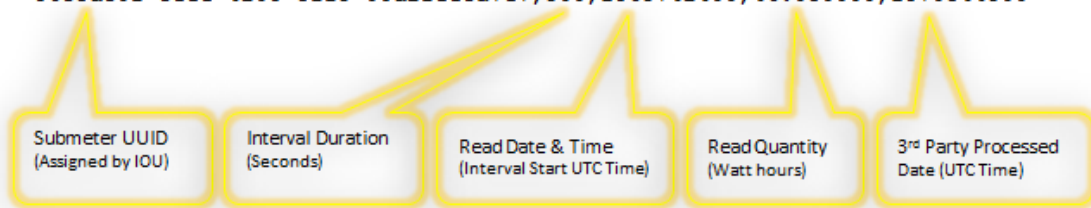
Attachment 2

Data Reporting and Transfer Requirements

```

36c8dc0f-ceee-4203-8ff9-05d2feeca7e7,900,1369728900,40.640000,1370844900
36c8dc0f-ceee-4203-8ff9-05d2feeca7e7,900,1369729800,41.120000,1370844900
36c8dc0f-ceee-4203-8ff9-05d2feeca7e7,900,1369730700,43.040000,1370844900
36c8dc0f-ceee-4203-8ff9-05d2feeca7e7,900,1369731600,41.280000,1370844900
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SPREADSHEET FILE MINIMUM DATA TRANSFER REQUIREMENTS

To facilitate data processing and possible data troubleshooting, minimum data transfer requirements are defined.

1. No partial day data will be processed by the IOU.
 - a. Spreadsheet files shall contain a minimum of 24 hours of interval data. (e.g., 96 consecutive intervals assuming 15 minute intervals.)
 - b. Spreadsheet files shall contain Interval Read Date & Time records for every interval, even when the interval's Read Quantity is a zero or a missing value.
 - c. Missing interval Read Quantities shall be represented with zero values.
 - d. IOUs expect 96 consecutive intervals in a day.
2. IOUs require daily file transfers.
 - a. Daily file transfers may contain multiple Date & Time records for multiple days.
 - b. Daily file transfers containing Date & Time records for multiple days, shall contain all expected consecutive intervals (e.g., no missing intervals or gaps in intervals)

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Data Reporting and Transfer Requirements

- c. Daily file transfers may contain repeated or corrected Date & Time records. IOU will use the most recently received and processed interval record(s), when billing the submeter data. IOU may not correct Date & Time records for intervals previously billed.
- 3. Date & Time records should not be delayed by more than three days. Records delayed by three or more days may not be processed for billing, due to the Pilot requirement that meter data is to be sent by 3 calendar days after the customer’s billing period.
- 4. File data should be ordered by Submeter UUID and Interval Read Date & Time to facility file troubleshooting and processing.

SPREADSHEET FILE NAME STRUCTURE

The CSV spreadsheet files transferred by the Submeter MDMA to IOU shall use the following file naming structure:

“MDMA-DUNS_IOU-DUNS_EVSP_YYYYMMDDHHMMSS.CSV”

File Name Component	Component Description
MDMA-DUNS	The nine digit DUNS Number of the Submeter MDMA registered with the IOU and provided to the IOU as part of the Submeter MDMA’s Registration process. (Format numeric 9, all formatting dashes omitted)
IOU-DUNS	The nine digit DUNS Number of the IOU and provided by the IOU as part of the Submeter MDMA Registration process. (Format numeric 9, All formatting dashes omitted)
EVSP	Hard coded “EVSP” to identify the file as part of the EV Submetering pilot application.
YYYYMMDDHHMMSS	The date and time the spreadsheet file was created by the Submeter MDMA, based on MDMA’s local time as determined by MDMA. Purpose of this file name component is to determine time sequence of files sent from an individual MDMA.
Example file name: “987654321_123456789_EVSP_20130428235959.csv”	



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Data Reporting and Transfer Requirements

PROVISION OF UUIDS TO SUBMETER MDMAS

The provisioning of UUIDs consists of transferring the Submeter UUIDs from the IOU to the Submeter MDMA. The Submeter UUIDs are assigned by IOU after the MDMA's approved registration into the EV Submetering Pilot, and after a Registered Submeter MDMA submits a valid Customer Enrollment form to IOU. The Submeter UUIDs may be sent by encrypted email from IOU to the MDMA or by the EVSP Enrollment report described below in section Enrollment and Exception Reporting to Submeter MDMAs.

The Customer UUIDs will be sent to the Submeter MDMA in a CSV file containing both the UUID and the corresponding Unique Submeter Device Identifier (aka, Submeter Serial Number) for the customer's service. See EVSP Enrollment Data Format below for more details.

DATA TRANSFER METHODS

The IOUs each have slightly different methods to send and receive Minimal Transfer Requirement spreadsheet files. This section describes those methods.

PACIFIC GAS & ELECTRIC (PG&E) DATA TRANSFER METHOD

PG&E uses ESFT to receive the Spreadsheet Format data files from MDMAs. For the Phase 2 pilot, PG&E will only support receiving the Spreadsheet format from MDMAs and only provide MDMAs enrollment files (no providing of Exception Reporting files for Phase 2).

PG&E's preference is for MDMAs to push data files to our hosted sFTP servers (Inbound) and to pull enrollment files from our SFTP servers (outbound).

Per PG&E's preferred method, PG&E will provide MDMAs the following information:

1. IP Address
2. Assigned Username
3. Password or log in key (for key connectivity)
4. MDMAs to provide PG&E:
 - a. Name, email, and telephone number of MDMA's connectivity contact person(s).
 - b. Filename(s)

If file encryption is required, PG&E will provide the MDMA with PG&E's PGP Public Key.

If necessary, PG&E can support pulling data files from MDMAs external servers (inbound) and pushing enrollment files to MDMA servers (outbound). To support this, PG&E will require the following information from the registered MDMA:



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Data Reporting and Transfer Requirements

Files Inbound to PG&E:

1. SSH2 RSA 2048-bit key. This is used for validating the sFTP Connection. PG&E does use passwords as an alternative.
2. Hostname / IP address
3. Download folder path
4. Filename(s)
5. Name, email, and telephone number of MDMA's connectivity contact person(s).

Files Outbound from PG&E:

1. Hostname / IP address
2. Username
3. Password (or log-in key will need to be exchanged)
4. Upload folder path
5. Name, email, and telephone number of MDMA's connectivity contact person(s).

If file encryption is required, PG&E will provide the MDMA with PG&E's PGP Public Key.

SAN DIEGO GAS & ELECTRIC (SDG&E) DATA TRANSFER METHOD

SDG&E uses sFTP to receive the Spreadsheet Format data files from MDMA's, and send Error and Exception files to MDMA's. SDG&E will require the following from the Registered MDMA:

Files Inbound to SDG&E:

- 1) SSH2 RSA 2048-bit key. This is used for validating the sFTP Connection. SDG&E does not use Passwords.
- 2) MDMA's IP address
- 3) Filename(s)
- 4) Name, email, and telephone number of MDMA's connectivity contact person(s).

Once SDG&E receives the items above, then SDG&E's Network Team will set up the internal Firewall to accept MDMA files. SDG&E will provide the MDMA with a sFTP logon ID and other Details to start Connectivity Testing.

Files Outbound from SDG&E:



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Data Reporting and Transfer Requirements

- 1) SSH2 RSA 2048-bit key. This is used for validating the sFTP Connection. SDG&E does not use Passwords.
- 2) Receive SDG&E's SSH Keys and IP address, one for testing and one for production.
- 3) Provide to SDG&E:
 - a. Server DNS, if possible one for testing and one for production.
 - b. Logon IDs for SDG&E, if possible one for testing and one for production.
 - c. Drop-off path for SDG&E, if possible one for testing and one for production.

If file encryption is required, SDG&E will provide the MDMA with SDG&E's PGP Public Key.

SOUTHERN CALIFORNIA EDISON (SCE) DATA TRANSFER METHOD

SCE will use FTP to receive the Spreadsheet Format data files from MDMAs, and send Error and Exception files to MDMAs.

Files Inbound to SCE:

SCE will require the following from the Registered MDMA:

- 1) SCE will use Password authentication for inbound sFTP file transfers. SCE will provide credentials to MDMA. SCE does use Passwords.
- 2) MDMA's IP address (Should be static IP)
- 3) Filename(s)
- 4) Name, email, and telephone number of MDMA's connectivity contact person(s).
- 5) Once SCE receives the items above, then SCE Team will set up the Firewall to accept MDMA files. SCE will provide the MDMA with a sFTP logon ID and other Details to start Connectivity Testing

Files Outbound from SCE:

Following information is required from MDMA for transferring outbound files (SCE to MDMA)

- 1) IP Address/Host
- 2) User/Password, if password authentication.
- 3) Drop off location (Directory)
- 4) Name, email, and telephone number of MDMA's connectivity contact person



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Data Reporting and Transfer Requirements

*If file encryption is required, SCE will provide the MDMA with SCE's PGP Public Key

ENROLLMENT AND EXCEPTION REPORTING TO SUBMETER MDMAS

Enrollment information and reporting of errors or exceptions in the submeter CSV Spreadsheet format from IOU to Submeter MDMA may be provided in CSV formats described below. These reporting CSV files will be transferred from IOU/IOU/SDG&E to the Submeter MDMA using the outbound Data Transfer Methods described above.

ENROLLMENT AND EXCEPTION REPORTING FILE NAME STRUCTURE

The CSV files transferred by IOU to Submeter MDMA shall use the following file naming structure:

"MDMA-DUNS_IOU-DUNS_EVSPENROLLMENTS_YYYYMMDDHHMMSS.CSV"

"MDMA-DUNS_IOU-DUNS_EVSEXCEPTIONS_YYYYMMDDHHMMSS.CSV"

See the Spreadsheet File Name Structure section above for additional description of the file name components.

EVSP ENROLLMENT DATA FORMAT:

Field Title	Field Description
Transaction Type	Valid values are: <ul style="list-style-type: none"> • "New Enrollment" • "Enrollment Termination" (Formatted alpha-numeric)
Submeter UUID	Assigned by IOU after a Registered Submeter MDMA completes the Customer enrollment with the IOU. The "New Enrollment" transaction file is the vehicle to initially transmit the UUID to the MDMA. Submeter MDMA will receive a Submeter UUID for every Unique Submeter Device Identifier.
Unique Submeter Device Identifier	The Unique Submeter Device Identifier (aka Submeter Serial Number on the Customer Enrollment Form) provided by the Submeter MDMA during the Customer enrollment process. This identifier is unique to each submeter and provided by the MDMA. This identifier is expected not to change during the Phase 2 pilot. In the event of a submeter replacement, MDMA shall report data for the replacement submeter using the previously assigned Submeter UUID. (Formatted numeric maximum 17 digits, starting with 010+unique digits, for example 010123456789)
Effective Date	First date IOU will accept Submeter data from the MDMA. (Formatted UTC Time, see terms and definitions)

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Data Reporting and Transfer Requirements

Termination Date	<p>Date of the last day the EV submetering data will be used for subtractive billing. A new enrollment will not have a Termination Data (blank field); an Enrollment Termination will have a Termination date. For the Phase 2 pilot an Enrollment Termination will be sent after the 11th billing month. MDMA are expected to submit to IOU an Enrollment Termination, in the event their customer discontinues Submetering service.</p> <p>(Formatted UTC Time, see terms and definitions)</p>
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EVSP EXCEPTION DATA FORMAT:

If the IOU processing the MDMA's submetering data detects an error or exception within the spreadsheet data file, the IOU, at its own discretion, may elect to provide the MDMA with an exception notice. One method of sending an exception notice from the IOU to the submeter MDMA is an Exception Data file in the following format:

Field Title	Field Description
Customer UUID	Assigned by IOU after a Registered Submeter MDMA completes the Customer enrollment with the IOU.
Originating File Name	CSV file name provided by the Submeter MDMA which generated the exception (formatted MDMA-DUNS_IOU-DUNS_EVSP_YYYYMMDDHHMMSS.CSV)
Date Processed	Date Processed by IOU. (Formatted UTC Time, see terms and definitions)
Exception Error	<p>A description of the error generated by the CSV file provided by the Submeter MDMA. Example exception-errors may include:</p> <ul style="list-style-type: none"> • Invalid Enrollment - Customer and/or Device Invalid. • Invalid Data - Negative Values not allowed. • Invalid Data - Partial Data Found. • Invalid Data - Data received that is before or after the enrollment. • Invalid Enrollment - Customer and/or Device Invalid. <p>(Formatted alpha-numeric, up to 255 characters)</p>