



Piedmont
Environmental
Council

EnergySmart Solutions



SAVE **ENERGY.**  SAVE **MONEY.**  SAVE **OUR PLANET.** 

Save 20% or more on your energy bills in 10 easy steps...

Want to reduce your utility bills, use less energy and help improve the environment—all at the same time? The Piedmont Environmental Council (PEC) is pleased to bring you this exciting new guide that can help you achieve all of these benefits. By making just 10 changes in your home or apartment, all of them easy and inexpensive “Do-It-Yourself” projects, you can save about 20 percent—and maybe more.


The items in this guide have been specifically selected for many of you to be able to do them yourselves. No special tools

or expertise is required. Our new **EnergySmartSolutions.org** website includes more information, including materials lists and short how-to videos that take you step-by-step through many of the energy efficiency improvements listed in this guide.

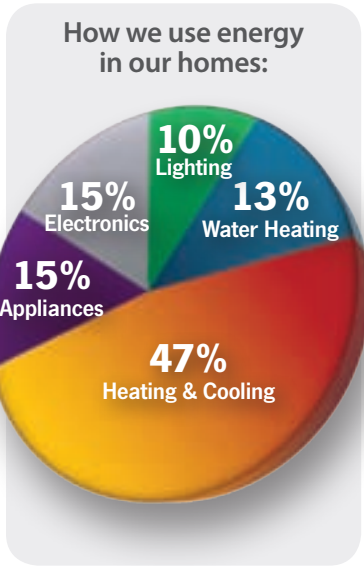
But if you are unable to do these projects yourself or are uncomfortable doing projects that involve electricity or using ladders, for example—or if you simply don’t have the time to devote to doing these projects—many “handyman services” and HVAC and electrical contractors can provide the services you need.

These energy improvements apply to just about everyone; *Homeowners*, for certain. *Renters*: you can make many of these changes yourself and save money. *Landlords*: these improvements can make your property more attractive to renters who are increasingly looking at their utility costs. If you’re *building a new home*, the items in this guide will make your home “greener” and save money from day one. *Businesses, schools, churches, government buildings*: the list applies to you too. It doesn’t matter whether you use electricity or natural gas—these improvements can make a difference for you.

So use this guide and get started by making these changes—and save energy, save money, and help save our planet.



Visit **EnergySmartSolutions.org** for how-to videos of many of the projects featured in this guide.



Discounts Available!

You can **\$\$\$ SAVE \$\$\$** on the materials needed for projects in this guide, thanks to discounts offered by some participating local retailers. Get the details at our website:

www.EnergySmartSolutions.org

For a one-time cost of about \$500, you can achieve **annual savings of about \$375** in the first year, and higher levels in the future...

1	Light Right.	Replace old incandescent bulbs with compact fluorescents (CFLs) in the lights you use most frequently. <i>See page 2.</i>	\$100
2	Warm Water Well.	Put an insulating blanket on your water heater and install low-flow shower heads and faucet aerators. <i>See page 2.</i>	\$50
3	Program Your Comfort.	Install a programmable thermostat and better manage your heating and cooling. <i>See page 2.</i>	\$60
4	Add a Blanket.	Upgrade your attic insulation by adding a layer of loose cellulose to improve performance. <i>See page 3.</i>	\$100
5	Put a Hat on It.	Properly insulate your pulldown attic door or hatch. <i>See page 3.</i>	\$20
6	Defeat Drafts.	Seal openings around windows and doors with caulk, spray foam and weatherstripping. <i>See page 3.</i>	\$35
7	Go with the (Air) Flow.	Change the filters in your heating and cooling systems every three months. <i>See page 4</i>	\$20
8	Follow the Sun.	Close southern and western facing blinds in summer months, but open them in the winter to naturally heat your home. <i>See page 4.</i>	\$15
9	Dial it Back a Notch.	Change the settings on your appliances to save energy costs. Wash your clothes in warm or cold water and adjust your refrigerator and freezer temperatures. <i>See page 4.</i>	\$35
10	Kill the “Phantoms.”	Plug TVs, computers, and other electronics or appliances into powerstrips you can turn off when not in use. <i>See page 5.</i>	\$25

Where else can you get a 100% return on your investment in about 16 months?

Total Savings:
\$375 per year*

* Estimates of projected savings were calculated using data from several sources, including VA DMME, Energy Star, and the EIA. Your home energy savings will depend on many variables including the size, age and condition of your home, weather conditions, changes in utility rates and other factors. Total savings level shown adjusts for interactions among individual items.



1



Light Right.

Switch to CFLs in the lights you use most frequently.

Savings per year	Initial Cost	Payback Period
\$100	\$35	4 months

Anybody can change a light bulb. That's all it takes to get major savings in your lighting costs. CFLs use 75 percent less energy than incandescent light bulbs, last up to 10 times longer, are reasonably priced, and provide a quick return on investment. CFLs fit a wide range of standard light sockets and are available in various hues, including "soft white" that most

people have now. You'll even reduce your air conditioning costs, since CFLs don't heat up like incandescent bulbs. An average household spends nearly \$200 on lighting costs every year, mostly for the few lights that are used most frequently. So switching those bulbs to CFLs is the place to start: find the ten lights you use most, and all the lights you use at least one hour per day, and make the change. If every home in America replaced just one incandescent light bulb with an ENERGY STAR qualified CFL, we would save enough energy to light more than 3 million homes and prevent greenhouse gas emissions equivalent to that of 800,000 cars.

FAQs about CFLs:
Is there a delay when CFLs are switched on? **Not anymore**, although some do take a few minutes to reach their full output.
Do they come in all the shapes and sizes I need? **Yes**, including flood lights and candelabra shapes. Even dimmable bulbs are now available.
How do I need to handle and dispose of used or broken bulbs? Because CFLs contain trace amounts of mercury, it is important to follow proper practices for the use, recycling and disposal of these products. Put them in a bag and return them to recycling centers or to retailers that offer collection services.

www.EnergySmartSolutions.org



Visit www.EnergySmartSolutions.org/CFL for an in-depth chart of shapes and sizes, more details on handling and disposal, and related information—even a video.

2

Warm Water Well.



Save energy by helping your water heater work more efficiently.

Savings per year	Initial Cost	Payback Period
\$50	\$75	18 months



Water heating costs the average Virginia household about \$250 per year. That water heater tank hidden in your closet or down in your basement is working non-stop to keep the water warm and to heat up the cold water that refills it after each use. You don't need to switch to cold showers to save money—you can reduce your costs by up to 20% by taking a handful of simple steps:

- 1. Check the thermostat on your water heater** to ensure that it's not hotter than it needs to be—120 degrees is plenty hot.
- 2. Wrap your hot water tank** with an insulating blanket and wrap the hot water pipes with insulating tape or foam. These materials are available at hardware and home improvement stores, and it takes just a few minutes to do.
- 3. Install modern "low flow" heads** on your shower and aerators on your sink faucets. These efficient fixtures are easy to install—just screw them on—and they use less than 1.5 gallons per minute, vs. 2.5 or more for older models.



These projects are all detailed in how-to videos at www.EnergySmartSolutions.org/waterheater

Did you know? New water heaters are much more efficient than older generations. An average water heater will last about 10 years, so when it's time for a replacement, look for the EnergyStar label to ensure you are getting the most efficient one. New types of "tankless water heaters" that produce hot water only when you need it may also be worth a look. These are commonly used in Europe and are a sensible alternative to keeping a full tank of hot water on hand at all times, even when you're asleep or away.

3

Program Your Comfort.

Get the most out of your heating and cooling system with a programmable thermostat.

Savings per year	Initial Cost	Payback Period
\$60	\$50	10 months




Why leave your heat or air conditioning on full blast even when you're not at home? Heating and cooling costs are the largest single component of your utility bill, costing the average Virginia household about \$900 per year. By installing a programmable thermostat you can manage your home's temperature to suit your daily schedule—and save a bundle as a result.

Programmable thermostats now have features such as voice and phone programming, vacation options, and indicators alerting you that it's time to change air filters or if part of your system is malfunctioning. The savings you achieve depends on the temperature settings

you select. Some experts estimate you could reduce your heating and air conditioning bill by 20 percent, but even with much more modest levels, the savings you achieve pays back the costs of buying and installing a programmable thermostat in less than a year.

Some experts estimate that using a programmable thermostat can **save 20%** on your heating and air conditioning bill.

www.EnergySmartSolutions.org



See www.EnergySmartSolutions.org/thermostat for a how-to video about doing this project yourself, and for some important tips about how to make sure that your heating and A/C system is appropriate for use of programmable thermostats.



4

Add a Blanket.

Sufficiently insulate your entire attic with loose cellulose.

Savings per year	Initial Cost	Payback Period
\$100	\$175*	21 months
*after 30% federal tax credit		

What is R-value?

It is a measure of the ability of a material to “resist” heat flow, sort of “how well it functions as a blanket.” The higher the R-value, the greater the insulating value. Depending on the material, insulation has an R-value of 3 to 4 per inch. Full and uniform coverage is absolutely critical. A level of insulation that would otherwise be “R-38” but that does not cover the attic joists or has various small gaps or holes (equal to 3 percent, say) actually functions as just R-20 insulation—losing nearly half its value.



Upgrading your attic insulation can dramatically reduce your heating and air conditioning costs, improve the value of your home, and add to

your day-to-day comfort. While this project may cost you \$200 or maybe more, once it’s in place it will allow you to save money on your energy bills forever. Insulation is the largest single cost item in this guide, but it’s a fundamental building block for energy efficiency, and helps ensure that you reap the full savings from the other actions in this guide.

In Virginia’s climate, attics should be insulated to at least the “R38” level, and most houses have less than they need. With either fiberglass bats or a layer of loose fill cellulose, there should be at least 12 inches of insulation. A good rule of thumb is that you should be able to see only the top of the attic joists if you have fiberglass, and not see

them at all if you have cellulose.

Adding loose cellulose insulation is easy and it will fill in any gaps you have in the existing insulation. Machines to “blow it in” to your attic are available for use at many home centers (for details and an instructional video on this project, visit www.EnergySmartSolutions.org/insulation). With a minimum purchase, there is often no charge for using the machine. Cellulose is basically ground up newsprint, so it’s an environmentally friendly choice too.

Good news: insulation material qualifies for a 30% federal tax credit. Thank you, Uncle Sam!



5

Put a Hat on It.

It’s important to insulate your attic door or hatch.

Savings per year	Initial Cost	Payback Period
\$20	\$25	15 months

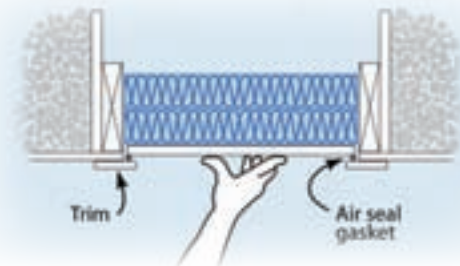
Your attic door or hatch is the place you use to get into your attic. In most homes it’s a framed plywood square in the ceiling of a hallway or bedroom, with no insulation above it. This is like having an open door to the outside, or an open fireplace flue: your heat can go right out through the opening—adding to your heating costs all winter long. Even after you have upgraded your attic insulation, the

attic hatch is still a “weak spot” that costs your money.

It’s easy to fix this problem: simply apply a piece of insulated foam board to the back of the door or hatch and add weatherstripping to the frame. The materials are cheap, widely available and easy to work with, and the project takes half an hour to do. At a total cost of about \$20, this project pays itself back in about 8 months—and

gives you ongoing energy savings for the life of your home.

A ¼” gap around the perimeter of an attic access can potentially leak the same amount of air supplied by a typical bedroom heating duct.



www.EnergySmartSolutions.org

See www.EnergySmartSolutions.org/attichatch for a great how-to video for doing this simple and valuable project.



6

Defeat Drafts.

Seal gaps and cracks around windows and doors with caulk or weatherstripping.

Savings per year	Initial Cost	Payback Period
\$35	\$75	2.1 years

Ever notice the draft coming from your windows or doors? Put your hand up next to an electrical outlet and you may also notice air moving. The outer walls, ceiling, windows, doors and floor all make up the “thermal envelope” of your house. Any gaps or holes in this envelope allow the conditioned or heated air inside your house to escape. When you add up all the small gaps, holes, cracks, leaks and all the rest, it’s often the equivalent of leaving a couple of windows wide open ... all the time.

You can easily tighten up your house and save money by using various simple and effective insulating materials: silicone caulk for gaps in baseboards and window frames,

expanding spray foam for bigger gaps, felt weatherstripping around doors and windows, and pre-cut foam pads around electrical sockets.

Be a detective. Finding your draft problems and solving them will pay off on your electricity bill.



Did you know?

Winter is the best time to find leaks in your home because you can feel the cold air moving. But in any season, you can find problem areas by running a burning incense stick around windows and doors and watching the smoke.

See www.EnergySmartSolutions.org/weatherstripping for tips, videos and more information.



7

Go with the (Air) Flow.

Keep your heating and cooling equipment running efficiently...change your air filters every three months.

Savings per year	Initial Cost	Payback Period
\$20	\$10	6 months



www.EnergySmartSolutions.org

See www.EnergySmartSolutions.org/filter for a how-to video on this quick and easy task—anybody can do it!

Periodically replacing your air filter will significantly improve your heating and cooling system's performance. When the filter is dirty, the fan uses more energy to force the air through. When the filter gets too clogged up, the whole system can shut down—triggering the need for professional service costing hundreds or possibly thousands of dollars.

Experts recommend that you change the filter every three months.

It only costs a couple of bucks—and pays for itself almost immediately. The filter is normally located in a pull-out tray either in the main unit or in the ductwork near the unit. Most furnaces use disposable paper filters, but some filters can be cleaned and reused. Also, regularly clean registers where air is supplied and returned throughout the rooms in your house, while clearing obstructions from any baseboards, radiators, or vents. Not only will you save money and help avoid costly repair bills, you'll be breathing cleaner, healthier air, too.



Did you know?

The technology for heat pumps has improved significantly over the years, so that now most heat pumps are well-suited for Virginia's climate. If you are in the market for a new heating and air conditioning system, these can be a good option. Look for a high SEER number, which is the key measure of energy efficiency.

8

Follow the Sun.

Adjust window blinds or curtains to naturally heat or cool your home in any season.

Savings per year	Initial Cost	Payback Period
\$15	\$0	Immediate



Here's a simple and **zero cost** way to reduce home energy costs: use your existing window blinds to help maximize your comfort, changing and adjusting them with the season. In the winter, open the binds on the windows that face south to let some sunshine and heat in during the day, and then

close them at night. In the summer, be sure to keep the blinds and curtains on the south side of your house closed to protect against the sun's rays heating up your otherwise nicely air conditioned interior. You'll save money on your heating and cooling bill, and adding natural (and free) light to your house

in the winter will also reduce your electric bill. In much of the spring and fall, you can turn off your heating and cooling system entirely—open your windows and use natural fresh air to provide a comfortable temperature in your home.

Did you know?

New windows are much more efficient than ones from a generation earlier—double panes, gas filled elements, reduced solar gain—the list of features is extensive, but so is the price. If you're building a new house or renovating an old one, these are worth learning about—and a 30% federal tax credit also applies. You can also enhance the insulating ability of the windows you already have at a very modest cost. Hardware stores and home centers carry do-it-yourself window film kits that will help your windows keep heat inside during the winter, and there are some new products that can help reflect the sun's rays back to the outside during the summer. See www.EnergySmartSolutions.org/windows for more details.



9

Dial it Back a Notch.

Cut the energy you use for major appliances and still get the job done.

Savings per year	Initial Cost	Payback Period
\$35	\$0	Immediate



Your kitchen appliances are wonderful modern conveniences—but they cost the average Virginia household over \$200 per year to operate. You can save 10% or more on these costs through two easy steps, without any appreciable effect on your day-to-day lifestyle or comfort.

Switch to warm or cold water settings on your washing machine, rather than hot. This simple change will greatly reduce your costs with every load. Check the labels—delicates, colors and many other types of clothes and fabrics recommend using warm or cold water. New detergents are also available that are specially designed for cold water washing.

Set your refrigerator and freezer to the manufacturers' recommended settings. The dials are often set at levels that are "too cold," making the unit work harder and use more electricity than necessary, all day long. The U.S. Department of Energy recommends maintaining a temperature between 37 and 40 degrees in the fridge, and 5 degrees in the freezer compartment. Consult your owner's manual for more details. Also make sure that the door seal is tight—if you can slip a piece of paper through the edge then you need to adjust or replace it.

Did you know?

Filling a milk jug or two with water and keeping it the back of the refrigerator provides extra cooling that keeps the temperature stable and reduces the need for additional cooling and electricity use.

Modern clothes dryers have an "Optimum Dry" feature that will automatically turn off the dryer when the clothes have gotten "dry enough." No more tumbling them and heating them to a crisp.



10

Kill the “Phantoms.”

Unplug electronics that use energy even when you’re not using them.

Savings per year	Initial Cost	Payback Period
\$25	\$30	14 months



See a Kill-a-Watt device in action: Also known as Watt’s Up, it’s a meter that tells you how much electricity your appliances and electronics are using, even when they are “off.” Energy auditors use them as part of energy efficiency reviews for homeowners. You can see one in action at www.EnergySmartSolutions.org/phantom...the results are ‘shocking.’



Electronics and miscellaneous appliances is now the second largest category of home electricity usage—nearly \$300 for an average household. Some experts estimate that up to 75% of these costs are for “phantom power”—situations where these devices are using electricity *even when you think they are “off.”* Often (but not always) that

little green light that is still glowing is a tip-off. A typical television in “standby mode” is still drawing about 60 watts of power. That’s the same as leaving a standard incandescent light bulb on—all day and all night long. It’s easy and inexpensive to significantly reduce these phantom costs in your own home. Plug your

electronics into power strips and use the on-off switch on the power strip to fully turn off the power when you are not using the electronic device or appliance. Even better, by selecting power strips that are also “surge protectors” you’ll help prevent your valuable electronic devices from getting fried in electrical storms or power spikes.

Top culprits for “phantom” electricity usage:

- Televisions
- VCRs
- Cell phone chargers
- Computer monitors
- Printers
- Video game consoles

It’s not Just for Homeowners

The items in this guide apply to a wide variety of situations.

Renters: You can change to CFLs, use power strips, switch to warm and cold water washing, and open and close your blinds, for example, and can discuss additional changes with your landlord. When you’re looking to move, you can use this guide to help you assess the energy efficiency, and relative utility costs for different apartments or rental houses.

Go to www.EnergySmartSolutions.org/checklist for a handy checklist you can use.

Landlords: By increasing energy efficiency, you can make your units more attractive to potential renters, especially with so many people becoming more energy conscious. And, you’re eligible for many of the tax credits and energy efficiency incentives that are available to reduce the costs of making improvements.

Offices: You can benefit from these improvements too—whether you rent the space or own it, where else can you quickly and cost-effectively reduce your operating costs by 20 percent? Some of the improvements can be even more beneficial—CFL lighting and setback thermostats for offices that are not occupied in evenings and on weekends, for example.

Factories, schools, churches, government buildings: Any place that heats, cools, uses hot water, has electronics and appliances, and pays a utility bill can benefit from implementing the items in this guide.

Tax Credits and Other Government Assistance

The energy efficiency improvements in this guide are all simple, low-cost projects that pay for themselves quickly. The savings alone provide plenty of incentive to make them worth doing. But there are also numerous programs available through federal and state governments, utility companies and other sources that can help consumers become more energy efficient.

- Virginia has sales tax credits and sales tax “holidays” for purchases of various energy-efficient products and appliances.
- Federal tax credits are available for home-shell improvements such as new windows, renewable energy technologies such as geothermal heat pumps and solar panels.
- Utilities are increasingly offering discounts on CFLs, energy audits, and other assistance.
- Local governments and nonprofit groups offer a wide range of home weatherization programs, energy audits, loans and other assistance.



Eligibility, rules and detailed provisions associated with these programs vary, and can be complex. For more information, visit www.EnergySmartSolutions.org/programs

We want to hear from you!

Please go to www.EnergySmartSolutions.org/getstuff and take our quick survey about your experience in making these changes and get a great bumper sticker. We will share the survey results and the latest developments, technologies and news relating to home energy efficiency with you.



Call in the Pros

If you own an older building, have a unique situation or want to learn more about your home’s performance, a **Home Energy Audit** can be a good investment. For a few hundred dollars, you can get a whole-house walk-through assessment and recommendations from a Certified Energy Auditor. For additional charges, more detailed tests and analyses can help pinpoint specific energy weaknesses in your home. Visit www.EnergySmartSolutions.org/audit for detailed videos of a recent energy audit in Charlottesville.



Many people will be able to do the projects in this guide themselves but if you unable or uncertain about what to do, then *call in the pros* to do the work—handyman services and contractors are widely available to assist you with these improvements.



Want to do even more?

There are lots of other energy efficiency upgrades you can make—from installing ceiling fans to planting shade trees to using a humidifier. All of them can make a small difference, but the ones listed in this guide all share the benefits of being low cost, easy to do, effective in reducing costs, and providing a strong and quick financial payback. Is it time to modernize your house? Replacing old “energy guzzling” appliances such as washers, dryers, refrigerators, freezers, and water heaters can provide significant savings. Upgrading your heating and air conditioning systems can dramatically improve efficiency. Replacing those old drafty windows can tighten up your home too. Look for the EnergyStar certification to ensure you’re

choosing the most energy efficient products. These represent “medium cost” actions that still have a strong payback. Want to be on the “leading edge?” New technologies such as solar panels, solar water heating and micro-wind generation offer an alternative to conventional power sources. Ground source geothermal can significantly reduce your heating and air-conditioning costs. For improvements like these, out-of-pocket costs can be high and the “payback period” is longer term, even after substantial tax credits that are available, but these technologies provide the largest potential savings and are among the “greenest” overall solutions.

For more information on these and other options, check out www.EnergySmartSolutions.org/domore.



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SAVE **ENERGY.**

SAVE **MONEY.**

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Energy Smart Solutions



10 low-cost, do-it-yourself projects that can **save you money...** starting today!



\$\$\$ SAVE \$\$\$

Visit our website to receive discounts on energy-saving materials from participating local retailers.

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This guide, and the companion website www.EnergySmartSolutions.org, have been brought to you as a **public service** by the Piedmont Environmental Council.



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The **Piedmont Environmental Council** safeguards the Piedmont's landscapes, communities and heritage by involving citizens in related public policy and land conservation.



Energy • PEC works to promote energy efficiency and encourage local generation utilizing smart 21st century technology, and opposes unnecessary new transmission lines carrying coal-fired power through the Piedmont.

Land • PEC leads one of the most successful private land conservation movements in America, with over 300,000 acres of land protected in nine counties! To see a map of protected lands near you, visit www.pecva.org/protected.



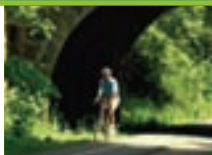
Food • PEC is helping to grow the local food movement through our *Buy Fresh Buy Local* food guides, which we send to all 250,000 homes in our region. PEC has also helped to start new farmers markets and offers resources and support for local farmers.

Water • PEC keeps rivers and drinking water clean by protecting natural systems—with 1,300 miles of waterways and 150,000 acres of forests (vital for clean water) protected so far. PEC also promotes healthy urban watersheds and riparian buffers on farms.



History • PEC recently helped to protect Jefferson's Montalto (looking down on Monticello) and Madison's Montpelier with conservation easements. We have helped to protect Civil War battlefields, including Rappahannock Station, Brandy Station and Mine Run.

Better Communities • PEC works with citizens to achieve smart growth in our communities—great places to live, work and play, with efficient transportation networks, plenty of parks and trails, and a healthy balance between city and country.



PEC makes the connections to protect the Piedmont.

Become a member or sign up for PEC emails: www.pecva.org • 540-347-2334



Connect with us on:



www.pecva.org/socialnetwork

According to the National Academy of Sciences, full deployment of cost-effective, energy efficient technologies in buildings could reduce electricity consumption 25 to 31% by 2030, entirely offsetting the need for new power plant capacity. So instead of spending billions on new generation, by weatherizing our homes we can help **strengthen our nation's energy security and economic competitiveness, all while helping to save money, reduce emissions, and preserve the beauty of our Piedmont region.**

— Chris Miller, PEC President

More to come: Local Energy Alliance Program (LEAP)

Residents of Charlottesville and Albemarle can qualify for in-depth audits, comprehensive contracting help, and financing assistance. Visit www.va-leap.com for more details.

Become a Member of PEC

PEC membership is an investment in your community

- ☐ **\$25 Basic One-Year Membership**
All PEC members get the Piedmont View newsletter and invitations to PEC events
- ☐ **\$50 One-Year Membership**
A \$50 membership comes with a copy of the beautiful coffee table book *Hallowed Ground*, full of stunning full-color photographs of the Piedmont.
- ☐ **Other Gift**
We appreciate all donations, large and small



PEC members receive our newsletter and (at the \$50 level) a stunning *Hallowed Ground* book

Yes! PEC can count on my (our) support.

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