

## Solar Photovoltaic Systems Policy Manual Addendum

Solar photovoltaic (PV) systems are an eligible measure for WAP-eligible households. Solar PV may be mounted on a building or other structure or pole system within a previously disturbed area. Previously disturbed is land that has been graded, compacted, cleared, previously developed, or disturbed in any way. The cost of the solar measure(s) can be covered by co-funding from federal or non-federal sources. Funding to cover installation costs can be sourced from the following:

### **US DOE Formula or IIJA Funding**

- Any solar installation must follow all US DOE Formula or IIJA funding rules, with exceptions to the rules for the portion funded by EAPWX (if also used) as stipulated below.
- PV systems may be considered as an Energy Conservation Measure for site-built single-family homes owned by the occupant and rental buildings with one to four units.
  - Manufactured homes are not eligible for rooftop PV.
    - Pole mounted PV systems may be installed for clients if lot or land is owned by the occupant or a property owner under contract with an eligible renter.
- US DOE Formula or IIJA funding must be present in every WAP PV project through an existing or previous audit event to ensure projects meet the National Environmental Policy Act (NEPA) categorical exclusion.
- The US DOE average solar cost per unit for PY25 is \$4,302.
- The measure Savings to Investment Ration (SIR) minimum achieved by processing a WAPLink audit must be at least 1.0, using a 20-year measure lifetime. US DOE allows for the use of a greater measure lifetime if the warranty period of the shortest warrantied component is greater than 20 years.
  - The standard industry warranty is 25 years so most (if not all) solar PV models should use a 25-year lifetime. The contractor's bid will document the lifetime of warranty on each component.
- The job SIR must also meet a minimum of 1.0 and the solar measure must be the last measure to clear SIR on the overall Job SIR list of measures (see WPN 22-9.3 Co-funding).

### **EAPWX Funding**

- EAPWX funding can be used for PV installations only when in combination with US DOE Formula or IIJA funding.
  - Previously weatherized dwellings may be re-weatherized prior to the 15-year restriction to add solar using EAPWX and/or other non-federal funds if US DOE Formula or IIJA funding was spent on the initial weatherization.
  - If US DOE Formula or IIJA funding has been previously spent on an audit event, and a household is eligible, the home may be re-weatherized using EAPWX funds to add solar.
- US DOE Formula and IIJA funding rules (as noted above) apply to the use of EAPWX funding with the following exceptions:
  - Measure timeline specified in the SIR calculation of an itemized cost entry will be 25 years.
  - The measure cost funded by EAPWX must make a .75 SIR.
  - The EAPWX measure will not be displayed on the full job SIR list.
  - After running the audit with the EAPWX PV solar measure for SIR, run the audit again, unselecting the "Include in SIR" box to decouple this item's SIR from the audit for the final audit run.

- There is no solar Average Cost per Unit stipulation for the portion of the measure funded by EAPWX.
- See *Co-funding EAPWX funds with US DOE Formula or IIJA funded projects* for more information regarding Cost Effectiveness and solar Average Cost per Unit.

### **Utility or Other Leveraged Funding**

- If available, utility, or other non-federal leveraged funding, should be used with Federal funding.
- Installations must adhere to and comply with all program requirements of any leveraged funds.
- Any front-end incentives from a utility program, such as Xcel Energy's Income-Qualified Solar\*Rewards, or other leveraged fund source, will be assigned by the client to the solar installer to be applied to the front-end installation cost. This process is completed through the Interconnection Agreement (IA) with the utility. The installing contractor will assist with the process.

## **POLICY**

### **System Size**

- Each installed system for single family homes shall be no smaller than 1.8 kW and no larger than 5.0 kW. System size of slightly greater than 5.0 kW may be allowed on a case-by-case basis if the preferred layout exceeds 5.0 kW with the inclusion of the desired number of modules.
  - For example, if a roof surface would accommodate a four-by-four layout of 16 325-watt modules, for a total system of size of 5.2 kW, this must be submitted as a special case to Commerce, rather than requiring that only 15 modules be installed to keep the system size under 5.0 kW.
- Each installed system on multi-family homes of two to four dwelling units may be up to a maximum size of 15 kW. Solar PV is not an eligible WAP measure for multi-family buildings with five or more dwelling units.
- PV systems must be sized to generate no more than 100 percent of the electricity used by the WAP customer during a typical year.

### **Warranties and Other Requirements**

- Battery storage is not permitted as part of a WAP PV project.
- No tree removal is allowed.
- All equipment must be new and UL CERTIFIED and listed on the California Energy Commission website at [Solar Equipment Lists Program | California Energy Commission](https://www.energy.ca.gov/2017-07-01/solar-equipment-lists-program).
- All installed solar PV systems will include theft deterrent devices, such as break away nuts and bolts, that will not void the PV panel/module manufacturer's product warranty or production warranty.
- PV modules must carry at least a ten (10) year manufacturer's product warranty, and at least a twenty (20) year manufacturer's performance/output warranty that modules will generate no less than 80% of rated output under Standard Testing Conditions (STC).
- Inverters shall be UL 1741 Certified, and shall be, at a minimum, string inverters with DC optimizers or micro-inverters having a minimum twenty (20)-year warranty. Twenty-five (25) year warranties on inverters are preferred.
- Warranties shall start on the date of final inspection of the solar installation.

- All solar PV systems must carry at least a one-year workmanship warranty from the subcontractor(s) with a minimum five-year installation workmanship warranty preferred.
  - Exception: If a utility rebate is used on the installation, and the rebate includes a back-end performance-based incentive (PBI) payment, the workmanship warranty must be extended to cover the term of the back-end incentive payment term.
- In exchange, the PBI will be assigned to the contracted solar installer.
  - For example, installations on which Xcel Energy's Income-Qualified Solar\*Rewards funds a portion of installation costs receive a PBI for 10 years. Workmanship warranties for these projects must cover the entire term of the PBI for the back end PBI to be assigned by the client to the solar installer of record.
- The workmanship warranty is intended to cover any unexpected operations and maintenance (O&M) costs not covered by the manufacturer's warranty, including the cost of associated labor or material costs of the needed O&M. Installers must provide written documentation to the WAP Service Provider and to the client stipulating the term of the workmanship warranty and what is covered by the warranty.
- All PV installations must receive a final inspection by a certified Quality Control Inspector (QCI). The QCI final inspection must verify that all permits are acquired and signed off by all required parties. The QCI inspector must also confirm the following have been completed or conducted:
  - Confirmation of warranty information provided to the building owner/ household resident.
  - Client education provided by PV installation contractor, including any Operations and Maintenance required for system.
  - Quality of install, and acquisition of all required paperwork, including required state electrical inspector sign-off.
  - Client interview for satisfaction.
  - Review of the project recap sheet and Solar Book to ensure file completeness.
  - Confirmation of client authorization for MN Dept of Commerce to receive production data.
- For rental properties with two to four units, a property owner contribution may be required based on individual Service Provider policy. Service Providers may find a property owner contribution to be necessary to allow the project to meet the required SIR thresholds.

#### **Co-funding EAPWX Funds with US DOE Formula or IIJA Funded Projects**

When co-funding EAPWX funding with US DOE Formula or IIJA funding, the following policies are variable depending on the source of the funds. In general, Solar into WAP projects follow all policy requirement as filed with the US DOE, with the following exceptions.

#### **Cost-effectiveness**

- The portion of the project costs covered by US DOE Formula or IIJA funds must achieve a savings-to-investment ratio (SIR) of 1.0 or greater.
- When project co-funds US DOE Formula or IIJA funds with leveraged utility or other funds, *but no EAPWX funds*, the full expected annual system production will be assigned to the US DOE Formula or IIJA-funded itemized cost measure.
  - The portion of project cost provided by US DOE Formula or IIJA must make a measure and job SIR of 1.0, and the solar PV measure must be the last measure in the list of job measures clearing 1.0 SIR. If the measure is not the last on the list, the project requires pre-approval from Commerce.

- No SIR calculation is required to be run for the funds covered by leveraged utility or other funds, unless required by the rules of those funds.
- SIR calculations performed on the funding assigned to US DOE Formula or IIJA must use a 20-year lifetime or use the warranty period of the shortest warrantied component, whichever is greater.
- When US DOE Formula or IIJA and EAPWX funds are combined on a PV project (with or without leveraged non-federal funding), the percentage of the expected annual system production assigned to each Federal fund is variable depending on how many kWh each fund needs to make the associated SIR requirement.
- The expected kWh production TOTAL must be fully assigned between the two Federal funds.
- When co-funding US DOE Formula or IIJA and EAPWX funding on a solar measure, two SIR calculations must be run, with each portion of funding meeting the SIR requirements as stipulated for the specific fund.
  - SIR calculations run on the EAPWX portion of solar project funding must make an SIR of .75, utilizing a 25-year lifetime. EAPWX funding must not be included in the final job SIR list of measures.
  - After running the audit with the EAPWX PV solar measure for SIR, run the audit again, unselecting the "Include in SIR" box to decouple this item's SIR from the audit for the final audit run.
  - SIR calculations run on the US DOE Formula or IIJA portion of solar project funding must make a measure SIR of 1.0, utilizing a 20-year timeline (or the warranty period of the shortest warrantied component), the job SIR must be at least 1.0, and the solar measure must be the last measure to make 1.0 on the overall job measures list.

## PROCEDURES

### **Solar Book**

The Solar Book is a data capture and tracking tool that assists Service Providers in navigating Solar PV installations through the WAP. The Solar Book is laid out sequentially, beginning with a checklist, so that following from one page to the next provides all the documentation as required.

- The Solar Book, and other helpful resources, can be found in the Solar folder at Box.com in the "Shared Solar Documents" folder. It is offered as an Excel document or in a Power Point version.
- A complete Solar Book is required in the pilot phases. Once the pilot is complete, Service Providers may use alternate data capture methods if preferred.

### **Site Evaluation**

#### **Roof Mount**

The Service Provider auditor should inspect the home during the initial energy audit to determine if the home is a good candidate for rooftop PV. The auditor should use the solar suitability pre-assessment checklist, noting the items below:

- Age and condition of the roof
- The roof covering type
- Roof orientation (azimuth) of between 120 and 240 degrees (southeast to southwest)
- Solar array installations with azimuth of 90-119 degrees, or 241-270 degrees may be eligible but require Commerce review and assessment before seeking Installer bid

- Open square footage available for panel installation, and an estimate of the number of modules that can fit on the roof
- Any potential shading obstructions
- Whether the roof where panels will be installed is free of shade from 10am to 2 pm, the status and size of the home's main electrical panel
- Available locations and space for mounting electrical components
- An evaluation of electricity usage. Initial evaluation may be based off estimated electrical load, but solar installers will need actual monthly electrical bills for final system design

### **Roof Condition**

If roof is in poor condition, it must be repaired or replaced prior to installation of rooftop PV. Repairs must be able to qualify as an incidental repair measure (IRM), funded by funds other than US DOE funds, or the solar PV measure must be deferred until roof repairs are completed. See Policy Manual 4.2.2 for requirements to handle roof repairs as an IRM.

In assessing roof condition, auditors should consider:

- The remaining estimated roof life should be at least 15 years.
- Whether roof framing and sheathing are in good condition, note rafter spacing.
  - Check for 2' on-center trusses, no soft spots in the roof, and no broken or sagging trusses.
- If there are any roof leaks.
- The tilt angle of the roof.
  - For optimal solar performance, the roof tilt should be between 20 degrees and 45 degrees (4/12 to 12/12). In Minnesota, the most ideal tilt for maximizing year-round solar production is 38 degrees.

To help determine if a roof can support solar panels without a full engineering review, a [Standardized Load Table](#) for residential solar has been developed by Commerce and MN Dept of Labor and Industry.

### **Ground Mount or Pole Mount**

For situations where roof mounting is not feasible or optimal. Along with the rooftop items related to the Balance of System, the following items should be considered:

- Site will have minimal shading.
- Site will be easily accessible.
- Site will have low-growth vegetation.
- A typical 5kW system will require 300 to 400 square feet.
- Terrain alterations are not allowed.
- PV Watts can be used for the initial model.

### **Electrical Service**

A thorough inspection of the existing electrical system must be performed prior to considering the household for PV. Consideration must be given to whether enough physical space exists near the electrical service to install the solar electrical components, as well as if space exists in the electrical panel to add the PV service. A 200-amp service with open circuit breaker slots are ideal, though upgrades to the electrical system will be allowed if the upgrades can be handled under the IRM policy or if funded by other funds. (See Policy Manual 4.2.2 and the Allowable Measures Chart – Audit Event).

### **Preliminary Qualification Work**

In addition to onsite assessment of the household's suitability for PV, WAP personnel must also perform an assessment of the solar suitability of the household by reviewing and assessing the items below.

#### **Household Electrical Bills**

Gather household electrical bills, or use EAP application numbers, to get an estimated annual kWh usage number and cost.

- Initial energy usage estimates may come from the EAP application, but solar installers will need at least 12 months of actual electric bills or a 12-month summary (both cost in dollars and kWh used each month) once involved.
- Most electric utilities will supply a 12-month summary of electrical usage in kWh and total charges in dollars upon request.
- An analysis document of the full year electrical usage must be included in household client files as part of the final Solar Book.

#### **Solar Suitability Analysis Application**

A solar Light Detection and Ranging (Lidar) tool such as the [MN Solar Suitability Analysis App](#), must be used for the initial analysis.

Note: this tool is very sensitive to the exact placement of the locator on a rooftop or surface. You will need to try several specific spots to determine the best solar Lidar results.

Include a copy of the report in the Solar Book for the household file. The solar resource tool results should be cross-checked with the auditor's evaluation of the site and other recent online imagery such as Google Earth or Google Maps Street View to check for shading from trees that may have grown significantly since the Solar Suitability app Lidar data was collected (between 2006 and 2012).

#### **PV Watts**

- Utilize [PV Watts](#) to run an initial system size production estimate for the household location.
- If more than one roof surface is expected to be used for the PV installation, a PV Watts run must be done for each solar-potential roof surface using an estimated size of the installed system for each separate roof surface (for example, 3.0 kW on a SE-facing roof surface and 2.0 kW on a SW-facing roof surface).

#### **SIR Calculation**

Utilizing either US DOE Formula, IIJA, or EAPWX funding on a solar project will require energy model SIR calculations run on the portion of the installation cost to be funded by each fund, respectively. The SIR calculations will be done in WAPLink using the itemized cost functionality. See WAPLink Procedures section below for instructions on how to do this. Any IRM costs to support the solar installation must be considered as well and handled as per standard IRM requirements. (See Policy Manual 4.2.1. and 4.2.2.) SIR calculations must be run as part of the initial "solar suitability" assessment (using estimated price, size, and generation) and then once the job is contracted, using the new numbers as supplied by the contracted solar installer. Results of both the preliminary assessment and the post-contracting SIR calculations must be documented in the Solar Book.

- Using the Measures tab in WAPLink, create a Manual measure for each federal funding source to be used.
- If using only US DOE Formula or IIJA funding on the job, along with leveraged utility or other non-federal funding, enter the proposed system size, the total expected annual kWh production of that system, and the cost to be covered by US DOE funding. Specify life of system as 20 or 25 years.
  - The measure and job SIR must both be at least 1.0, and the solar measure must be the last measure to make SIR in the full "job measures" list.
  - If the measure is not the last on the list, the project requires pre-approval from Commerce.
- If co-funding US DOE Formula or IIJA and EAPWX funding (with or without leveraged non-federal funding), two WAPLink SIR calculations must be completed. The total estimated annual kW generation number must be divided between the two funds, as appropriate, in a manner that facilitates each fund meeting the SIR requirements of each fund.
  - For the EAPWX-funded portion of the cost, the measure life must be specified as 25 years and a measure SIR of .75 must be met.
  - After running the audit with the EAPWX PV solar measure run for SIR, run the audit again, unselecting the "Include in SIR" box to decouple this items SIR from the audit for the final audit run.
  - The requirements for the SIR calculation for US DOE or IIJA-funded portion are the same as outlined in the bullet above, except for using only a portion of the total estimated annual kWh generation in the calculation, rather than assigning 100% of the kWh production to the US DOE Formula or IIJA funds.
  - Solar project audits may need to be run two or more times, with adjustments made to estimated kWh generation and costs assigned to each fund, to achieve the desired SIR results.

### **Solar Professional Site Assessment**

After the agency auditor determines that the home is a potential candidate for Solar PV, a Solar PV site assessment must be performed by an experienced solar site assessor or solar installer. Solar installers are responsible for performing on-site solar site assessment and making the final decision as to whether the household is appropriate for the installation of solar.

### **Procurement of Services**

Service Providers must follow all standard WAP procurement requirements for acquiring the services of a contractor. The solar installer contracted to do the job will design and appropriately size the proposed solar PV system (within the stipulations of the WAP program rules) and provide an estimated annual kWh production number. Solar Installation and Site Assessment professionals must be eligible solar contractors who meet all Federal and State requirements.

### **Project Approval Process**

Commerce review and approval is needed on the initial PV installations done by each individual Service Provider. Commerce review will be required for at least the first two installations done by each Service Provider, or until Commerce staff determines that the Service Provider has demonstrated the ability to consistently complete PV projects in accordance with policy and determined Commerce review is no longer required. The provided Solar Book is meant to help organize and document progress (item one in this Procedures section). The Solar Book follows the descriptions below of items included in each phase of the process.

Review and approval occur as a three-phase process. For each phase, documentation must be sent to the Solar Technical Assistance Liaison (STAL), as a single PDF or PPT file, for initial STAL review and Commerce review and approval.

#### **Phase I Approval Submission Package**

- Preliminary in-house solar suitability work includes:
  - Auditor's site assessment checklist
  - Site pictures (aerial and ground- based)
  - PV Watts results, Lidar/Solar Suitability report
  - An analysis of one year of household energy usage, with both monthly kWh-used and monthly billed- cost information
  - WAPLink SIR estimated results (from the auditor's estimated costs and PV Watts- estimated energy production)
- Solicitation and Procurement documentation, including:
  - An installation agreement form
  - Full professional solar site assessment
  - The bid for installation cost with estimated system size and generation estimate
- Updated WAPLink SIR using the installer's bid numbers for system size and estimated kWh generation. The measure cost for the SIR calculations(s) must be the portion of the installation costs funded by US DOE Formula or IJJA, EAPWX, or both.
- Solar projects must follow policy 3.7 State Historic Preservation Office Review. Homes requiring a secondary review must provide proof of SHPO review and approval, including an email from the designated State of MN SHPO-reviewer stating "Solar SHPO review completed and HH approved for Solar".

#### **Phase II Approval Submission Package**

- Commerce Phase I packet approval email (until Commerce review is no longer required).
- Final contract and supporting documentation from solar installer receiving bid.
- Completed system design from installer.
- Full application package submitted for utility rebate, permit(s), interconnection agreement, and net metering agreements. Include any supporting documentation submitted, such as a one-line electrical diagram, lay-out design, and wiring design.
- Final approvals and supporting correspondence related to utility rebate (or other leveraged funds), permit(s), interconnection agreement, or net metering agreement.
- Planned Installation timeline (given in days or weeks, not date specific).
- Signed household owner or property owner agreement allowing installation of Solar PV and acknowledging that the building owner does not intend to remove the system prior to the end of the system's useful life, as well as building owner agreement that Commerce can receive post- installation production information. A Solar Installation Agreement Form Template can be found in the Solar shared documents of the Solar folder in Box.com.
  - For rental properties with two to four units, the property owner agreement must include agreement to provide any required contribution as per Policy Manual section 3.3.6.

### **Phase III Approval Submission Package (Completion)**

The Phase III approval process must be completed, prior to payment of the solar installer's invoice for service and must include:

- Commerce Phase II packet approval email (until Commerce review is no longer required).
- Client utility incentive-assignment documents (front-end and/or back-end).
- Copy of inspector's sign-off for all required permits and inspections.
- Copy of QCI sign-off.
- Details on when interconnection was completed, or when interconnection is scheduled to occur.
- All other post-work contractor documents as normally required of any WAP contractor (lien waivers, invoices, customer completion certificates, etc.).
- Copies of warranties, operating manuals and system operation documents provided to household.
- Household signed acknowledgement of receipt.

### **Household Client File Inclusions**

In addition to items listed in Policy Manual section 4.3, the following must be included in the household file as part of the Solar Book:

- All documents and emails related to acquiring Commerce project approval, including complete Phase I, II and III packets, when participating in an onboarding pilot.
- Specification sheets, warranty information, and operating/owner's manuals for all major components of solar PV system.
- Client signature forms related to:
  - Client education
  - Client satisfaction
  - Building owner/property owner agreement
  - Client confirmation of receipt of warranty information
  - Release of client contact information
- Obtain 12 months of electric usage history to be provided to the solar installer
- Access to real-time and cumulative data on solar PV system performance for at least 10 years, granted to:
  - The installing solar company
  - The Weatherization Assistance Program (WAP) Service Provider
  - The Minnesota Department of Commerce

### **PV Solar Installer Requirements**

- Solar installers will instruct the WAP customers on system operation and provide warranty information and operating manuals to the WAP customer.
- Installers will ensure that the installed system is commissioned and operating properly.
- Installer will provide Manufacturer's Specification Sheets for the component materials used on the installation:
  - PV panel/module utilized, including warranty information.
  - Inverter/Microinverters/Optimizers utilized, including warranty information.
  - Racking, mounting frames, brackets, or other mounting system utilized, including warranty information.
- Installer will provide all labor, materials, permits, supplies, equipment, and supervision

required to design, furnish, construct, and commission the solar PV system, including all necessary devices and connections between inverter and main electrical service.

- Materials Exception: If a Service Provider participates in bulk-buy master agreement to acquire the major solar PV components, those bulk-buy materials may be utilized if they meet all the other requirements and stipulations of this policy.
- Installer will provide Installation drawings and field wiring diagrams.
- Installer will provide in electronic format preliminary and as-built versions of the submittals and drawings, including shade analyses.
- Installer will provide lien waivers for payments at time of bill payment.
- Confidentiality of all eligible WAP client information is required in accordance with the Privacy Act of 1974. Solar installers shall be responsible for the privacy of all data disclosed to them as necessitated to participate in this project.
- Installer shall agree to attend any pertinent meetings/conference calls as deemed necessary by any WAP Service Provider, Commerce, and/or utility. Invoices submitted by solar installer will be authorized for payment only after all required forms and documents have been submitted, and the weatherization agency verifies that all work is completed and conforms to the project standards and requirements as well as the appropriate WAP Field Work Standards.
- Callbacks required solely due to solar installer error and/or deficiencies in installer work will be performed promptly, and installer will be responsible for all associated expenses.
- Installer is solely responsible for determining the techniques, means, methods, and materials of installation to meet the requirements of the bid. All work must comply with the WAP contractor standards stated in Policy 7.4.2.

#### **WAPLink Solar Process**

Due to the cost limit of \$10,000 for measures in WAPLink, you may need to create three measures to accommodate the creation of a solar measure.

- Measure one will be created to model the required US DOE/IIJA measure.
- Measure two will contain data for the EAPWX or other eligible fund.
- If measure two is greater than \$10,000, a third measure needs to be created. This amount can be split 50/50 with measure two or can be the overage from \$10,000. Keep in mind that the Energy Savings entered needs to correspond to the dollar amount entered for the measure.

#### **Energy Modeling Procedure**

1. From the job screen, select "Measures"
2. Select "New"
3. Select "Manual Measure"
4. Click "Include in SIR"
5. Enter in the Measure Description, Cost, Energy Savings, Energy Unit, Life (25 years), and Fuel (Electricity)
6. Click Save
7. Create a new measure(s) and repeat steps 3 – 6 as needed
8. You can now process the audit and check generated measure and job SIRs

## Examples

The following example shows data entered for the US DOE portion of a 4.8 kW system that costs \$18,575 and has estimated production of 6,700kW.

Measure

WAPLink Measure  Manual Measure  Health and Safety  Deferral Mitigation  Include in SIR  
 EXP Measure  IRM  GHW  Travel

Measure Description (\*)

Solar PV DOE 4.8kW

Cost	Material Cost	Labor Cost
\$2,500.00	1500.00	1000.00

Energy Savings	Energy Unit	Life	Fuel	Materials
1000.00	kWh	25.00	Electricity	

The following example shows data entered for the EAPWX portion of a 4.8 kW system that costs \$18,575 and has estimated production of 6,700 kW.

Measure

WAPLink Measure  Manual Measure  Health and Safety  Deferral Mitigation  Include in SIR  
 EXP Measure  IRM  GHW  Travel

Measure Description (\*)

Solar PV EAPWx 4.8 kW

Cost	Material Cost	Labor Cost
\$8,037.00	4037.00	4000.00

Energy Savings	Energy Unit	Life	Fuel	Materials
2850.000000	kWh	25.00	Electricity	

The following example shows data entered for the SECOND EAPWX portion of a 4.8 kW system that costs \$18,575 and has estimated production of 6,700 kWh.

Measure

WAPLink Measure  Manual Measure  Health and Safety  Deferral Mitigation  Include in SIR  
 EXP Measure  IRM  GHW  Travel

Measure Description (\*)

Solar PV EAPWx(2) 4.8 kW

Cost	Material Cost	Labor Cost		
\$8,037.00	4037.00	4000.00		
Energy Savings	Energy Unit	Life	Fuel	Materials
2850.000000	kWh	25.00	Electricity	

The following is an example of the Energy Saving Measure Economics from a completed audit run.

ECM								
1		Lighting Retrofits	L-Incan	\$17.64	\$30.00	12.32		12.320
2		Attic Insulation R19	Lower Attic,Upper Attic	\$88.85	\$909.15	1.95		2.280
3		General Air Sealing		\$216.72	\$1,000.00	1.62		1.940
4		ECM Motor Motor	Itemized Cost	\$38.41	\$500.00	1.17		1.780
5		Solar PV DOE 4.8kW	Itemized Cost	\$154.86	\$2,500.00	1.13		1.450
6		Solar PV EAPWx 4.8 kW	Itemized Cost	\$441.35	\$8,037.00	1		1.180
7		Solar PV EAPWx(2) 4.8 kW	Itemized Cost	\$441.35	\$8,037.00	1		1.110
8		Replace HVAC System	HS1	\$238.94	\$4,500.00	0.75		1.050