

Frequently Asked Questions SERC Technical Assistance

1. Who do I contact for program guidance?

Consult your DOE Project Officer for guidance on program requirements such as allowable expenditures, timeline, Statement of Work (SOW) changes, contracts, etc.

2. Where can I get technical assistance on projects or technologies?

The National Renewable Energy Laboratory (NREL) can provide technical assistance for SERC grantee projects. NREL can also link you to other national labs for help, but always start with NREL. To get help from NREL, send your request to SERC_TA@nrel.gov.

3. Are there any online resources I can access?

- Webinars—check the SERC website for the [schedule](#).
- Conference Call with an Expert—request a session by topic if you want to engage in peer-to-peer exchange with people who are doing similar projects. Both an NREL expert and an NREL facilitator will attend.

NREL can send an expert to your state for program development and technological advice. For example, an NREL solar expert attended the Idaho state SERC kick-off meeting to answer questions and provide guidance on project start-ups. For more information, email SERC_TA@nrel.gov.

- Webinars, slides, and other documents can all be found on the SERC [website](#).

4. Is there a list of SERC-approved products?

NREL cannot endorse products, but can review a product's technological application. Just email NREL at SERC_TA@nrel.gov.

5. What are some examples of SERC technologies that certain agencies have been approved to install?

Renewable Energy

- Solar photovoltaic (PV)
- Solar air heating
- Solar shingles
- Small-scale wind energy
- Solar hot water heaters
- Solar thermal heating
- Solar air heating (solar furnaces)
- Geothermal heat pumps
- Geothermal heating

Energy Efficiency

- Hot water heaters: tankless, heat pump, hybrid, geo-spring, etc.
- High performance heating systems
- Deep energy retrofits

- Window replacements combined with masonry foam insulation
- Air conditioning heat pumps
- Ductless heat pumps
- Community-based social marketing (energy coaches)
- In-home energy monitoring devices
- Efficient clothes washers and dryers
- Cool-roof technologies
- R-5 window replacement
- Any other item that is not otherwise approved for a Weatherization Assistance Program- (WAP) financed upgrade

6. For solar hot water, how does one decide between solar-evacuated-tube thermal collectors and flat plate collectors?

When selecting solar thermal technologies, the following generalizations can help determine which equipment is optimal.

Requirement or Description for Solar-Powered Device	Evacuated Tube Collectors	Flat Plate Collectors
Space heating through forced air hydronic coils	X	
Radiant floor space heating**	X	X
Domestic hot water		X
Space heat (such as supplementing boilers)	X	
Radiant heat (such as old cast iron room units or other centralized radiant systems)		X
Features higher labor and material cost	X	
Repairs are more simplistic (and don't require full system shut-down)	X	
Superior ability to clear snow and frost (in cold climates, it is advisable to keep evacuated tube collectors free of snow and frost to maximize efficiency)		X
Produces higher temps than domestic hot water heat requires	X	
Takes more effort to hoist onto a roof		X

**Flat plate collectors are preferable, but evacuated tube could be used because this kind of heat doesn't require high temperature output.

NREL's [Webinar](#) on SERC solar applications can be found on the SERC [website](#).

7. What are the energy efficiency advantages of ductless mini-split heat pumps?

In ductless systems, one outdoor unit serves multiple indoor units (each containing a refrigerant coil and blower). Refrigerant is piped from the outdoor unit through small-diameter insulated refrigerant lines directly to individual rooms or zones. Fans in each individual evaporator unit blow cooled air into the room. The term “mini” describes the small indoor units located in each room or zone.

Because ductless mini-split heat pumps pipe refrigerant directly to air handlers, they do not require ductwork, which can often be leaky and inefficient. Distribution losses in conventional cooling systems can be as high as 30%, while distribution losses from ductless systems are 1%–5%. For more information, please go to the National Association of Home Builders’ (NAHB) [page](#) on ductless mini-split heat pumps.

8. What are the benefits of heat pump hot water heaters?

Compared to conventional electric water heaters, heat pump water heaters (HPWH) are more efficient and can save 30%–50% on heating costs. HPWH are well suited for applications in warm climates where electric rates and hot water use are high.

HPWH units emit cool air during performance, which is not a desirable feature in cooler locales where people rely on indoor heating. When evaluating the unit’s placement, it is important to gauge its proximity to a heated space.

[Learn more](#) from NAHB.

9. Are geothermal heat pumps expensive? Is it possible for them to be cost-effective upgrades in long-term weatherization retrofits?

Geothermal heat pumps are similar to ordinary heat pumps, but make use of consistent temperatures in the ground rather than outside air to provide heating, air conditioning, and in most cases, hot water. Because they use the earth’s natural heat, they are among the most efficient and comfortable heating and cooling technologies currently available.

The cost of geothermal heat pumps varies by region, lot size, and the kind of equipment selected. Equipment costs can be 50%–100% more expensive than air source heat pumps, but they can be comparable in costs to installing a high efficiency boiler/hot water heat system.

The ground loop is the most expensive component and can cost between \$1,000 and \$3,000 per installed ton. However, geothermal heat pumps are more efficient and can save homeowners 30% - 70% on heating costs and 20% - 50% on cooling costs over conventional systems.

[Learn more](#) about ground source heat pumps from the Environmental Protection Agency (EPA), or from [information](#) found on EERE’s Energy Savers site.

See the SERC website for the Geothermal Heat Pump [Webinar](#).

10. Is there a tool to calculate energy savings from cool-roof technologies?

See [DOE’s Cool Roof Calculator](#) and the [ENERGY STAR Roof Calculator](#).

11. Can tankless hot water systems provide enough hot water for residential needs?

Tankless, or demand, water heaters can provide 2–5 gallons of hot water per minute. Gas-demand heaters can supply higher flow than electric-demand heaters.

Households with large, simultaneous demands (e.g., running the dishwasher and shower at the same time) may not receive enough hot water from tankless water heaters. The installation of multiple tankless heaters (connected in parallel or as dedicated heaters for certain applications) can overcome this problem. For more information see [ENERGY SAVERS Tankless Water Heaters](#).

12. How do in-home energy monitoring devices work?

In-home energy monitoring devices provide residents with instant feedback on their energy use, which has been proven to lower usage. For these devices to be fully effective, residents must be fully educated and willing to participate when the units are installed.

Units range from simple to complex, and function in a variety of ways. Some

require computer monitoring and others are shelf-top, stand-alone units the size of a large thermostat. Expensive models can double with a data logger for tracking separately.

SERC recommends low-cost solutions that monitor current energy use and energy use over time. NREL will soon publish a paper detailing this technology.

13. What window values (U and R) are allowable under SERC?

- U-factor is used to measure how well a window, door, or skylight prevents heat loss. The lower the number, the more efficient the window. Ratings usually range from 0.20 to 1.20. SERC grantees should install materials that earn a .30 U-factor or better, unless the materials’ cost drives the benefit far below a reasonable savings-to-investment (SIR) ratio.
- SERC does not specify the type or performance required for windows installed during an upgrade. Added/replaced windows should provide energy cost savings at reasonable cost. Energy auditors who use the [National Energy Audit Tool](#) should be able to recommend options that yield an acceptable SIR.

SERC grants waive the SIR requirement that has traditionally prevented WAP grantees and sub-grantees from installing windows in low-income homes. However, in the spirit of the grant and whenever possible, SERC grantees should attempt to achieve a cost-effective SIR of 1, knowing that there is a goal of possibly integrating these sorts of successful technologies into the WAP program.

- The Solar Heat Gain Coefficient (SHGC) is another effective way to measure energy savings. [ENERGY STAR requirements](#) are a good place to start, as they specify allowable U-factor and SHGC for different climate zones. [ENERGY STAR Performance Criteria](#) also provide a good guide for minimum window energy ratings.

14. Does NREL have cost data for energy efficiency retrofit measures?

Yes. NREL has developed the [National Residential Efficiency Measures Database](#), a tool that provides national unified data on residential retrofits and costs.

15. Does the EPA lead-safe law for “Renovations, Repairs and Repainting” apply under SERC?

Yes.

16. What accreditation or certification is required for SERC contractors?

It is advisable to always use contractors who comply with local codes and licenses. If using a solar contractor, try to get a North American Board of Certified Energy Practitioners (NABCEP)-certified contractor.

17. What specific pre-and- post diagnostic testing should be performed?

In almost all situations, local agencies should be returning to already-weatherized units to install SERC technologies, or installing these simultaneously while weatherizing units funded under the 2009 Recovery Act. In these cases, the standard WAP diagnostic tests should be performed for each weatherization. The agencies may conduct additional testing for specific SERC measures (e.g., determining roof strength if installing solar PV or solar hot water heaters, or doing additional blower door tests if the SERC technology is aimed at providing superior air sealing performance. This might mean doing a blower door test after weatherization before the SERC measure is installed, and then again after SERC measure is installed).

Post-testing may also be required, such as in cases when the work affects the combustion appliances or minimum ventilation of the living space.

In addition, evaluation work should monitor energy savings, when possible, as a reminder to agencies that they should obtain utility bill releases for all

SERC clients (see the DOE policy [Q&A](#), question 23).

18. How do we calculate a SIR?

SERC has specific SIR requirements in two situations:

- For measures not listed on DOE’s [Appendix A](#) (an appendix of WAP-approved weatherization materials), no SIR is required. However, in the spirit of the grant, grantees should attempt to achieve a cost-effective SIR of 1 whenever possible. This way, these technologies can be integrated into WAP if they prove to be both energy efficient and cost effective. Various tools can help weatherization agencies calculate these measures’ cost effectiveness. NREL can advise on how to calculate these values.
- For measures that are listed in DOE’s Appendix A, SERC funds can be used for the measures’ installation if they are not cost-effective under WAP guidelines (e.g., if they have a SIR of less than 1). For these measures, local agencies should run an audit to verify if the measure’s cost-effectiveness makes it eligible for SERC. Remember, though, that the spirit of the grant is to provide energy benefits and cost savings to low-income clients, so this sort of measure should be installed only where it will provide significant energy efficiency benefits.

19. How can we measure client education/behavior change?

This is one of the greatest challenges in studying energy conservation, because occupant behavior varies so greatly from one person and/or household to the next. Vermont is using part of its SERC grant to evaluate the effectiveness of energy counselors as an independent variable in energy retrofits. This type of approach must be set up correctly so that an evaluation can determine whether it was beneficial or not.

If you would like assistance in program planning or an NREL-staffed conference call with other grantees who are

attempting to measure the energy-saving impacts of behavioral interventions, send an email to SERC_TA@nrel.gov.

20. Do you have any advice on how to write RFPs?

If you would like RFP templates for:

- Solar PV
- Solar hot water heating
- Solar air heating panels
- Tankless hot water heating

please send an email to SERC_TA@nrel.gov. NREL can review your RFPs before you issue them, assist in setting up your review criteria, and review responses to your RFP by evaluating the technical aspects and determining whether or not the response meets the requirements.

21. Can SERC funds be used to purchase extended service contracts?

No.

22. How can we best evaluate our SERC grant outcomes?

Agencies are encouraged to do what they can to evaluate grant outcomes. Oak Ridge National Laboratory (ORNL) will be working with many agencies to develop energy savings estimates for installed technologies.

The best way to determine energy savings from a certain technology is to install only one measure per home. Some agencies are installing a package of measures in homes, in which case the package of measures can be evaluated. If agencies are installing packages of measures that are not the same from one home to another, it will be very difficult to discern energy savings from the measures.

Please contact ORNL if you have further interest or questions about evaluating the results of your projects:

– [Bruce Tonn](#)
– [Erin Rose](#)
– [Tim Hendrick](#)