Modesto Irrigation District

Solar Photovoltaic Rebate Program Handbook

GET MPOWERED
MID Rebates for Renewables

Revised July 2011

Table of Contents

Introduction

Modesto Irrigation District's (MID) Solar Photovoltaic (PV) Incentive Programs provide financial incentives for the installation of grid-interconnected eligible solar PV systems. This handbook describes the requirements to receive incentives for qualified installations within Modesto Irrigation District's electric service territory.

The goal of this program is to support the growth and sustainability of the solar industry in California. MID's goals include the addition of 30 megawatt (MW) of new PV generation capacity between 2007 & 2017. Along with the renewable energy generation component, this program leverages the effectiveness of energy efficiency measures.

MID offers two incentive types:

- **Systems up to 30 kilowatt (kW)** are eligible for a one-time rebate incentive. Measured at DC_{PTC} (direct current – Pacific Test Conditions), the maximum PV system size is 30,000 watts (30 kW). Available to all MID electric customers.
- **Systems over 30kW** are paid per actual metered kilowatt-hour (kWh) of energy generated. Measured at DC_{PTC}, the maximum PV system size is 1,000,000 watts (1,000 kW). The Performance-Based Incentive (PBI) is available for existing MID commercial, agricultural or industrial electric customers. This program is not applicable to new construction.

Program Overview

MID's Solar PV Incentive Programs are part of a comprehensive statewide solar program created by Senate Bill 1. Senate Bill 1 (SB1)[1] establishes three goals:

- To install 3,000 megawatts (MW) of distributed solar PV capacity in California by the end of 2016,
- To establish a self-sufficient solar industry in which solar energy systems are a viable mainstream option in 10 years, and
- To place solar energy systems on 50% of new homes in 13 years.

The MID Solar PV Incentive Programs provide incentives for residential and non-residential customers for both new and existing structures. For all projects, energy efficiency, the expected performance of the system[2], as well as the design and installation of the system, will determine the incentive amount.

For systems up to 30kW, the incentive is paid once the system is installed, operational and has met all program requirements. For all larger systems, over 30kW, the incentives will be paid in up to eleven payments over ten years and is based upon actual production once the system is installed, operational and has met all program requirements. Systems approved after July 20, 2009 are subject to a

1 SB01(Murray), Chapter 132, Statutes of 2006, § 4, as codified in Public Resources sections 25780-25784.

2 Expected performance is the anticipated electrical generation over the life of the system and depends on equipment specifications including efficiency.

payment cap of 50% of project cost. Upon MID approval, the payment for the first year may be paid at 6 and 12-month intervals.

To qualify for an incentive, both the building and the installed PV system must meet the following program requirements included in this handbook:

- MID PV Reservation Request Form / Program Contract submitted must be the current version as posted on www.mid.org.
- Applicant must be in good financial standing with MID.
- The electrical service for the building must receive retail electricity distribution service at the site of installation from Modesto Irrigation District.
- The solar PV system must have a minimum capacity rating of 1 kW CEC-AC.
- Maximum system & maximum PV Rebate program PV size per customer not to exceed 1 megawatt. Customer is determined by MID Account Number, MID Meter Number and Federal Tax Identification Number(s).
- Landlords may apply for MID solar rebates if they and the tenant (MID customer of record) are in good financial standing with MID. The customer of record will receive all net metering and excess generation benefits. The landlord (purchaser) of the PV system will receive the MID rebate.
- Premises with multiple electric meters will be limited to one PV system per meter. MID will not increase transformer/service capacity to facilitate PV generation under this program.
- The solar PV system must be interconnected to the utility distribution grid and generate electricity to offset the end-use consumer's on-site electrical load.
- The solar PV system must be located on the same premises of the end-use consumer where the consumer's own electrical demand is located.
- Where multiple PV systems are installed, separate monitoring systems must be maintained for each installation.
- The solar PV system must use new certified components that have not been previously placed in service and are on the Energy Commission's list of eligible equipment.
- The solar PV system must come with a 10 year warranty to protect against defects and undue degradation of electrical output.
- The solar PV system must be installed and verified as specified in this handbook.
- The solar PV system is intended to stay in place for a minimum of 20 years.
- Sale and/or transfer of energy output to third parties is prohibited.
- Leased and/or performance based projects are not eligible for MID rebates.
- MID reserves the right to periodically review and make changes to rebate qualification standards and to determine final program eligibility.
- Projected MID incentives should not be itemized in the project cost. All documentation must be legible.

- MID will only accept the most current version of the Solar PV application. Please see www.mid.org to assure your application is the most current version.
- Solar installers must have an active "A" or "C-10" license to install solar PV system 20kW CEC-AC or greater. Acceptable licenses for all other systems include active "A", "C-10","B", or "C-46".
- Solar PV systems where MID has built and electrical line extension (MID Rule 15) to serve a new load within the last three years are not eligible for Solar PV rebates.
- Maximum system size for incentive cannot exceed 100% of historic annual usage or MID calculation of annual energy for new construction projects.

New residential and non-residential buildings must achieve energy efficiency levels substantially greater than the requirements of the current Building Energy Efficiency Standards Title 24[3], Part 6, also known as "Title 24" + 15% Modesto Irrigation District places great importance on ensuring that buildings, which qualify for an incentive under the Program, are as energy efficient as possible.

Applicants are strongly encouraged to contact Modesto Irrigation District to inquire about new construction energy efficiency rebates.

Existing buildings must also attend to energy efficiency. The minimal energy efficiency requirements include an energy audit or proof of Title 24 compliance, efficiency upgrades, and potential commitments to enact the upgrades. For large Non-residential projects, retro-commissioning may also be required.

The MID Solar PV Rebate program may be periodically evaluated and modified to ensure progress towards program goals. The evaluation may include:

- Comparing the expected energy performance of systems to the actual output
- Determining the cost-benefit profile of systems
- Assessing overall program progress towards meeting the installed capacity targets

In addition, an evaluation could include investigating risks to long-term achievement of expected performance levels, such as the effects of unforeseen shading or poor system maintenance, and identifying potential actions that would reduce those risks. Funding for the program is provided by Modesto Irrigation District ratepayers in accordance with the eligibility requirements established under SB 1.

3 These standards are specified in the California Code of Regulations, Title 24, Part 6, commencing with Section 100.

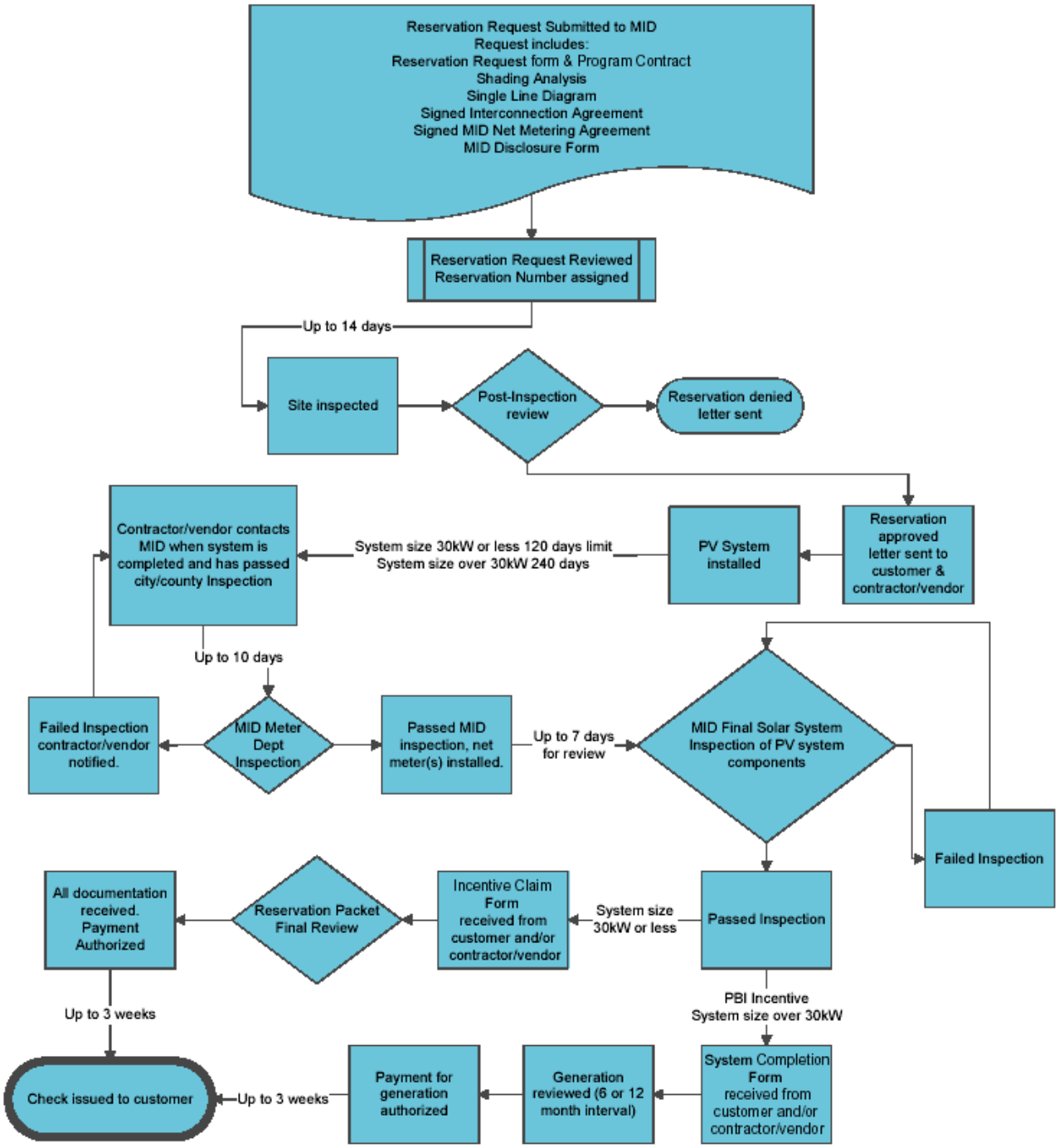
Summary of Program Requirements for All Project Types

Eligible Technologies	Solar PV Only
Eligible Customers	Modesto Irrigation District customers receiving retail electric distribution
Eligible Equipment	New, not previously placed in service, listed on the Energy Commission's Eligible Equipment List and certified by the Energy Commission.
Incentive Level Systems approved after July 20, 2009 are subject to a payment cap of 50% of project cost.	System up to 30kW, a one-time payment based on expected performance. For systems over 30kW, a Performance Based Incentive (PBI) will be paid annually over a 10 year period based on actual monthly kilowatt hour (kWh) production
Incentive Adjustment	Incentive declines annually (subject to available funding).
Verification	Systems and Energy Efficiency measures are verified.
Interconnection	System is grid connected with Modesto Irrigation District.

Additional Energy Efficiency Requirements by Project Type

Residential Retrofit	Energy Efficiency Audit or Proof of Title 24 Compliance within the past 3 years, disclosure, possible commitment to energy efficiency upgrades.
Residential New Construction	As qualified by the MID MPower New Home Construction Program. Must meet Title 24 requirements (Tier 1) + 15%. Homes that do not meet this requirement become eligible for incentive after the home has final permits and has been occupied for a minimum of 12-months. System sizing subject to MID approval.
Non-Residential Retrofit	Energy Efficiency Audit or Proof of Title 24 Compliance within the past 3 years and possible commitment to Energy Efficiency upgrades.
Non-Residential New Construction	As qualified by the MID MPower Business New Construction Program. Must meet Title 24 requirements + 15% where applicable (Provision of SB-1). Buildings that do not meet this requirement become eligible for incentive after the building has final permits and has had MID electric service for a minimum of 12-months. System sizing subject to MID approval. System sizing subject to MID approval. New construction/equipment not applicable to Title 24 must provide MID in writing information detailing that the new construction/equipment will exceed current energy efficiency standards for comparable industries prior to MID issuing any funding reservation. New construction/equipment where MID has extended primary power lines will not eligible for the MID Solar PV program.

Solar PV Program Flow Chart



Note: Effective Jan 1, 2011, the 6-month incentive for PBI Projects is no longer available.

Renewable Energy Credits/Certificates

As a condition of MID system interconnection, customer agrees that MID retains all rights and ownership to "renewable energy credits" (RECs) or certificates for greenhouse gas emissions and other future "renewable" and/or "environmental" credits or certificates for as long as the customer's PV system is interconnected to the MID distribution system. MID may trade and/or utilize these credits as deemed necessary and valuable for the benefit of all MID ratepayers.

Program Eligibility Requirements

This section covers eligibility requirements. Eligible PV systems must be permanently mounted and not to a mobile structure. In addition, the building permit for the solar system must be approved by the building code enforcement agency before any incentive payment is made.

Benefit to MID Customers

By providing the rebate incentive for solar PV, MID has the exclusive right to the output of the generation. Resale or wheeling of the generation to third parties is prohibited for the expected life of the incentivized PV project.

Technology and System Ownership

Eligible PV systems must be 1 kW AC (alternating current) or larger. It is the intent of the program that eligible systems remain interconnected to the utility distribution grid and be operated at the original location for their expected economic life. Systems must be owned by the Modesto Irrigation District's customer. *Power purchase agreements and non-owned systems are NOT eligible for an incentive.*

PV Sighting and Property Ownership

Eligible PV systems must be installed on the property that is owned by the MID Customer of Record.

Energy Efficiency

All existing buildings are required to conduct energy efficiency audits and document any energy efficiency measures installed or to be installed at a later date. The energy efficiency requirements for existing buildings are shown below:

The acceptable energy audit protocol consists of one or more of the following:

- On-line audit (residential only)
- On-site audit provided by Modesto Irrigation District (required for all non-residential services).
- Energy audit report summary completed during the past three years by Home Energy Rating Summary (HERS) from a certified HERS rater.
- Proof of Title 24 energy efficiency compliance within the past three years.

In addition to the Energy Audit, customer must identify the type of energy assessment tool or service used and which, if any, energy efficiency improvements

will be taken. If the improvements are to be installed after the installation of the solar system, the customer shall disclose the date the measures are expected to be installed.

Project Costs

Only those portions of a solar PV generating system that convert the energy source to electricity and the related power conditioning and control systems are eligible to be covered by the MID Solar PV Program. (All final project invoices must be itemized as a condition of the incentive).

Eligible costs include:

- Installation costs including any applicable license fees, permit fees and sales taxes
- Engineering costs and design, not to exceed 10% of total system cost
- The following specific components and equipment: The photovoltaic cells, modules, mounting or tracking structures, wiring, inverters, performance meters, foundation (for free-standing system) and utility-required interconnection equipment.

Ineligible costs include:

- Equipment for storage of the electricity produced (such as batteries)
- Cost of capital
- Cost of tools
- Tree trimming or other landscaping costs
- Roofing, re-roofing, roof repairs or reinforcement
- Relocating vent pipes, HVAC or other equipment
- New structures or reinforcement of existing structures for fixed array PV systems, with the exception of the racking and mounting components necessary for tilt or securing of the PV panels, with the sole purpose to elevate the arrays, or to serve as a multi-function structure such as covered parking

Other Incentives

Incentives received from sources other than the MID Solar PV Program that lowers the cost of the PV system may affect the incentive amount applicants receive. If incentives are from other utility incentive programs, a State of California sponsored incentive program, or a federal government sponsored incentive program (other than tax credits). These incentives will be deducted from the actual and documented Project Cost as it relates to the MID criteria and the maximum accrued rebate will not exceed 50% of net Project Costs. Applicants are required to inform the District of any other incentives for which they have applied and/or may receive.

Grid Interconnection

Qualifying PV systems must be grid-connected. This means that the PV system must be electrically connected (on the customer's property) to the MID electric system serving the customer's load. The interconnection of the customer's PV system must comply with all applicable electrical codes and MID interconnection requirements, MID Electric Service Rates and Rules. The PV system must offset the customer's energy use by supplying electricity otherwise supplied by MID. MID requires the installation of a visible, lockable disconnect switch to be installed between the PV system and the MID Distribution System. The switch must be clearly labeled "PV System Disconnect" and should be located on the alternating current (ac) side of the inverter and before and within 12 feet of the customers' service panel in a readily accessible location. PV equipment receiving program incentive is intended to be in place for the duration of it useful life. Systems must be secured to a permanent surface. Any indication of system portability may deem system ineligible for program incentives.

MID also requires the installation of a simple "A" Base Meter Socket Adapter on the alternating current side of the inverter. MID will install (at no cost to the customer) a utility grade meter that will allow the District to measure the generation output of the PV system.

System Components

All PV system components must be new and not have been previously placed into service at another location. All PV modules must be certified by a nationally recognized testing laboratory as meeting the requirements of the Underwriters Laboratory Standard 1703, and must appear on the latest California Energy Commission (CEC) certified Photovoltaic Modules list. All inverters must be certified as meeting the requirements of UL 1741 and appear on the latest California Energy Commission certified inverter list. The CEC list of approved modules and inverters can be found at: http://www.gosolarcalifornia.org/equipment/index.html.

The applicant must confirm that the components purchased for a system are eligible when applying for a reservation. Modesto Irrigation District or its agents will confirm that the equipment identified in a reservation package meets eligibility requirements prior to a reservation being granted. Because equipment is added and removed from the eligible equipment list on a regular basis, Modesto Irrigation District recommends the applicant wait for an approved reservation before installation commences. If the applicant begins or completes the installation before Modesto Irrigation District has approved the reservation, Modesto Irrigation District cannot be held responsible for any changes in incentive or eligibility.

Application for reservation must be received and approved prior to system interconnection.

System Performance Meter

MID requires the installation of MID performance (generation) meter measuring the alternating current output of the PV system.

System Sized to Offset On-site Electricity Load

Eligible systems must be sized so that the amount of electricity that is produced offsets part or all of the customer's electrical needs at the site of installation, not to exceed 100% of the expected electrical generation needs at the site of installation is eligible for incentives.

The annual on-site load in kilowatt hours (kWh) must be greater or equal to the annual estimated kWh for the proposed system as reported on the printout from the following calculator: www.csi-epbb.com.

In the case of existing loads, Customer Electrical Needs are defined as the 12-month kWh usage or the average annual kWh usage for the last two years. For new loads, Customer Electrical Needs (annual kWh) are determined by MID using Title 24 information, Energy Simulation software, or other like customer usage.

System Performance

The incentive amount will be either be based on the estimated performance of the solar system, Expected Performance Based Incentive (EPBI) or based on the actual performance of the system, Performance Based Incentive (PBI). For EPBI, the performance will be estimated using the California Solar Initiative Expected Performance Based Buydown (EPBB) incentive calculator (www.csi-epbb.com). The estimated performance of the system will be the basis for qualifying for a reservation, and for the final incentive amount. System installation should be consistent with the characteristics used to determine estimated performance to receive the reserved amount. The characteristics that are addressed by the EPBB Calculator include shading by any obstruction of the modules.

For PBI, incentive payments will be made based upon actual kWh generated.

System Installation

Systems must be installed in conformance with the manufacturer's specifications and all applicable electrical and building codes and standards[4]. If installed under contract, systems must be installed by an appropriately licensed contractor, in accordance with rules and regulations adopted by the California Contractors State License Board. Installation contractors must have an active A, B, C-10, or a C-46 license. Contractors with roofing specific licenses may place PV panels in accordance with limitations of their specific licenses; however, electrical connections must be made by an above-mentioned contractor. Owner-builders are allowed to install their own systems.

4 For information on restrictions placed on owner-builders, contact the Contractors State License Board at (800) 321-2752 to obtain a current edition of the Contractor's License Law and Handbook.

Modesto Irrigation District encourages installation contractors to become certified by the North American Board of Certified Energy Practitioners (NABCEP). See the NABCEP www.nabcep.org for additional information.

Field Verification

Upon receipt of a complete Request for Solar PV Payment Form and supplemental documents, the Applicant's project will be field verified by a Modesto Irrigation District representative.

Incentive payments are contingent on the field inspection visit and may be adjusted depending on the results of the field inspection. In all cases, the equipment indicated in the Solar PV Request for Payment form must match the equipment observed during the field verification process.

MID provides for some tolerances in system design as follows:

Inspection results	PA Action	Applicant Action	Failure
Results within set tolerance: Tilt ±5°, Azimuth ±5°, Shading ±5% of summer shading	Accepts submitted EPBB Calculator and initiates payment as normal	No Action Necessary	No
Results outside set tolerance, but within 5% of submitted incentive	Recalculate Incentive based on inspected EPBB calculator results. If new incentive is within 5% of submitted incentive, then notify Applicant of a new incentive amount change.	Applicant accepts the incentive amount change or disputes with PA for resolution	No
Results outside set tolerance and not within 5% of submitted Incentive.	Recalculate Incentive based on inspected EPBB calculator results. If new incentive is not within 5% of submitted incentive, then notify Applicant of a new incentive amount change and issue a Failure.	Applicant accepts the incentive amount change or disputes with PA for resolution	Yes

If a system fails a field inspection, the Program Administrator will notify the Purchaser with the reasons for the field inspection failure. Once notified, the Purchaser will either accept the failure and change in the incentive amount or dispute the inspection results.

If the failure is not corrected within 60 days, the project will be cancelled and the incentive forfeited.

The Program Administrators will also exercise their judgment in assessing fraud, which can occur due to gross negligence or intentional submission of inaccurate system information in an attempt to collect more incentive dollars. The responsible party will be immediately prohibited from participating in the program.

Warranty Requirements

All systems must have a minimum 10-year warranty provided in combination by the manufacturer and installer to protect against defective workmanship, system or component breakdown or degradation in electrical output of more than 10% from the originally rated electrical output during the 10-year period. The warranty must cover the solar generating system, including PV modules (panels), inverters, and trackers, and provide for no-cost repair or replacement of the system or system components, including any associated labor during the warranty period.

Incentive Levels and Structure

This section describes the incentives offered. The MID Solar PV Program provides an Expected Performance-Based Incentive (EPBI) using a specific dollar-per watt amount. The incentive amount for each applicant solar energy system is determined by analysis using the EPBB Calculator, and is paid when the solar system has been installed, approved by the local building authority, and all program requirements have been met. Incentives will decline over the life of the program, with the program's application process closing no later than the end of 2016. Incentive levels and reserved volume are subject to funding availability.

Incentive Amounts and Declining Schedule

Base Incentive

Expected Performance Based Incentives (EPBI) are available for systems 30kW or less. The actual incentive amount for a particular system and installation depends on the EPBI calculation of the system's expected performance compared to the reference system. Systems using trackers, either single or dual-axis, do not receive additional EPBI incentives even though the system will generate more kWh than a non-tracker system. Systems approved after July 20, 2009 are subject to a rebate payment cap of 50% of project cost.

Third-party field verification may be conducted to assess whether systems have been installed consistent with the characteristics used to determine estimated performance.

Performance Based Incentives (PBI) are available for systems over 30kW. The amount to be paid per kWh over the entire payment term is set once the reservation has been confirmed. Incentive declines occurring after a system has been reserved do not apply to reserved systems. This is to ensure proper funding for all installed systems. Systems approved after July 20, 2009 are subject to a rebate payment cap of 50% of project cost. PBI Payments will be based on actual kWh production. The payments will be paid annually for the 10-year payment term or until the payment cap has been met.

A project receives either EPBI or PBI, but not both.

Change in Incentive Level

Typically, the MID will make annual modifications to the PV Rebate Programs, but MID also reserves the right to update the MID website with solar program periodically. MID recommends interested parties periodically review the MID website for current incentive levels listed on MID's website at www.MID.org.

Once the Reservation has been approved, all program incentives and requirements in effect on the approval date of the applications will be in effect for the term of the reservation period.

Expected Performance-Based Incentive Calculation

The Program provides an incentive based on the expected performance (i.e., expected annual generated electricity), of a PV system installed in a specific location. The EPBI is determined by analysis using the www.csi-epbb.com tool. The analysis accounts for the tested and certified performance of the specific module and inverter, the mounting type and cell temperature, the orientation and tilt of the modules, and the extent to which the system is shaded. The PV calculator accounts for these parameters that are under the control of the installer, as well as the solar and climatic conditions for the locale of the building to determine the estimated performance over a year. The kilowatt-hour (kWh) production of an applicant system is compared to the kWh production of a reference system. The calculator establishes a performance ratio between the reference system and the proposed system. This ratio is known as the Design Factor. The maximum design factor for EPBI is 100%.

The calculator uses the reference system shown in the following table:

Reference PV System & Installation

Parameters	Reference System & Installation
Location	See EPBB User Guide (www.csi-epbb.com)
Azimuth	180◦ (South orientation)
Tilt	17◦
Shading	None
Default Efficiency	Setting to account for dirt, dust and mismatched wiring can be found on the PV User Guide at www.csi-epbb.com

Maximum Rebate and Other Incentives May Affect the Rebate Amount

Maximum PV rebate is limited to 50% of the project cost. Approved project cost details are discussed earlier in this document.

Incentives received from sources other than the MID Solar PV Rebate program that lowers the cost of the PV system may affect the incentive amount applicants receive.

If incentives are from other utility incentive programs, a State of California sponsored incentive program, or a federal government sponsored incentive program (other than tax credits), the rebate from MID will be reduced to ensure

the sum of all incentives received or expected from all sources, including MID's, does not exceed the total cost of the system. Applicants are required to inform the District of any other incentives for which they have applied and/or may receive.

Reservation Process

This section describes the process required to reserve funding from the Modesto Irrigation District Rebate program. A rebate acceptance letter provides assurance that reserved funds will be available when a request for payment is made.

Once the system owner has decided to install a solar system and has an executed contract with their system installer, the Reservation Application Package is submitted in the first step of the application process.

The following documents must be submitted with original signatures (as applicable):

- Application: Reservation Request Form & Program Contract
- Contract with Installer, Proposal or Letter of Intent to Purchase
- Interconnection Agreement with Modesto Irrigation District
- Net Metering Agreement with Modesto Irrigation District
- Energy Efficiency Audit report that includes recommendations for energy efficiency improvement. (see MID Energy Efficiency Disclosure form)
- EPBB Calculator printout (from www.csi-epbb.com)
- Site Plan/Roof Plan
- Single Line Diagram that includes placement of AC and DC disconnect switches, inverter(s) and meter sockets
- Detailed utility interconnection point/s and metering drawing for PV systems 10 kW or greater
- Cut sheets for panels and inverters

Once the reservation request is approved, the Program Administrator will issue ah acceptance letter confirming the incentive amount and reservation expiration date. The system must be purchased, installed, and put into operation by the Reservation Expiration Date.

Expiration dates:

- 30 kW and less PV projects – 120 calendar day reservation period
- Greater than 30 kW PV projects – 270 day reservation period

Program reservations will be strictly enforced. PV systems must be purchases, installed and operational, and in compliance with all MID PV Program guidelines, within the reservation period.

Program Administrator may request documents that reflect a commitment to timely construction including:

- Grading Permit – if relevant
- Building Permit
- Single line PV system diagram
- Construction schedule for projects greater than 30 kW

Additional Information on Reservations

Funding is available on a first-come, first-served basis for applicants who submit complete and accurate applications. Only one reservation and one incentive payment will be allowed for the premise-service during the reservation period. Applicants will not be allowed to submit multiple reservation applications for the same residential dwelling unit, building or premise.

Incomplete Reservation Package Requests

If an application is found to require clarification, the Program Administrator will request additional information. **Applicants have 20 calendar days to respond to the clarification request with the necessary information. If after 20 calendar days the Applicant has not submitted the requested information, the application may be canceled.** Resubmitted application packages will be treated as new applications (i.e., all required documents must be resubmitted) and processed in sequence along with other new applications.

Applicants are strongly encouraged to keep copies of all applications and supporting documentation submitted to Modesto Irrigation District or its agents.

Where to Send Application Package

To submit application package, please send to the following:
Modesto Irrigation District
Attn: Solar Program Administrator
1231 11th St
P.O. Box 4060
Modesto, CA 95352-4060

Payment Process

This section describes the process required to claim an incentive for all program types. After the solar system is purchased, installed, and has received the Final Building Permit inspection, the Applicant will submit the following documentation to request their incentive payment:

- Solar PV Request for Payment Form completed with original signatures of Installer, Purchaser and Applicant (if other than Purchaser)
- Final PV itemized invoice showing all retail costs for purchase and installation (excluding MID PV Rebate). Invoices must be paid in full. All documentation must be legible.
- One time payments or accrued PBI payments does not exceed 50% of project cost.
- Copy of City or County Final Permit Inspection must be included.
- EPBB Calculator Printout (from www.csi-epbb.com if system has changed)

For more information on the above-referenced forms, please see section A below.

Although the Applicant is not required to submit Proof of Authorization to Interconnect to the utility grid, Modesto Irrigation District will verify interconnection prior to payment of the incentive.

If incomplete, Modesto Irrigation District will request further information from applicant. If project has been deemed ineligible, Modesto Irrigation District will send notice of ineligibility. If system has been approved by Modesto Irrigation District, an EPBI incentive payment will be issued. For PBI projects, Modesto Irrigation District enters customer into PBI payment process for the specified payment period.

Incentive Claim / System Completion

Solar PV Incentive Claim Form (Non-PBI systems)

The Solar PV Incentive Claim Form must be completed and submitted prior to the reservation expiration date.

- Any changes to the information provided on the previously submitted Reservation Application, such as the use of different equipment, a different installer or a different equipment seller, must be noted in the space provided. If additional space is needed to note such changes, additional pages may be attached.
- Projected MID incentives should not be itemized in the project cost. All documentation must be legible.
- MID requires final, itemized PV project invoice(s) and all required documentation be submitted to MID immediately upon project completion (Project is completed upon interconnection with MID electric grid).

- If invoice(s) and/or required documentation is not received as detailed above, the Applicant will be required to submit a new Reservation Request at the current incentive rate.

Solar PV System Completion Form (PBI systems)

The Solar PV System Completion Form must be completed and submitted prior to the reservation expiration date.

- Any changes to the information provided on the previously submitted Reservation Application, such as the use of different equipment, a different installer or a different equipment seller, must be noted in the space provided. If additional space is needed to note such changes, additional pages may be attached.
- Projected MID incentives should not be itemized in the project cost. All documentation must be legible.
- MID requires final, itemized PV project invoice(s) and all required documentation be submitted to MID within 45 days of project completion (Project is completed upon interconnection with MID electric grid).
- MID will not begin accruing generation output for incentive payment until invoices and/or documentation is received.
- If invoice(s) and/or required documentation is not received as detailed above, the Applicant will be required to submit a new Reservation Request at the current incentive rate.

Documentation Confirming Payment

Modesto Irrigation District reserves the right to conduct spot checks to verify that payments were made as identified in the final invoices or agreements provided by equipment sellers and/or installers. As part of these spot checks, Modesto Irrigation District may require applicants to submit copies of cancelled checks, credit card statements, or equivalent documentation to substantiate payments made to the equipment seller and/or installer. (When submitting this documentation, applicants are encouraged to remove their personal account numbers or other sensitive information identified in the documentation.) Applicants must explain the difference if the final amount paid by the Applicant is different from the amount of the purchase or installation shown in the Request for Payment form.

Final Building Permit and Final Inspection

Applicants must submit a copy of the building permit and the final inspection signoff for the system installation prior to the expiration date of the reservation. The builder name and address on the final building permit and final inspection signoff must match the name and address shown on the Request for Payment Form.

Expected Performance Based Incentive (EPBI) Documentation

A copy of the EPBB calculator printout is only required if any aspects of the system have changed since the confirmed reservation that would result in a change in the Reservation Confirmation incentive amount. This new printout must reflect the system as installed and claimed on the Request for Payment Form.

Payment Claim Submission

Applicants must mail the complete payment claim package to Modesto Irrigation District on or before the expiration date specified on the Reservation Confirmation. Payments will be provided for each payment claim package submitted. Payment claims may be made for individual buildings or groups of buildings. Reservation-holders are not required to have completely installed all systems in their reservations before submitting a payment claim package.

Applicants are strongly encouraged to keep copies of all documents submitted in the payment claim package.

If the payment claim package is incomplete, Modesto Irrigation District will request the Applicant to provide all missing or unclear information; the Applicant will be responsible for obtaining missing or revised information from the equipment seller or installer to process the request. Modesto Irrigation District will allow the Applicant up to 60 days to respond with corrections to all the missing or unclear information to approve payment. If the claim is made after the expiration date of the reservation or is otherwise ineligible, the Applicant may reapply for a rebate reservation but will be subject to the program eligibility requirements, incentive levels, and funding available at the time of the reapplication.

Claiming an Incentive Payment without a Prior Reservation

In order to receive an incentive payment from Modesto Irrigation District, the system must have an approved reservation prior to system interconnection. Any system that has been interconnected prior to receiving a reservation confirmation is ineligible for incentive payments.

Appendix

Frequently Asked Questions

Can My Installed System Be Different Than My Reservation?

Modesto Irrigation District expects a system to be installed as described in the Application Form, but recognizes that changes may occur during installation. Changes do not require prior approval, but must be documented on the Solar PV Request for Payment form and are likely to change the incentive amount. Changes that result in a lowering of the expected performance of a system, and thereby lowering incentive amounts are not a problem. However, any change that increases the expected performance of a system, and thereby increasing the rebate amount is subject to availability of funding. The payee may receive the incremental increase in the eligible rebate at the time the claim is received.

If any system change occurs or is determined by the field verification that decreases the expected performance below that used in the reservation, the rebate is based on the lower expected performance. If any system change occurs or is determined by the field verification that increases the expected performance above that used in the reservation, MID will pay based on the higher performance.

Can New PV Be Added to Existing Inverters?

Yes, so long as the following are met:

- New PV modules must be on the eligible equipment list
- Only if the existing system was paid an incentive in accordance to SB 1 and SB 1 guidelines.
- New equipment must meet the 10-year warranty requirements
- All current program and documentation requirements apply to the newly added equipment.

Can I Get a Time Extension?

A time extension may be granted on a case-by-case basis.

System Size Justification

This Appendix describes the method used to determine the maximum system size eligible for incentives from the program. Because the average annual residential electricity consumption in California is about 7,000 kWh/yr, systems that are 5 kW and under are automatically presumed in compliance with the maximum size limitation. In cases where the proposed system size is greater than 5 kW, the system must be sized such that the expected performance, defined as expected annual generation of the system, is no greater than 100% of the building's on-site estimated annual electricity consumption. For new construction, the applicant may submit either the estimated annual electricity consumption based on a detailed energy use calculation signed by a Certified Energy Plans Examiner (CEPE) or a letter from a qualified architect, engineer, or electrical contractor (C-10 licensed) licensed by the State of California detailing expected energy consumption. Modesto Irrigation District will use the expected system electricity production from the EPBI calculation and compare it to the expected energy consumption.

Size Requested	Annual Load (kWh) at Proposed Site	Load Justification Required	Required Action
Up to 5kW	Any	None	None
Over 5kW	Annual kWh on EPBB printout is less than Annual Load	None	None
Over 5kW	Annual kWh on EPBB printout is greater than Annual Load	Yes	Submit detailed calculations or letter from qualified entity

Maximum Rebate

Annual historical electrical usage for setting maximum PV rebate application size will be determined by the average of two years of electrical history, if available. One year history will be accepted on the condition that staff agrees that the usage is typical for home or business. Less than one year history, or new construction, will be determined by MID staff based on typical and similar homes and businesses, title 24 information and load data.

Maximum Rebate Application Formulas	
Array Type	**Formula**
Fixed Array	1700 kWh/kW/Year x PV system AC_{PTC}
Single Axis Tracking Array	2000 kWh/kW/Year x PV system AC_{PTC}
Dual Axis Tracking Array	2250 kWh/kW/Year x PV system AC_{PTC}

System sizing cannot exceed 100% of historical annual energy usage or MID calculation of annual energy for new construction projects.

Field Verification and Diagnostic Testing

Background

The MID Solar PV Program provides incentives to builders for installing high performance PV systems on energy efficient homes and businesses. Field verification must be conducted to ensure that the components of the solar system and its installation are consistent with the characteristics used to determine its estimated performance. Field verification is a value-added service that provides quality control and can protect the builder, contractor and supplier, and business or homeowner. Field verification is completed consistent with the procedures of Chapter 7 of the 2005 Verification and Testing Summary to the Program Administrator (if different) and Purchaser.

In cases of new construction, the applicant must provide to the installer and rater a site plan that for each lot:

- identifies the species of all pre-existing, planted and planned trees and the location and height of any structures which will be built on the lot and neighboring lots of the building with the solar system; and
- shows the bearing of the property lines and the azimuth and tilt or roof pitch of each PV array.

Relationship to Other Codes, Standards and Verification

The local jurisdiction must issue a building permit for the qualifying PV system, either as a separate permit or as part of the new residential building permit, and the PV system must meet all applicable electrical code, structural code and building code requirements. In addition, MID has standards regarding interconnection to

the electric grid and other matters. The field verification and diagnostic testing procedures described in this document do not substitute for normal electrical, structural or building plan check or field inspection nor do they substitute for field verification by MID regarding interconnection to the electric grid.

Field Verification Visual Inspection

The purpose of the visual inspection described in this protocol is to verify that the module and inverter specified in the EPBB Calculator printout is the same as the installed equipment. The inspector shall use binoculars or another means to view the installation without being required to get on the roof, and shall verify the models and numbers of modules against the Request for Payment form. The inspector may rely on photographic evidence provided by the installer on the models and numbers of modules, standoff distance and shading, but in the absence of such evidence, must rely on a conservative determination based solely on their own observation.

PV Modules

The PV installer and the inspector must verify that the same number of each make and model number of PV modules used in the expected performance calculations are installed in the field. The PV installer and inspector must also verify the module mounting type (flush mounted BIPV or rack mounted) and in the case of rack mounted modules, the standoff distance of the modules above the mounting surface.

Inverters

The PV installer and inspector must verify that the make and model of inverters used in the expected performance calculations are installed in the field.

Tilt and Azimuth

The PV installer and the inspector must verify that the tilt and orientation (azimuth) of the PV modules installed in the field match the values that were used to determine the expected performance of each solar system, within ± 5°. In some systems, PV modules may be installed in multiple arrays with different tilts and azimuths. In these cases the tilt and azimuth of each array must be verified.

Determining Tilt - The tilt angle of the PV modules is measured in degrees from the horizontal (e.g. horizontal PV modules will have a tilt of zero and vertically mounted PV modules will have a tilt of 90°). The tilt of the PV modules may be determined in the following ways:

Using the Building Plans **-** The as-built or construction drawings for the residential building will state the slope of the roof, usually as the ratio of rise to run. If the PV modules are mounted in the plane of the roof then the slope of the PV modules is the same as the slope of the roof. Table 1 may be used to convert rise to run ratios to degrees of tilt.

Conversion of Roof Pitch to Tilt	
The tilt in full degrees so as to match the inputs available on the EPBB calculator. Actual degrees have been rounded to the nearest whole digit.	
Roof Pitch (Rise:Run)	Tilt *(degrees)
2:12	10
3:12	14
4:12	18
5:12	23
6:12	27
7:12	30
8:12	34
9:12	37
10:12	40
11:12	43
12:12	45

Using a Digital Protractor - A digital protractor may be used to measure either horizontal or vertical angles. These devices when sighted up the slope of the PV modules from the ground will display the slope, relative to the horizontal.

Determining Orientation (Azimuth) - The convention that is used for measuring azimuth is to determine the degrees of angle clockwise from north, e.g., north azimuth is zero degrees, east is 90°, south is 180° and west is 270°.

The following methods may be used to determine the azimuth.

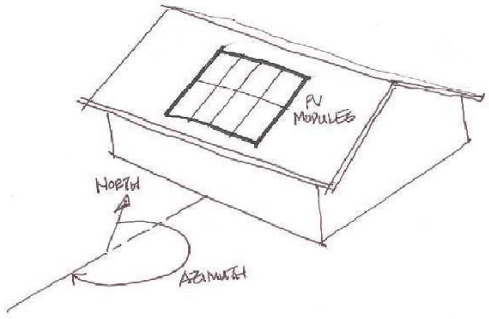
Using the Site Plans - In new subdivisions, the house plans will often not show the property lines since the plans are used on multiple lots. However, the subdivision plot plan will show the property lines of the lots. The plot plan will show the bearing of the property lines, and from this information the azimuth of the roof surfaces where the PV modules are mounted may be determined from the position of the house on the lot relative to the bearings of the property lines.

Using a Compass – Use a compass with a sighting feature and an adjustment for magnetic declination. Make sure that the compass has a sighting feature. The compass may have an adjustment built in for magnetic declination so that the reading on the compass is true north. If not, the magnetic declination may be found using the tool available at: [http://www.ngdc.noaa.gov/seg/geomag/jsp/Declination.jsp].

Adjust the compass reading to account for the magnetic declination. Position the compass and determine the array azimuth angle between compass north and the direction that the PV modules face. It's usually convenient and most accurate to align the compass along the edge of the array using the sighting feature.

Verifying Tilt and Azimuth for Systems Meeting the Flexible Installation Criteria -

Modesto Irrigation District allows determination of expected performance using the Flexible Installation criteria, which bases the estimated performance on an estimate of the performance for a range of module orientations and tilts. The Flexible Installation criteria applies to all solar systems that are installed with an azimuth ranging from 150° and 270° and all modules installed at the same tilt as the roof slope for roof pitches between 1:12 and 7:12.



Shading Verification

Shading conditions at the site must be consistent with those used in the EPBB Calculator printout. The estimated performance calculations will be done either assuming that the "minimal shading" criterion is met or based on the specific shading characteristics of each system and building.

The "minimal shading" criterion is that no obstruction is closer than a distance ("D") of twice the height ("H") it extends above the PV modules (see PV User's Guide found at the EPBB Calculator website www.csi-epbb.com). The distance "D" must be at least two times greater than the distance "H." Any obstruction that projects above any portion of the PV array must meet this criterion for the PV array to be considered minimally shaded. Obstructions that are subject to this criterion include:

- Any vent, chimney, architectural feature, mechanical equipment or other obstruction that projects above the roof of the residential building;
- Any part of the neighboring terrain that projects above the roof:
- Any tree that is mature at the time of installation of the solar system;
- Any existing neighboring building;
- Any telephone or other utility pole that is closer than thirty feet from the nearest point of the array.
- Obstructions that are located north of the array at azimuths between 305º and 55º from north relative to the most northerly points on the PV array need not be considered as shading obstructions. The PV installer and the program administrator / third party inspector may verify through visual inspection that most obstructions above the roof meet the 2:1 criterion. For obstructions that visual inspection indicates potentially do not meet the criterion, the PV installer and program administrator / third party inspector

must measure the height and distance of the obstruction(s) relative to the PV array as described above to verify that the 2:1 shading criterion is met.

Accounting for Actual Shading

When a PV installation does not meet the minimal shading criterion, it can still qualify for an incentive and participate in the program, but the shading conditions for each solar system at the site must be accounted for in the expected performance calculation as described in this section.

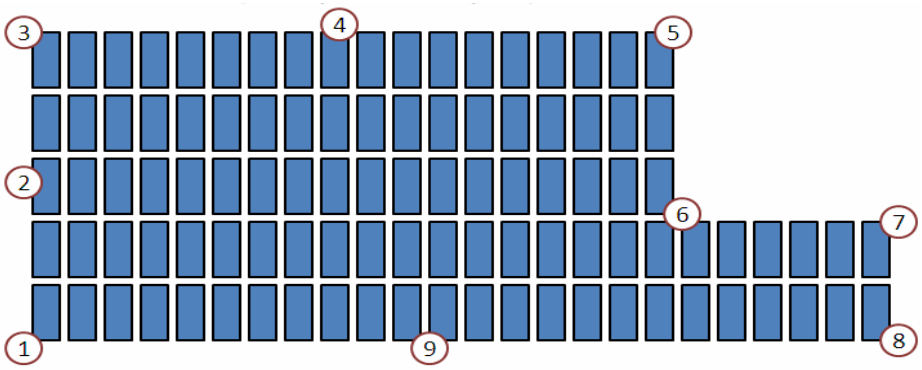
Measuring Shade Impact

One of the following procedures may be used to measure heights and distances or altitude angles to obstructions.

Using a Solar Assessment Tool – For shading from existing obstructions, such as neighboring buildings or other structures, terrain or already mature trees, on-site shading conditions can be verified using an instrument such as the Solar Pathfinder or SunEye. Follow the manufacturer's instructions carefully to ensure accurate readings.

The measurements shall be made at all the major corners of the array with no adjacent measurement being more than 40 feet apart (see example in figure below). The points of measurement shall be distributed evenly between two major corners if they are more than 40 feet apart such that the linear distance between any sequential points is no more than 40 feet. However, if any linear edge of the array has no obstructions that are closer than two times the height they project above the closest point on the array, then the intermediate measurements along that edge do not need to be made.

Example of Points where Measurements shall be made when using solar assessment tool (overall dimension 76' x 50')



Verification of System Performance

System performance verification is important to ensure all parties are receiving the proper benefits of the system.

For systems that have two or more strings connected in parallel to the same inverter, the following applies:

- Complete a visual check of the system to ensure the modules and all other system components are bolted securely, and all wiring connections have been made properly according to the system schematic, manufacturer's instructions, and applicable electrical code requirements.
- Check the polarity of all source circuits to be correct.
- The open circuit voltages of source circuits shall be tested and measured to be within 2 percent of each other.
- The short circuit currents shall be tested and measured to be within 5% of each other.
- Indicate on the Request for Payment form in the appropriate section that the above has been completed.

For systems that have only one string connected to a single inverter or for systems using micro-inverters, the following applies:

- Record Temperature and Irradiance as discussed below.
- Examine Field Verification Output (FVO) table (at end of section) for the percentage shown given the measured temperature and irradiance. Always round temperature up to the next block. So, 47° rounds up to 55° on the chart.
- Multiply the CEC-AC (from EPBB printout) times the FVO percentage to get estimated system output.
- Compare estimated system output with actual output. If actual system output is higher, system is operating within expectations. If estimated output is higher, perform additional diagnostics and correct any issues as the system may not be performing properly.
- Enter the appropriate values on the Request for Payment form.

Verification of system performance must be performed after the PV system is installed and connected to the electricity grid. Measurements must be made with a minimum irradiance of 300 W/m² in a plane parallel to the array. The PV installer and/or the program administrator / third party inspector must 1) measure the solar irradiance in a plane parallel to the array 2) measure the ambient air temperature. The PV installer or program administrator / third party inspector must then observe the output AC power displayed on the inverter and verify that the output AC power is at least the amount shown in the table for the field measured conditions. To qualify for the incentive, PV systems must have a performance meter or an inverter that has a built in meter that measures output AC power.

Measuring Solar Irradiance

Solar irradiance must be measured by using a solar pyranometer. When making this measurement, the PV installer or Program Administrator / third party inspector must place the pyranometer in a plane that is parallel to the PV modules. The PV installer should position the pyranometer on top of the PV modules or on the roof next to the PV modules. The Program Administrator / third party inspector who is not likely to be able to get on the roof must position the pyranometer such that it is in full sun and is in plane that is parallel to the PV modules. Digital protractors or other instruments may be used to properly position the pyranometer.

Measuring Ambient Air Temperature

Ambient air temperature must be measured with a digital thermometer in the shade. The instrument must have an accuracy of ± 2°C.

Observing Output AC Power at the Inverter

The PV installer and the Program Administrator / third party inspector must observe and record the reading within five minutes of the time the measurements of solar irradiation and ambient temperature were made. Note that the inverter may cycle between multiple readings (total kWh of production, output power, etc.), so the PV installer or program administrator / third party inspector will need to wait until the power is displayed and record this reading; several readings should be made to make sure that they are consistent and stable.

Multiple Orientation Arrays

For larger systems, PV modules connected to the same inverter may be installed with strings of equal numbers of modules connected in parallel in more than one orientation, each with its own tilt and azimuth (note that it is bad practice to install such strings in series or with a different number of modules in each string; either of these installations will lead to substantial reductions in performance). When strings are installed in multiple orientation arrays to the same inverter, separate EPBB Calculator printouts must be prepared for each orientation and solar irradiance must be measured separately in a plane parallel to each string that has a different azimuth and tilt. The expected output AC power is determined separately for each condition and the sum is used for verification purposes.

Field Verification Output (FVO) table

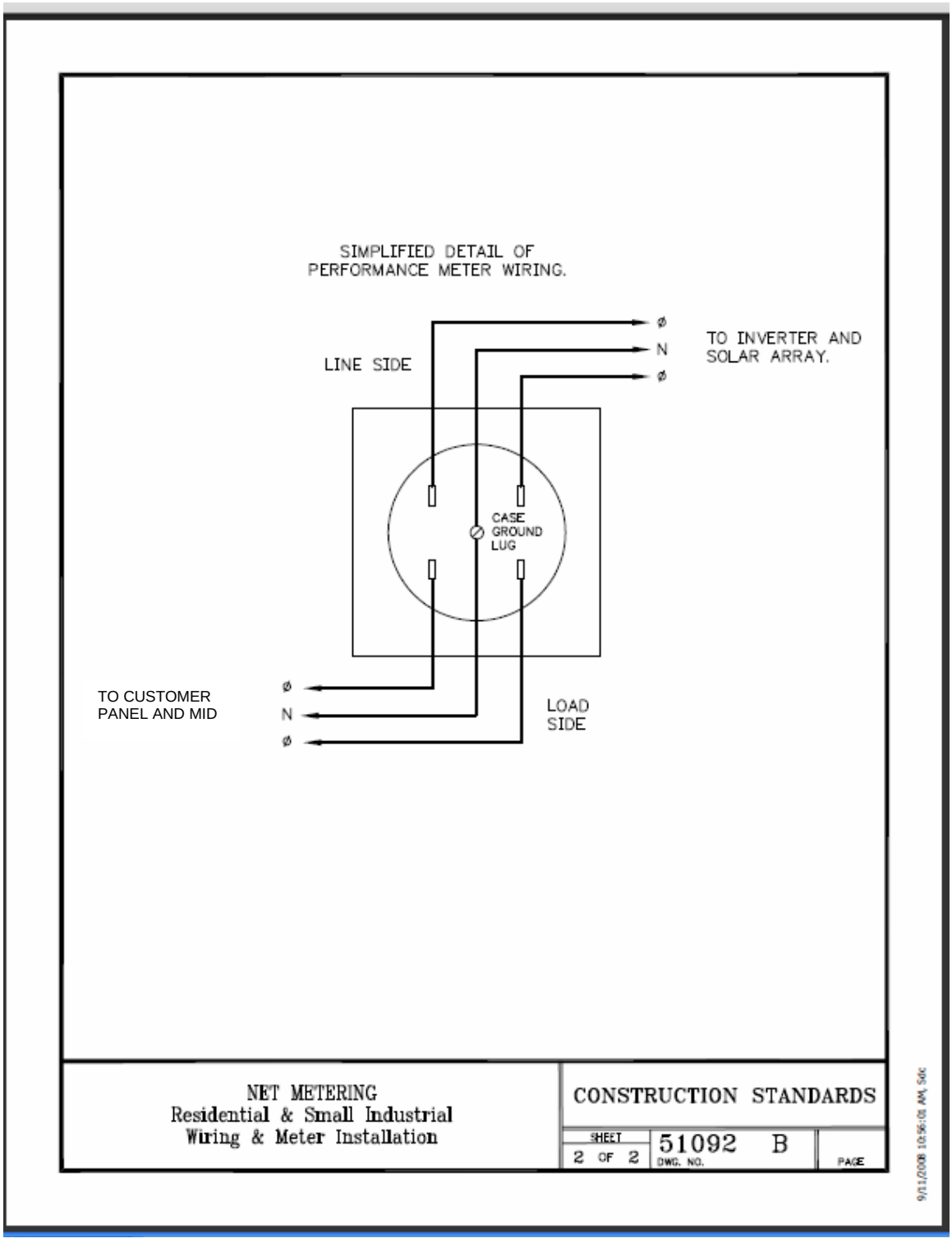
(W/m²)	T=15	T=25	T=35	T=45	T=55	T=65	T=75	T=85	T=95	T=105	T=115
300	26%	26%	25%	24%	24%	23%	22%	22%	21%	20%	20%
325	28%	28%	27%	26%	26%	25%	24%	24%	23%	22%	22%
350	31%	30%	29%	28%	28%	27%	26%	25%	25%	24%	23%
375	33%	32%	31%	31%	30%	29%	28%	27%	27%	26%	25%
400	35%	34%	33%	33%	32%	31%	30%	29%	28%	27%	27%
425	37%	36%	36%	35%	34%	33%	32%	31%	30%	29%	28%
450	40%	39%	38%	37%	36%	35%	34%	33%	32%	31%	30%
475	42%	41%	40%	39%	38%	37%	36%	35%	34%	33%	32%
500	44%	43%	42%	41%	40%	39%	38%	37%	36%	34%	33%
525	46%	45%	44%	43%	42%	41%	40%	38%	37%	36%	35%
550	48%	47%	46%	45%	44%	43%	41%	40%	39%	38%	37%
575	51%	49%	48%	47%	46%	45%	43%	42%	41%	40%	38%
600	53%	51%	50%	49%	48%	46%	45%	44%	43%	41%	40%
625	55%	54%	52%	51%	50%	48%	47%	46%	44%	43%	42%
650	57%	56%	54%	53%	52%	50%	49%	47%	46%	45%	43%
675	59%	58%	56%	55%	54%	52%	51%	49%	48%	46%	45%
700	61%	60%	58%	57%	55%	54%	52%	51%	49%	48%	46%
725	63%	62%	60%	59%	57%	56%	54%	53%	51%	50%	48%
750	65%	64%	62%	61%	59%	58%	56%	54%	53%	51%	49%
775	68%	66%	64%	63%	61%	59%	58%	56%	54%	53%	51%
800	70%	68%	66%	65%	63%	61%	59%	58%	56%	54%	53%
825	72%	70%	68%	66%	65%	63%	61%	59%	58%	56%	54%
850	74%	72%	70%	68%	66%	65%	63%	61%	59%	57%	55%
875	76%	74%	72%	70%	68%	66%	65%	63%	61%	59%	57%
900	78%	76%	74%	72%	70%	68%	66%	64%	62%	60%	58%
925	79%	78%	76%	74%	72%	70%	68%	66%	64%	62%	60%
950	81%	79%	77%	75%	73%	71%	69%	67%	65%	63%	61%
975	83%	81%	79%	77%	75%	73%	71%	69%	67%	65%	63%
1000	85%	83%	81%	79%	77%	75%	73%	70%	68%	66%	64%
1025	90%	85%	83%	81%	78%	76%	74%	72%	70%	67%	65%
1050	90%	90%	84%	82%	80%	78%	76%	73%	71%	69%	66%
1075	90%	90%	86%	84%	82%	79%	77%	75%	72%	70%	68%
1100	90%	90%	90%	86%	83%	81%	79%	76%	74%	71%	69%
1125	90%	90%	90%	90%	85%	82%	80%	78%	75%	73%	70%
1150	90%	90%	90%	90%	86%	84%	81%	79%	76%	74%	71%
1175	90%	90%	90%	90%	90%	85%	83%	80%	78%	75%	73%
1200	90%	90%	90%	90%	90%	90%	84%	82%	79%	77%	74%

Using the Field Verification Output Table

Example: 3.5 kW AC system measured at 65o F and with an irradiance of 900 watts/m2. The FVO shows 68%. So 3.5 kW x .68 (68%) = 2.38 kW. As long as the inverter output reads higher than 2.38 kW (2,380 W), the system is performing sufficiently.

Interconnection Diagrams

Please follow the MID guidelines for Net Metering as shown in the graphics below:



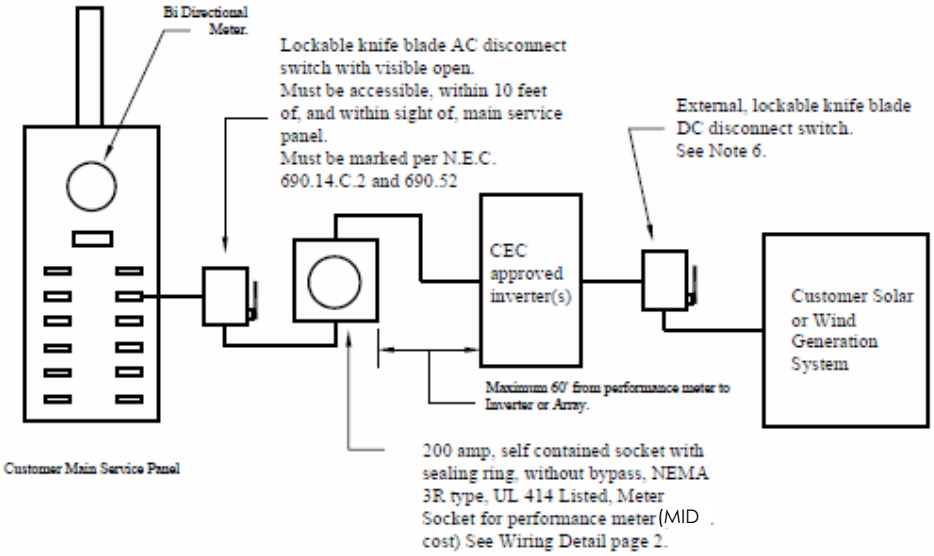


Figure 1 - Simplified Block Diagram of Net Metering Installation

1. Installation shall meet all applicable safety and perfromance standards established by the National Electric Code, the Institue of Electrical and Electronics Engineers, and accredited testing laboratories such as Underwriters laboratories, and wehre applicable, rules of the Public Utilities Commission regarding safety and reliability, as well as meet all MID requirements.
2. MID will ensure that the metering at the point of interconnection will accurately measure electricity flow in both directions. If replacement is necessary, the applicant shall be responsible for such cost.
3. Applicant shall make provision for installation of a MID meter dedicated to measuring the output of the generation (provide and install wiring and MID-specified meter socket and wiring). MID will reimburse the customer for hte reasonable associated costs and will provide the meter.
4. Arrangements utilizing transfer switches or alternatives to the arrangement shown above will be considered upon submission of a diagram and explanation of the porposed deivation(s).
5. Large commercial and industrial customers using C.T. style installations (400 amps and above) will need to contact MID Engineering for requirements.
6. Built in Inverter Disconnect Switches are NOT an acceptable alternative to the External knife blade DC switch.

MODESTO IRRIGATION DISTRICT

CONSTRUCTION STANDARDS

NET METERING
Residential & Small Industrial
Wiring & Meter Installation

REV	DESCRIPTION	INIT	CHK	RV'D	RV'D	RV'D	APP	DATE
B	ADD NOTE 5 COMMERCIAL & INDUSTRIAL	SDC	DBM	OKT	SDP	KCK	BLL	9-08
A	ADD INVERTER & DISCONNECT SWITCH	SDC		KCK			BLL	9-06
--	INITIAL ISSUE	SDC		OKT			BLL	2-03

SHEET 1 OF 2 | DWG. NO. 51092 B | PAGE

9/11/2008 10:43:00 AM, SdC