

# GETTING YOUR HOME READY FOR SOLAR



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# UNDERSTANDING YOUR HOME'S ENERGY EFFICIENCY

BEFORE YOU CAN TRULY UNDERSTAND HOW TO OFFSET YOUR HOME'S ENERGY, YOU NEED TO UNDERSTAND THE ENERGY THAT YOUR HOME USES AND HOW YOU CAN TAKE SMALL STEPS TO INCREASE YOUR EFFICIENCY AND SAVE MONEY.

## How to do this:

### Get a "home energy audit" or "home energy assessment"

A home energy assessments or audits can help you understand the whole picture of your home's energy use, comfort, and safety.

#### Why?

An assessment can help you identify where your home is inefficient, how much energy your home is using, and any problem areas such as leaks you should prioritize to increase efficiency and save money on your energy bills.

**DID YOU KNOW?**

**SOME PROGRAMS OFFER DISCOUNTED ENERGY AUDITS AND/OR INCENTIVES FOR GETTING AN ENERGY AUDIT. SEE THE DSIRE WEBSITE FOR INCENTIVES IN YOUR AREA.**

### Professional Home Energy Assessment

A professional home energy assessment provides a thorough analysis of your home's energy use. They typically consist of a room-by-room examination of the home, and in some cases, your assessor may use equipment such as blower doors, infrared cameras, gas leak and carbon monoxide detectors, moisture meters, and non-toxic smoke pens to evaluate the efficiency of your home. Learn more about professional home energy assessments [here](#).

### DIY Assessment

While a professional energy assessment provides the most holistic picture of your home's energy use. A self-assessment can also help you pinpoint problem areas and prioritize your energy efficiency upgrades. A self-assessment may include inspecting drafty areas for leaks, looking at attic insulation for leaks around your heating and cooling equipment, or checking the efficiency rating on your appliances. Learn more about DIY energy assessments [here](#).

# WAYS TO REDUCE YOUR ENERGY USAGE

LOWERING THE ENERGY USAGE IN YOUR HOME WILL LOWER THE AMOUNT OF ENERGY YOU NEED TO OFFSET IN SOLAR POWER.



1

## CHANGING OUT LIGHT BULBS

Lighting accounts for an average of 15% of an average home's energy usage. LED light bulbs use 90% less energy than incandescent light bulbs annually.



2

## UPDATE YOUR HVAC SYSTEMS

Upgrading your heating, ventilation, and air conditioning systems can save energy and money. HVAC systems can account for up to 40% of your energy bill. ENERGY STAR certified homes save up to 10% annually on utility bills.



3

## PROPER INSULATION

Make sure there are no gaps in any of your windows or doors. Check your foundation for any cracks that might be letting any air in or out. Fixing gaps can reduce your heating and cooling costs by up to 25%.



4

## HANG UP YOUR CLOTHES TO AIR DRY

You can save over \$100 per year in energy savings by air drying your clothes.



# ELECTRIFYING YOUR HOME



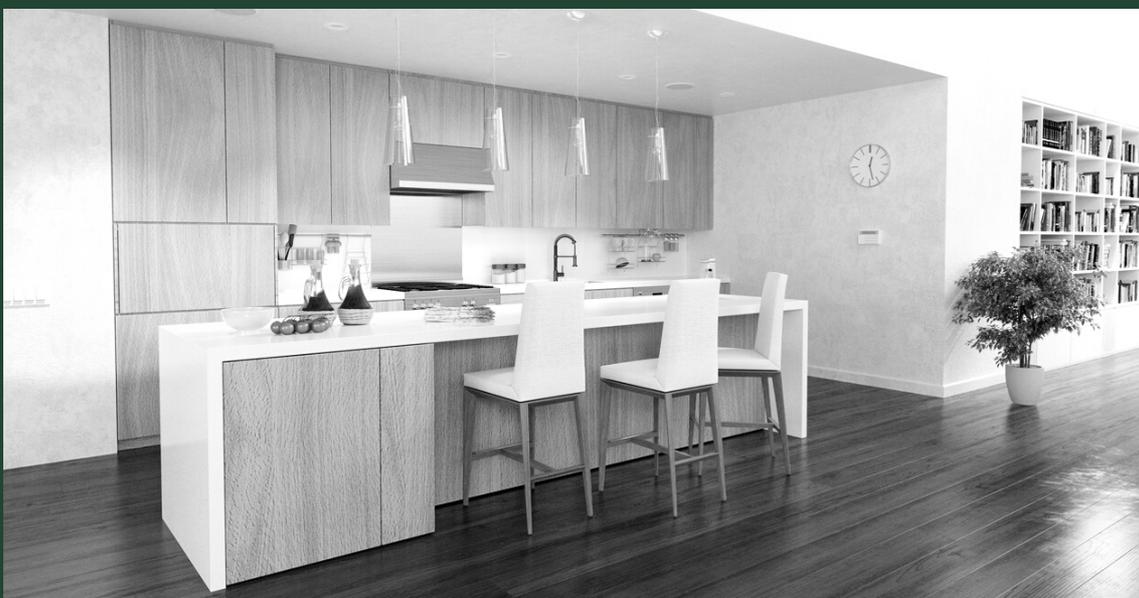
Around 40% of the United States carbon emissions come from our homes and the vehicles we drive.

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We can help **reduce emissions** and **save money** by electrifying our homes and powering them with renewable energy such as solar or wind.

Before you get a solar PV system in your home, it's beneficial to electrify your home for a number of reasons.

- Electrifying your home BEFORE you get solar will help ensure that you get the system that is right for your energy needs.
- The more energy that runs off your solar system, the more money you will save – lower gas bill
- Better for the environment – the more you can use energy from the sun, the better



# WHAT CAN YOU ELECTRIFY?

## HVAC

### Air Source Heat Pump

An air-source heat pump can provide efficient heating and cooling for your home, delivering up to three times more heat energy to a home than the electrical energy it consumes. This is possible because a heat pump transfers heat rather than converting it from a fuel like combustion heating systems.

### Average annual Carbon Reduction:

- Switching from baseboards to a heat pump: 7.6 Ton
- Switching from an electric furnace to a heat pump: 5.1 Ton
- Switching from a natural gas furnace to a heat pump: 1.1 Ton



(For reference going vegan will cut your carbon footprint by 1 ton per year.)

Considering that the average heating system lasts 15-30 years, investing in a heat pump is a way to guarantee anywhere from 15 to 228 tons of emissions reductions.

Source: Carbon Switch

**DID YOU KNOW?**

Heat pumps DO work in cold weather climates. It's a common misconception that heat pumps only work in mild climates. In all actuality high-performance heat pumps can warm a home when outdoor temps were down too negative 31 degrees F. Even in sub-zero temperatures high-end units can be over 100 percent efficient.

### Ground Source Heat Pump (Commonly known as Geothermal)

A ground source heat pump system can provide space heating and cooling, and, in some cases, hot water for your home. The technology uses an indoor heat pump unit and a heat exchanging ground loop buried underground (or underwater) to transfer thermal energy between and amongst the ground and your home.

**DID YOU KNOW?**

Fun fact: Geothermal energy produces 0.03% of the emissions that coal produces and .05% of the emissions that natural gas produces.

### Heat Pump Water Heater (also known as hybrid hot water heaters)

Heat pump hot water heaters pull heat from the surrounding air to heat the water instead of generating heat from electricity or gas. They can be two to three times more energy-efficient than conventional electric water heaters and are considered the most energy-efficient water heaters on the market. Many homeowners can save \$200 to \$600 per year by switching to a heat pump water heater.

While the upfront cost may be higher there are lots of rebates and incentives to purchase a heat pump including a federal incentive as well as state and utility incentives.

**DID YOU KNOW?**

Installing a hot water heat pump is the equivalent of 7 solar panels! If you factor out that cost, it practically pays for itself.

# WHAT CAN YOU ELECTRIFY?

## Cooking

### Induction Range

An induction cooktop is a type of electric cooktop that uses magnetic coils to heat your cookware directly, resulting in a more energy efficient and healthier way to cook.

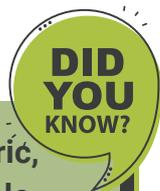
Benefits of an induction cooktop:

- Food cooks more quickly (They can boil water 25-50% faster than electric or gas stoves)
- Gives you a high degree of control when cooking
- Safer and easier to clean as the stovetop itself doesn't heat up
- More energy efficient
- It can cut off the power supply automatically if it does not detect any cookware or empty cookware
- Avoid the irritating and potentially toxic gases that can accumulate indoors when using gas stoves

### How does it work?

While gas or electric stoves cook through conduction, using flames or coils to heat the pan, induction stoves use electromagnetism to heat the cookware itself. When you turn on an induction burner, an alternating electric current darts through a copper coil creating a magnetic field, exciting the elements within the pots and pans themselves. It can recognize the metal's temperature and adjust heat accordingly.

If induction cooking isn't an option for you, consider an efficient electric stove over a gas stove which emits potent greenhouse gases.



**Induction stoves are fully electric, so when paired with a renewable power source, they allow you to cook emissions-free.**

An electric range can be less expensive upfront and will allow you to continue to use your current pots and pan, whereas an induction stove may require you to retire or replace some pieces.

### INDUCTION COOKING

- **84% efficient**
- **Usually requires special cookware**
- **Heats up quickly**
- **Safe for kids and adults**
- **No harmful emissions**



### RADIANT (ELECTRIC) COOKING

- **74% efficient**
- **Tend to last a long time**
- **Can use any pans**
- **No harmful emissions**
- **Burners heat up and can be a safety issue**



### GAS COOKING

- **40% efficient**
- **Hard to clean**
- **Dangerous emissions**



### Electric Grill

An electric grill is an outdoor grill that cooks similarly to a charcoal or gas grill but uses electricity. There are many benefits to using an electric grill including:

- Ease of use
- More compact, they work well in smaller back yards and they are easier to travel with
- Since there is no open flame or pollutants, they are safer to use

Why switch from your gas or charcoal grill? One hour of using a natural gas grill can release 5.6 pounds of carbon dioxide; that figure rises to 11 pounds for charcoal.

# CONSIDERATIONS FOR YOUR ROOF

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Your roof is the foundation for your solar panels, so it is important to consider all of these factors while looking into solar.



## IS YOUR ROOF BIG ENOUGH?

Systems installed on a single, large roof surface are easier and cheaper to install. If that's the case for you, your system can be broken into separate sub-arrays on multiple roof surfaces.

## WHAT DIRECTION IS YOUR ROOF ORIENTED?

North facing roofs are not ideal due to limited sun exposure. Roofs that face east, south, or west work best for solar.



## HOW MUCH SUN EXPOSURE DOES YOUR ROOF GET?

The more sun exposure your roof has, the better your solar panels will do! Trees, chimneys, swamp coolers, and other buildings may shade your roof and will affect its solar potential. You don't have to have 100% sun exposure on your roof for a viable system.

## HOW IS YOUR ROOF ANGLED?

The angle of your roof affects the amount of solar production and how the panels can be mounted. A roof steeper than 45 degrees is too steep for installation and cuts down the amount of solar production possible.

## HOW OLD IS YOUR ROOF?

If your roof needs to be replaced within the next 1-3 years, you should consider waiting to install. Your roof does not need to be brand new to go solar, but it needs to be in good condition without leaks or visible damage.

## WHAT IS YOUR ROOF MADE OF?

The different types of roof material will be a factor in determining the price of installation.



# BATTERY STORAGE

## CONSIDERING BATTERY STORAGE WITH YOUR SOLAR PANELS?



### WHAT ABOUT BATTERIES?

Battery energy storage systems are considerably more advanced than the batteries you keep in your kitchen drawer or insert in your children's toys. A battery storage system can be charged by electricity generated from renewable energy, like wind and solar power. Intelligent battery software uses algorithms to coordinate energy production and computerized control systems are used to decide when to keep the energy to provide reserves or release it to the grid. Energy is released from the battery storage system during times of peak demand, keeping costs down and electricity flowing.

### ADVANTAGES OF BATTERY STORAGE

- Save on your electricity costs by using energy you create rather than from the grid
- Your excess power is stored in the battery system so on cloudy days or days when your system doesn't produce as much power as usual, you can pull from the batteries instead of the grid
- Solar battery systems allow your home to be more resilient when it comes to energy
- Installing solar batteries allows you to reduce your home's carbon footprint and bring it closer to self-sufficiency.

Upgrading your home energy system can be costly upfront but overtime your Solar PV System and green home improvements will pay for themselves.

Clean Energy Credit Union's vision is a world where everyone can participate in the clean energy movement and we do this by offering low rates for a variety of clean energy and energy saving projects.

# FINANCING YOUR CLEAN ENERGY PRODUCTS

Here are some examples of the types of clean energy loans we offer to help you save money on your energy bills and reduce your carbon footprint:

## SOLAR PV LOAN

By offering up to 100% financing with no money down, our solar loans allow you to swap your monthly electric bill for a monthly loan payment on a solar electric system—which you'll own at the end of the loan repayment period. We provide multiple loan types and flexible rates to fit your needs, apply directly with us or through one of our solar installation partners.

## GEOHERMAL LOAN

With our geothermal system loans, you can get a highly efficient heating and cooling system for no money down. We offer various loan types and terms to help you offset your monthly electric bill for a monthly loan payment on a geothermal system instead.

## GREEN HOME IMPROVEMENT LOAN

By offering up to 100% financing with no money down, our solar loans allow you to swap your monthly electric bill for a monthly loan payment on a solar electric system—which you'll own at the end of the loan repayment period. We provide multiple loan types and flexible rates to fit your needs, apply directly with us or through one of our solar installation partners.

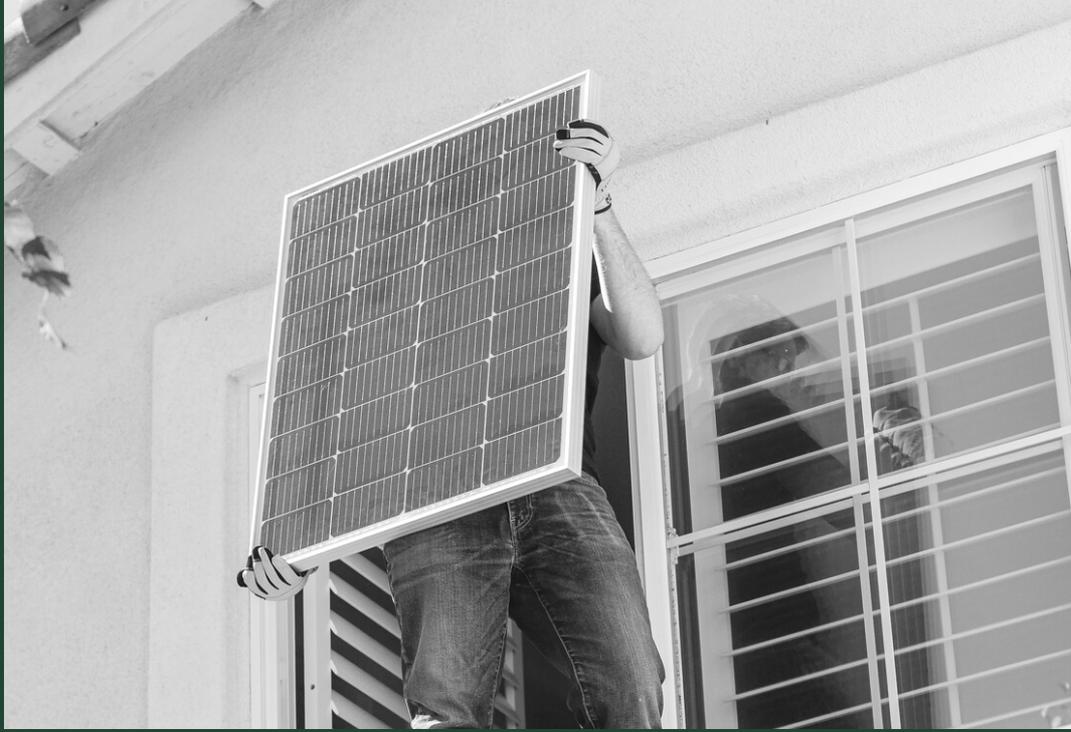
## ELECTRIC VEHICLES

You can help lead the way to a cleaner tomorrow by driving an electric vehicle that increases fuel efficiency, reduces harmful emissions, and cuts your fuel costs. We offer unbeatable rates to get you into your new EV quickly and affordably. Buyers can take advantage of our rates and flexible terms for both new and used electric and hybrid plug in cars, motorcycles, and trucks.

Check out our [Green Home Improvement Page](#) to apply today.



# SOLAR CHECKLIST



## Energy Audit

You understand your home's energy efficiency.

## Energy Reduction

You've taken steps to reduce your home's energy usage.

## Electrification

You've gone electric where you can so you can get the most out of your solar PV system.

## Roof

You've evaluated your roof and taken steps to increase exposure if necessary.

## Batteries

You've decided if battery storage is right for you.

## Financing

You've looked into how you will finance your updates and solar PV system.



## *Financing the Clean Energy Movement*

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### **WE ARE HERE TO HELP**

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