Energy Audits, Reports & Upgrades

A Guide for Choosing & Working Well with Home Performance Contractors

Energy audits can be a powerful tool to help you make your home safer and more comfortable, cut down on your energy use and bills, and chart a path towards reducing or eliminating your use of fossil fuels and becoming a net-zero home. We’ve compiled this document based on the combined experience of local contractors and residents in order to help guide you through the process, and help you reach your energy-related goals.

Using this guide and doing your homework can help you achieve:

- On Schedule vs. a Schedule disruption
- Good quality vs. Poor quality work
- Real energy savings vs. Little savings
- Within budget vs. Major changes of cost
- Good contractor relationship vs. Disputes with contractors

It can provide tips to help you navigate the whole process from choosing a contractor, to getting an audit and the type of report you are looking for, to deciding on the work, and signing a contract.

I. Choosing a Contractor

It makes sense to spend some time choosing your energy contractor and finding one you like and can trust. In general, the contractor that does your energy assessment will be the one that will do the work suggested in their report. While you don’t have to use the same contractor that performed the audit—and you probably shouldn’t if you didn’t like the audit experience—the New York State incentive programs are set up to encourage you to do so. Here are some things to consider when choosing a home performance contractor:

- Work with a Get Your GreenBack Contractor Partner. They have agreed to a set of standards and good practices. Find a list at www.getyourgreenback.org/energy-efficient-home.
- Ask people you know who have had similar work done for recommendations

At any point in time along the way if you have a question don’t hesitate to contact our Energy Advising program. We’re here to help.
✓ Ask potential contractors for a set of references and follow up with them all and ask if they were satisfied with the work.
✓ Ask contractors questions, such as:
  o How many audits and energy upgrades have you done under the NYSERDA\(^1\) programs?
  o How long has your company been in business for?
  o What experience do you have working with [your type] of home? (e.g. mobile home, 200-year-old farmhouse, brick walls, etc.)
  o Tell them about your concerns and ask them what experience they have dealing with that type of concern
  o Can you share with me examples of audit reports you have done?
  o What BPI\(^2\) certifications and other certifications do you have?
  o Do you offer other services? (some will just do building envelope work like air sealing and insulation, while others offer heating options, or even solar)
  o What procedures do you use to ensure high quality work? Do you have a process for quality control?
  o How soon can you schedule an audit and the work?
✓ When you have chosen the auditor you’d like to use, make sure you ask them how long the audit will take and to schedule it at a time when you can be there for the whole time.

II. The Energy Audit

Before the auditor arrives
☐ Make sure all the spaces in your home are accessible for the auditor to check. Give special attention to the basement or area where your heating equipment is located. Also provide access to areas that are cold, attics, unheated crawl spaces, etc.
☐ If you heat with wood, make sure your fire is out, and you clean out your firebox and ash pan. Otherwise the blower door—a tool used to test the “leakiness” of your home—may suck ashes all over your room.
☐ Write down a list of concerns you have about your home that you would like to be addressed, and any questions you may have. Examples include uncomfortable zones around your home, ice dams/icicles forming on some parts of your roof, humidity/mold issues, high bills, and so on.
☐ Have energy bills, or at least one recent one, available.
☐ Make sure you have blocked out 4 hours of your schedule in order to be there for the full energy audit. You will learn the most from the process if you can accompany the auditor throughout the visit. You may want to invite other family members to be there as well. Auditors are in fact not allowed to continue with the audit if someone is not there at the home.

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\(^1\)The New York State Energy Research and Development Authority is in charge of fomenting energy efficiency and renewables throughout the state.
\(^2\)The Building Performance Institute certifies auditors, and provides guidelines for their work. More at [www.bpi.org](http://www.bpi.org).
When the auditor arrives
- Discuss your list of concerns
- If you are interested in exploring new or alternative heating systems or looking to replace your existing system, specify you would like a **heat load analysis** included in your report. This will help you better determine the appropriate size of a new heating system. This level of analysis is not required under the energy audit protocols of the Building Performance Institute (BPI), which certifies auditors and created the test protocols, but many contractors will provide it if requested.

During the audit
- Accompany the auditor throughout the process to learn as much as possible about your house!
- Ask questions. It is good to understand what they are doing and why. This will help you better understand their report and recommendations.
- Point out problem spots, places you know that are cold in winter and hot in summer.
- Be hospitable. You may want to offer something to drink or a snack, and make sure to point out where the bathroom is. An audit can last four hours, and sometimes nature calls.

After the audit
- Ask your auditor when you will receive a written report and confirm it will have the information you requested (e.g. heat load analysis). See the section below on the Energy Report to help you with this conversation.
- Ask any other questions that may have come up during the audit. If the auditor does not have enough time then to answer them all, ask when would be a good time to follow up.

**III. The Report & Proposed Work**
Your contractor should send you a written report within two weeks of the audit by email or by mail, and should go over the report with you either on the phone or in person. The document should contain two parts: A) a report on your home and B) a list of proposed improvements.

A. The Report
Think about the report as your home’s “bill of health”. It should include information about any safety issues that need to be addressed first, such as gas leaks, asbestos, etc., as well as information about the energy-efficiency of your home and equipment. If requested, it should also include an estimated current heating demand of your home (from a heat load analysis).

Here are two other things we recommend you ask your auditor to include explicitly in the report:

- **1. How tight is your home?** Ask them to provide this to you in ACH\textsubscript{50} (the number of air changes per hour in your home at 50 pascals of pressure), the standard measurement used across the country to compare homes. Use the chart below to compare your home with others, and with where you’d like to be. For home retrofits, Get Your GreenBack recommends reaching at least 7 ACH\textsubscript{50}.
2. How insulated is your home? Wall and ceiling insulation is expressed in terms of R-value, with higher numbers meaning better insulated. Compare yours with the chart below for the recommended levels for homes in Tompkins County as prescribed by the US Department of Energy’s Energy Star program. Window insulation, so to speak, is expressed in terms of U-value, which is the inverse of R-value, and lower numbers are better. A double-glazed\(^3\) new window may have a U-value of 0.35, which is equivalent to R-3. Considering that walls are supposed to be insulated to R-15 or R-20 in our region, you can see that even efficient windows still lose significant heat. Caulking and fixing old windows and installing storms may often be a wiser financial decision than installing replacements.

<table>
<thead>
<tr>
<th>Surface</th>
<th>Insulation Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling R-value</td>
<td>49</td>
<td>~14 inches of blown cellulose</td>
</tr>
<tr>
<td>Walls, including basement and crawl space, R-value</td>
<td>15-20*</td>
<td>Depending on type of wall and placement of insulation</td>
</tr>
<tr>
<td>Floor R-value</td>
<td>19-30*</td>
<td>30 is recommended; 19 is minimum to fill framing cavity</td>
</tr>
<tr>
<td>Slab R-value</td>
<td>10</td>
<td>R-5 to be added to slab edge, to 4 ft depth</td>
</tr>
<tr>
<td>Windows (fenestration) U-factor</td>
<td>0.35</td>
<td>~R-3; U-value is inverse of R; lower numbers are better</td>
</tr>
<tr>
<td>Skylight U-factor</td>
<td>0.60</td>
<td>~R-2</td>
</tr>
<tr>
<td>Windows SHGC</td>
<td></td>
<td>Solar Heat Gain Coefficient (NR in Climate Zone 6?)</td>
</tr>
</tbody>
</table>

B. Proposed Improvements
The report should include a list of proposed improvements or scope of work, a quoted cost for each improvement, and an analysis of its cost-benefit ratio, that is, how much would you save in energy as a result of each investment.

\(^3\) A double glazed window has two layers of glass with a small air-space between the two glass layers. This makes the window much more efficient than a window with just a single layer of glass.
We recommend you ask your contractor to include in your scope of work what it would take to reach your targets for air tightness and insulation—that is, what it would take to reach $7 \text{ACH}_{50}$ or better, and the insulation levels referred to above.

Even if you don’t or can’t do the proposed work immediately, it will be good for you to have a sense of the improvements needed to reach these targets, and to think about getting this work done over time. Increasing wall insulation, for example, may sometimes be done more cost-effective when replacing siding; changing a roof may provide an opportunity for increasing insulation in a cost-effective manner as well. Making progress towards these targets is also necessary for our community to reach its goal to reduce carbon emissions by 80% by 2050.

Here is a list of additional things to ask and look for in your scope of work:

- At least two insulation options for you to consider, including an analysis of how increased insulation and air sealing would impact heating system size and cost of your project.
- The general location inside your home where work is proposed to be done.
- A list of all major new equipment (manufacturer/model) proposed, and the depth and expected R-value of any proposed insulation.
- Pricing and details for the equipment and/or the insulation/air sealing products.
- Pricing detail for any expected electrical, mechanical, or structural considerations that are beyond the basic insulation and air-sealing scope.
- A statement of available incentives and/or tax credits that you may be eligible for to reduce the overall cost of your project.
- The estimated energy and cost savings from at least two proposed package options.
- At least one financing option for each proposed package, including the interest rate, term, and resulting monthly payment.

IV. Deciding on Work
Once you receive your report, how do you decide what to move forward on? Here are some thoughts to consider.

Not sure what to prioritize or where to start?
- Ask your contractor what makes most sense, and what will contribute most to your comfort and energy savings. If finances are an issue, look at the investments that have the shortest payback period.
- Look at the incentives and see what improvements are covered by the incentives
- Get in touch with an energy advisor from Get Your GreenBack Tompkins. They can help coach you through the decision-making process.

The work seems expensive
- First off, it may be helpful to know that home performance is not a lucrative industry. Our Contractor Partners are not driving Cadillacs around. Reaching all those difficult-to-access places in your home and doing a good job takes time, care, equipment and expertise.

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4 Slightly modified list from HeatSmart Tompkins
There are significant overhead costs to running a safe, reputable and successful business. All the GreenBack Contractor Partners are paying living wages to their employees. Cheaper does not necessarily mean better. Know that your money will be supporting local jobs, and strengthening our local economy (in contrast to your fuel bills, where most profits go to large, wealthy companies and investors far-far away).

✓ Remember that the benefits go beyond your pocketbook. They help improve the comfort of your home, and will likely increase its resale value. Efficiency improvements also contribute to greenhouse gas reductions. Your little bit may not make seem to make a difference; however, a significant percentage of homes in Tompkins County have done this and each new one is helping us move towards our community’s goals.

✓ If you want to get a sense of what energy efficiency work typically costs, you can check your contractor’s quote against the below-market pricing in the HeatSmart program (see www.solartompkins.org). You can also get a quote on the improvements you are considering from another contractor or two.

✓ Try financing. Sometimes your energy savings can cover your monthly loan payments so you end up paying no additional cash. Find a list of local low-interest financing options at www.getyourgreenback.org.

✓ DIY? If you are handy, you may be able to do some of the more straightforward jobs like caulking around windows and doors, or installing weatherstripping. But these are generally smaller investments anyway, and the pros often have tricks of the trade that improve the quality and durability of the work. CCE-Tompkins has a manual to help you with some projects you can do that can help you save some money on your bills.

Not sure you want to work with the contractor that did the audit?

✓ Contact another contractor. Let them know your situation. They may have to perform another audit, which they may have to charge you for, but the investment is worth it if it means you end up with a contractor you feel comfortable working with.

You don’t have to do everything all at once
Remember you can choose which of the improvements to start with. While we encourage you to do as much as you can, we also want you to do those things that make sense to you.

V. Getting Work Done
Signing a Contract
Here are some things to include, or consider including, in the contract:

☐ Scope of work, including the location of work, the type (efficiency, R-value, etc.), the features (e.g. the kind of programmable thermostat), and the testing to demonstrate they were installed correctly.

☐ You may want to ask for a work schedule, especially if you have scheduling constraints which limit your availability. You may want to be there to check on the work and ask questions. If you see something doesn’t look right be sure to ask and they’ll be happy to explain to you.

☐ The cost of each improvement, the incentives that are available to cover some or all of the costs, and who is responsible for applying for these incentives.
The payment requirements, including how much you have to pay up-front (if any) or at the end of the job.

Who is responsible for clean-up

Process for dealing with changes, which are sometimes unavoidable. For example, a contractor may discover stuff inside the walls that would prevent him or her from doing blown in insulation as described, and may require additional work and cost to deal with the issue. Deciding beforehand on a process for proposing and addressing these changes will help things go more smoothly.

Communication protocol - establish the lead person for you to communicate with

Do you need a building permit for the work? If so, who gets it and who pays for it?

**Remember that if it is not written in the contract it is not part of the contract.** Make sure any changes you discussed with the contractor get entered into a revised contract.

Aside from the contract, there will likely be other forms that you will have to fill out and sign in order to claim the various incentives available. The contractor should guide you through this process.

**Pre-Construction Meeting**

It is useful for you to hold a pre-construction meeting with your contractor, in order to go over the work scope and audit to make sure you are on the same page. This will generally happen on the first day of the job, before they begin construction. In addition, you may want to specify any additional concerns such as:

- Where to park and store materials
- Which bathrooms to use
- Any pet concerns. Contractors may be concerned with having them loose in the house; you may be concerned about them getting out when contractors come in and out of your house.
- You may want to review your main priorities in the project, e.g., scheduling, not destroying your lawn, cost, quality, etc., and discussing realistic expectations for these with them.

**During Construction**

- Set aside some time each day to inspect the work they are doing and ask questions. Let them know you will be doing this. This will enable you to address issues as they come up, which is best for both you and the contractor.
- If you are purchasing specialized equipment, such as a pellet boiler, or air-source heat pump, as part of this work, make sure you include time in your schedule for this to arrive.
- A little hospitality may go a long way in helping make the communications and work go smoothly. Why not provide some drinks and snacks?

**Closeout**

- Generate a “punch list” - a list of things on the work scope that need to be completed for you to be able to pay the contractor. Assume that the last 10% of work is the hardest, with small tasks that may take longer than expected. Withholding payment until the work has
been completed is common practice; 20% is a reasonable amount to hold onto until all the items on the “punch list" are done.

VI. After the Work is Done

Share the good news.

If you appreciate the work of the contractor, why not write up a positive review on their website, send them a note, and post something on your Facebook page, if you have one. Let them know you will be happy to do this. Celebrate your accomplishment with an energy party! Talk it up with your friends, family and neighbors. Insulation and air sealing are virtually invisible improvements compared to solar, for example. People are much more likely to get an audit and pay for improvements if they hear from you and your positive experience.

We would be happy to share positive stories that highlight this work on the Get Your GreenBack newsletter and media. Please let us know if you are open to this possibility.

Quality Control & Dispute Resolution

What to do if after the work is done you have concerns about the work?

- Your first step is to call your contractor and discuss your concerns with them. They should be able to address any issues, returning to your home if necessary to make things right.
- You may also contact GYGB and request a visit from our Energy Coach. He can provide a third-party opinion which may be useful to help allay or resolve your concerns, and may be able to speak with the contractor and help resolve the issue.
- If you still feel unsatisfied with the work, you can request a quality assurance visit from the organizations that supervise the various energy audit and home performance programs.
  - For any work done under any of the NYSERDA-sponsored programs (EmPower NY, Home Performance or Assisted Home Performance), contact Honeywell, the company that does quality assurance for the programs, by calling 855-522-8210.
  - For work done under the federal Weatherization Assistance Program, contact Daniel Grau, Weatherization Program Field Representative, NYS Homes and Community Renewal, 620 Erie Blvd. West, Suite 312, Syracuse, NY 13204, (315) 478-7179 ext. 203.
- In addition, for any work done under NYSERDA’s programs (EmPower NY, Assisted Home Performance with Energy Star and Home Performance with Energy Star), you can initiate a dispute resolution process with NYSERDA. This should be used as a last result, after exhausting all other options.

Disclaimer

This guide is intended as a resource to help you gather useful information necessary to make good decisions with regards to making your home more energy efficient, and to encourage a positive interaction with local home performance contractors. However, no process is foolproof. While Get Your GreenBack Tompkins is happy to provide information to help with decision-making, we can’t accept liability for decisions made or contracts signed. Please proceed with the diligence and care required of any significant decision that will impact your finances and your home.