

If you've determined it's time to replace your air conditioning system, you know that as you begin researching the best new options available, you're presented with a dizzying array of choices. Terms such as tonnage, SEER, and load capacity are discussed, and you don't understand any of it, so, you're just going to trust that the local AC repairman you called is going to sell you the best unit for your home. *Hold on...* purchasing a new air conditioning system is a huge investment!

Depending on where you live, the lifespan of an AC unit could last 10-15 years. Besides the upfront cost of a new unit and installation, the type of system you purchase will affect your monthly utility bills over the course of that unit's lifetime. That's 10 to 15 years' worth of utility bills coming out of *your* wallet. The decision to purchase a new AC system is not one to be taken lightly, nor handed over to someone who may not have your best interests at heart.

Doing your due diligence to research the different types of air conditioning units is not only your responsibility as a conscientious consumer, but it's also not that difficult. Here at Pricefixer.com, we believe in educating consumers, so they can make the best purchasing decisions for their home and their budget.

The Definition of SEER

Let's start with the basic question: What is SEER? The short and simple explanation of SEER is that it's a number assigned to an AC unit indicating its energy efficiency. The higher the SEER number, the more energy efficient the system is, which is important because an energy-efficient unit will not only reduce your monthly utility bills, but will also reduce your carbon footprint, thereby benefitting the environment. Naturally, then, it would make sense to purchase an AC unit with the highest SEER rating available, right? Well, not necessarily. As we explain a little more about the SEER rating, you'll understand why a high-rated SEER unit may not be the right one for you.

S-E-E-R – Breaking it down

SEER stands for "**S**easonal **E**nergy **E**fficiency **R**atio." The key word to remember in this acronym is "Seasonal," as the SEER number is determined by measuring an AC unit's efficiency as it operates over a *period of time* with varying degrees of temperature and humidity levels, which mimic a typical summer season for most areas in the U.S. This is typically referred to as the "cooling season."

SEER ratings are calculated by measuring the amount of cooling provided (energy output, measured in BTU's), during a cooling season and dividing it by the amount of energy consumed (energy input, measured in watts), over this same period of time. An AC unit that uses less energy to produce the same amount of cooling than another unit

over the cooling season, operates more efficiently and will have a higher SEER number. Of course, the higher the SEER number, the more expensive the unit, but oftentimes the savings recouped from a more energy-efficient unit make up for the higher upfront cost. For example, if you replace a SEER 10 unit with a SEER 13 unit, then the same amount of cooling will be produced while using 30% less energy! That's a 30% reduction in harmful emissions and a 30% reduction in your utility bill. If you have a unit with a SEER rating that's less than 10, and you upgrade to a SEER 13, or higher, then the energy and cost savings will be even greater.

When shopping for a new AC unit, the **SEER** rating is an important piece of information that allows you to compare the energy efficiency of air conditioners and help determine an AC unit's approximate annual operating costs.

SEER vs. EER

Oftentimes alongside the SEER rating, you will see an **EER** rating. **EER** stands for "**E**nergy **E**fficiency **R**atio" and is a number that measures an AC unit's energy efficiency at a specific temperature, instead of over a period of time with different temperatures (hence, no "S" for seasonal). EER was created in 1975 by the Air Conditioning, Heating & Refrigeration Institute (AHRI) as a way of measuring the cooling efficiency of HVAC units. To determine the EER rating, the amount of cooling provided (energy output) is divided by the amount of energy consumed (energy input) while operating under a singular set of weather conditions, which is typically an outdoor temperature of 95°F, an indoor temperature of 80°F, and a humidity level around 50%.

Realizing that the EER rating doesn't take into account certain variables, such as seasonal weather fluctuations and the resulting heat loss or gain that occurs when a system frequently cycles on and off, the **SEER** rating was developed in 1978 to more accurately gauge a unit's efficiency during a typical summer season. The **SEER** rating, then, differs from an EER rating in that it is an average calculated over time; SEER is a measurement of an AC unit's efficiency as it maintains a constant indoor temperature over the course of a cooling season with varying outdoor temperatures ranging from a low of 65°F to a high of 104°F with humidity levels ranging from 30% to 80%.

Just as with **SEER** ratings, a high **EER** rating indicates a more energy-efficient system and is a useful way to determine the efficiency of an AC unit when comparing across brands. However, the SEER number is a better indicator of an AC unit's overall operational cost as it takes into account how well the unit works under a variety of weather conditions over the course of typical year. Just remember to always compare one unit's EER to another's EER, and SEER number to SEER number when looking at multiple units.

SEER by the Numbers (13/14 SEER, 16 SEER, 18 SEER, 21 SEER)

A SEER 10 unit replaced with a SEER 13 unit results in a 30% energy savings. What if you wanted to go even higher? Below is an example of the potential energy savings and cost savings of replacing a SEER 10 unit with a higher SEER-rated unit.

Based on a 3-ton AC with a SEER 10 rating that consumes around \$1,323 in electricity per year:

- A SEER 18 unit will produce 44% in energy savings per year and consume around \$735 in electricity per year.
- A SEER 21 unit will produce 52% in energy saving per year and consume around \$630 in electricity per year.
- A SEER 25 unit will produce 60% in energy savings per year and consume around \$529 in electricity per year.



What does SEER have to do with MPG?

It's important to note that an AC unit's SEER rating represents the maximum efficiency of that particular unit. This means that an AC unit with a SEER 22 rating can reach an efficiency level as high as 22 but may not always operate at a 22. So, just like Miles Per Gallon (MPG), which is used to measure the gas efficiency of a car, the higher the MPG rating, the more miles per gallon you can get out of it; but only when it's being driven under ideal travel conditions (good weather, safe speeds, level ground, etc.). If, on the other hand, you drive your 36 MPG rated car like one of the characters from the *Fast and the Furious*, then your car's average MPG number will be much lower, perhaps in the 20s.

There are things you can do to help your AC unit run at its most efficient rating, such as maintaining a regular temperature in your home, keeping the air filters clean, and checking for leaks in the ductwork.

Why Having an Energy Efficient Air Conditioner Is Important

Created and regulated by the U.S. Department of Energy in 2008, the SEER rating helps consumers cut down on energy consumption and costs while providing better cooling for their home. It is required by law that all central air conditioning units be evaluated, rated, and assigned a SEER number by the manufacturer in accordance with efficiency tests stipulated by the U.S. Department of Energy.

According to the DOE's website, three-quarters of all homes in the U.S. have air conditioners which use close to 6% of all the electricity produced in the United States, costing homeowners \$29 billion annually. As a result, about 117 million metric tons of carbon dioxide are released into the air each year.

This is a serious concern because carbon dioxide (CO₂) is a greenhouse gas that traps heat within the Earth's atmosphere (for decades, if not centuries!) and contributes more to global warming and climate change than any other greenhouse gas. More and more extreme weather events are being linked to climate change, and the effects of climate change are far-reaching: from rising temperatures causing a shift in precipitation patterns that change the growing patterns of plants threatening wildlife dependent on this source of food, to rising sea levels eroding shorelines and destroying ecosystems, to farms and crops producing lower yields resulting in significant economic losses.

So, limiting CO₂ emissions is imperative for protecting the environment and minimizing climate change. Do your part to reduce your carbon footprint by minimizing the amount of energy you waste as much as possible. Switch to energy efficient light bulbs, walk or ride your bike instead of driving a car, take shorter showers, and install an energy-efficient air conditioning system with a high SEER rating.

FTC and the US Department of Energy

The mandatory upgrade from a SEER 12 to a SEER 13 that took place in 2006 represented a 30% increase in minimum energy efficiency for air conditioners. What does this mean in terms of reduced energy consumption? According to the DOE, 4.2 quadrillion BTUs will be saved between 2006 and 2030 by using a SEER 13 instead of SEER 12. This equates to the amount of annual energy used by 26 million U.S. households, resulting in savings to the consumer of over \$1 billion by 2020! Also, the SEER 13 standard has significantly reduced fossil fuel consumption and limited air pollution. Fewer power plants needed to be built due to a SEER 13 standard, which

means nitrous oxides emissions and greenhouse gas emissions were significantly reduces. As the minimum standard SEER rating increases, even more savings to the environment and consumers' wallets will occur.

In 2015, the DOE established new minimum efficiency ratings for three different portions of the U.S. – the North, the South, and the Southwest. For new central air conditioners manufactured and sold in the warmer, southern regions, the minimum SEER was raised to 14. For northern regions, the minimum remains a SEER 13. The standard SEER breakdown across the nation is as follows:

SEER 13 minimum: Alaska, Colorado, Connecticut, Idaho, Illinois, Indiana, Iowa, Kansas, Maine, Massachusetts, Michigan, Minnesota, Missouri, Montana, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, Washington, West Virginia, Wisconsin and Wyoming

SEER 14 minimum: Alabama, Arizona, Arkansas, California, Delaware, Florida, Georgia, Hawaii, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Nevada, New Mexico, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

It is not required that consumers immediately upgrade to a more efficient unit, rather the minimum rating only applies to new units being manufactured and sold in the U.S. after January 2015.

Also, the Federal Trade Commission's EnergyGuide label (the yellow "hang tag" attached to heating and cooling systems), will now display a range of numbers representing the lowest and highest SEER rating for split-system air conditioners, instead of a single rating.

History of SEER Ratings – We've Come a Long Way

Before 1980 —SEER 6 or less

1980 to 1985 —SEER 7 or less

1986 to 1991—SEER 8 or less

1992 to 2005 —SEER 10 – SEER 12

2006 to present —SEER 13 or higher

That's a lot of energy saved!

Higher SEER Rated Units, Are They Right for You?

Some SEER ratings go as high as 26. Typically, higher SEER units are the best option for those who live in a climate that is hot and humid for most of the year and cutting energy costs is a priority, or for those who are dedicated to helping the environment by reducing carbon emissions with energy efficient appliances. As technology continues to improve, there will no doubt be more efficient models for consumers to choose from.

In fact, according to the International Energy Conservation Code (IECC), which was adopted by the United States in 2009, a framework of upgrades has been laid out that will continue until 2030 requiring manufacturers and installers to use progressively more efficient units. These changes will drive down costs and reduce environmental damage, which benefits everyone.

Therefore, the minimum SEER value will continue to increase, with the next one likely to go into effect in 2023, where northern states must have a minimum of SEER 14 and southern states a minimum of SEER 15.

How to Find Your Current AC Unit's SEER Rating

To find out the SEER rating of your current split system unit, look for the yellow and black tag stuck to the side of the condenser. You will see the words "Seasonal Energy Efficiency Ratio" and the number underneath is the SEER number. If you can't find it there, look for a performance information sheet stuck to the front of the air handler on the indoor part of the unit. Most packaged units have the SEER rating listed on the black and yellow "hang tag" located on the outside of the unit. If you've looked everywhere and still can't find your SEER rating, then the Air Conditioning, Heating and Refrigeration Institute has a handy directory look up on their website, where you can put in the make and model of your AC system to find the SEER rating.

Now that you know your current system's SEER number, you can calculate how much more energy efficient your new air conditioner will be. Chances are, your old unit has a SEER rating that is no longer made or allowed to be made by law.

Types of AC

It's easy to take your air conditioner for granted. You likely never give it a moment's thought as it hums quietly in the background cooling your home to the perfect temperature on those sweltering hot days... until suddenly it doesn't. Next thing you know you're on the phone with an AC company who asks you what type of system you have, and all you know is it's an "air conditioner" - you have no idea what kind of unit it is. Well, if you're in the market for replacing your old air conditioner, then it's time to

educate yourself about an important component of your home that's integral to your comfort, well-being and wallet.

Now that you know about SEER and EER ratings and how they relate to an AC unit's efficiency, understanding the different types of air conditioning systems available will help you decide which option is the best one for your home.

Window Units: Also known as "room air conditioners," this type of system contains all the necessary AC components (compressor, condenser, evaporator, and cooling coil) into a single box that is placed either in a window or wall of a room. Blowing cool air directly into a room, this type of system is effective for cooling small spaces and homes. Window units only have an EER rating.

Central Air Conditioners: Distributing cooled air via a system of ducts, Central AC systems work best for larger homes and buildings. The two most common types of Central Air Conditioning systems are split or packaged units.

Split systems: A split system has an indoor component, which includes the evaporator coil and blower, and an outdoor component, which includes the condenser coils, condensing fan, and the compressor housed in a metal case. This type of system is economical because it shares the ductwork used by the heating system.

Packaged units: A packaged unit is usually located outdoors and combines the evaporator coil, condenser, and compressor into a single cabinet. Air is drawn from the inside through ducts in the wall or roof and returned, cooled, to the inside of the house. Packaged units also typically include heating coils eliminating the need for a separate indoor furnace.

Ductless Mini-Split Systems: Ideal for houses with no ductwork, the mini-split system uses tubing to combine the outside compressor and condenser to indoor air-handling units, which are typically mounted high on a room's interior wall and circulates the cooled air with a fan. Each room, however, will have its own air handler, much like a window unit, with the ability to cool a room to a temperature different from other surrounding rooms.

When determining the type of air conditioning system for your home, it's important you choose a system that's best fits the size of your home. A system that is too large or too small will not adequately cool or dehumidify your home. A good rule of thumb, though, is to stay consistent with what you already have and replace a split system with a split system and a packaged unit with a packaged unit, especially if you have been generally satisfied with the level of comfort your system provides.

New Air Conditioning Systems Can Save You Money

Air conditioners certainly have come a long way since the first system was developed by Willis Carrier in 1902. The device he created blew air across chilled pipes to lower the temperature and humidity levels. Today's air conditioning systems effectively and efficiently cool your home by using state-of-the-art equipment that uses a lot less energy than the models produced just a few years ago do.

In fact, there's a good number of energy-efficient AC models to choose from now, ranging from 13 SEER all the way to 26 SEER, with higher-rated models being manufactured every year. SEER stands for Seasonal Energy Efficiency Ratio and indicates the energy-efficiency of a particular air conditioning system. The higher the SEER rating, the more energy-efficient it is, which means increased savings on your utility bill over the life of the air conditioner. Although more expensive than base models, you can usually recoup the extra cost of purchasing a high SEER unit over several years by the lower monthly utility bills you'll receive. Most commonly, people gravitate toward the 14-18 SEER range when purchasing equipment for their home.

If your current air conditioner has been around awhile and showing signs of needing repair, such as not cooling your home like it should on hot, summer days, skyrocketing utility bills, or clanking, banging, or rattling sounds, then it's probably time to start shopping for a replacement. The good news is that depending on the SEER rating of your current system, newer SEER models can save you a lot of money on your energy bill! If your current air conditioner is pretty ancient, then it could be an 8 SEER. Replacing it with a 16 SEER unit would save you nearly 50% on energy costs and significantly reduce your utility bill.

Replacing an 8 SEER unit
with a 16 SEER

SAVES

...nearly **50% on energy costs**

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Common questions/FAQs about SEER

1. Are higher SEER units better made?

Base models, such as 13 SEER and 14 SEER systems, are made with the same quality equipment as higher SEER units. When you pay extra for a high SEER system, you're paying for increased efficiency only, not better quality.

2. **Will the minimum-required SEER rating continue to increase?**
As technology improves and manufacturers continue making higher SEER models, it's likely that every several years or so, the minimum SEER rating will increase. In fact, there is a proposal to increase the current 13 and 14 SEER minimum to 14 and 15 by 2023. Increasing the energy efficiency of all appliances is a move in the right direction for the environment and for consumers.
3. **How can I find out the minimum SEER rating for my state?**
You can check on the U.S. Department of Energy's website or refer to the portion of this e-doc titled "FTC and the US Department of Energy".
4. **Are there rebate incentives for higher SEER units?**
Yes, higher SEER units typically come with incentives and/or rebates offered by federal, state, and local governments. Many utility companies offer rebates as well.
5. **Do I have to upgrade my unit to the minimum SEER now?**
No, if your older model is still working fine, then you do not need to replace it. However, it's important to note that your old unit is likely going to cost you more to operate than a newer, more energy-efficient model would.
6. **What is a good SEER rating?**
14 and 16 SEER are good ratings for most people. Of course, everybody is different and certain factors such as personal lifestyle choices, concern for the environment, budget, and local climate should be considered. You can find 14 and 16 SEER systems that are well-made, energy efficient units that are both good for the environment and good for your wallet.

Other Questions to Ask Before Purchasing Your New Air Conditioning System

Now that you've determined you're upgrading your current air conditioning system with a more energy-efficient one, and you've educated yourself about the different types of central air conditioning systems, there are some important questions you should ask your contractor before your new unit is installed, such as:

1. What size system do I need to adequately cool my home? Don't assume the size of the old system is the right size as it may not have been measured properly.
2. Will the current ductwork suffice? What is the condition of the current ductwork; should the ductwork be cleaned before the new unit is installed?
3. Are there any rebates, tax credits, or savings incentives for purchasing an energy-efficient system?
4. What kind of regular maintenance is required? Do you offer a maintenance program?
5. What type of warranty is there and what does it cover?

With a little bit of AC knowledge and asking the right questions, you will be able to make the best choice in air conditioning systems for your home.

Getting Another Bid

Now that you have a better understanding of how the SEER rating can affect your energy savings and reduce your monthly utility bill, it's important to shop around to find the lowest-priced air conditioning system with your ideal SEER number. Don't accept the first bid you come across – get another one, and another one still from a variety of AC retailers, including online retailers. You will be shocked at just how much money you can save by cutting out the “middle man” and ordering your new AC unit online. Check out these lowest-guaranteed prices at Pricefixer.com!