How does ETS heating work?

Electric Thermal Storage (ETS) is an electric home heating device that can help decrease your heating costs by storing heat when electricity costs are lower, and then releasing the heat throughout the day.

ETS heaters are 100% efficient units designed to provide low-cost heat, 24 hours a day. By using electricity during LPEA's Time-of-Use Program Off-Peak hours (those times during the day and night when usage is lower and electricity is cheaper), ETS units provide heat at lower costs than most other energy sources.

During off-peak hours, the ETS unit's heating elements convert electricity to heat which is stored in high-density ceramic bricks. The bricks are surrounded by high-efficiency insulation which allows them to hold great amounts of heat for long periods of time. A fan evenly and quietly distributes the heat to your home during higher cost, on-peak hours and built-in thermostats allow you to easily maintain a desired temperature.

The system typically consists of two components: the ETS Heating unit and the Power Line Carrier (PLC) Transceiver or a Time-Clock. The PLC Transceiver controls the charge time and level of the ETS Heater automatically and is typically found near the LPEA electrical meter. The Time-Clock is an alternate method for controlling the ETS Heater unit and can be found inside the unit itself.

LPEA
La Plata Electric Association, Inc.
A Touchstone Energy® Cooperative

What is LPEA's Time-of-Use program?

Residential Rate Comparison: Standard vs Time of Use

Standard

Energy Rate = 12.56¢ per kWh

Off-Peak
12 a.m.–4 p.m.

Hours to Watch
4 p.m.–9 p.m.
one hour a month when
energy usage is highest =
$1.50 per kW used during
that one hour *only*

Off-Peak
9 p.m.–12 a.m.

Time of Use

Off-Peak
12 a.m.–6 a.m.
6.2¢ per kWh

On-Peak
6 a.m.–9 a.m.
25.61¢ per kWh

Off-Peak
9 a.m.–5 p.m.
6.2¢ per kWh

On-Peak
5 p.m.–10 p.m.
25.61¢ per kWh

Off-Peak
10 p.m.–
12 a.m.
6.2¢ per
kWh

12a 1a 2a 3a 4a 5a 6a 7a 8a 9a 10a 11a 12p 1p 2p 3p 4p 5p 6p 7p 8p 9p 10p 11p 12a
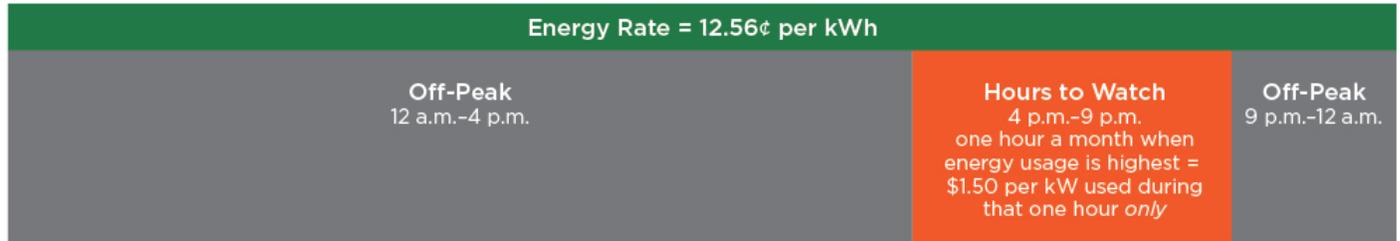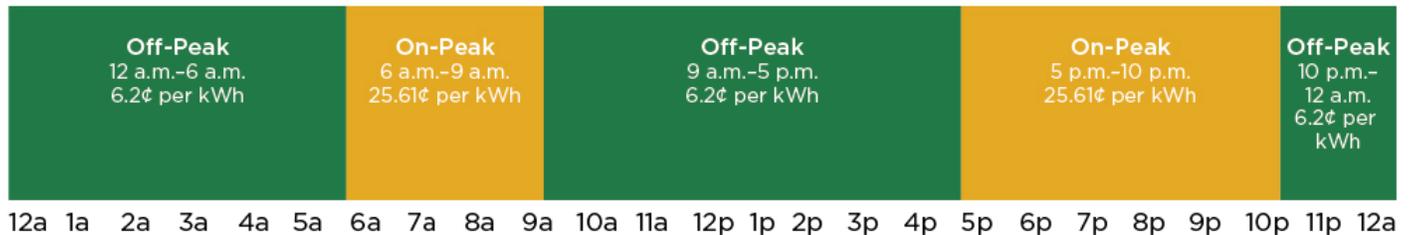
For more information: lpea.coop/rates

Electricity is like a freeway. The more people use it, the bigger the infrastructure needs to be to support it. And a bigger infrastructure means bigger costs.

LPEA members can save money by spreading out our collective power use and decreasing periods of peak demand. To decrease this peak demand, LPEA's optional Time-of-Use rate charges members different rates for their power based on the time of use. Higher rates are charged during the "On-Peak" hours and lower rates are charged at all other times.

Residential Time-of-Use Program Off-Peak Periods (Lower cost)
- 9 AM – 5 PM
- 10 PM – 6 AM
- Monday – Saturday
- All Day Sunday
- Thanksgiving and Christmas

Residential Time-of-Use Program On-Peak Periods (Increased cost)
- 6 AM – 9 AM
- 5 PM – 10 PM
- Monday – Saturday

Basic Operation

For the system to function correctly, both the ETS unit and the PLC Transceiver need to be powered. The PLC Transceiver will often be wired to a different circuit than the ETS heater and is often found near the electrical meter on the exterior of the building. The internal Time-Clock, found inside each ETS unit, is a second option for controlling ETS units in place of a PLC Transceiver.

The three or four digit LED display found on each ETS unit shows specific operating information. In standard operation, these digits continuously display current room temperature and one of the following brick core operating modes:

C = Charge period or off-peak time.
P = Peak period or on-peak time.

Note that 'P' and 'C' modes do not follow the Time-of-Use peak periods exactly, some lag has been purposely built into the schedule. Units will enter 'P' and 'C' mode on Sunday as well. This does not affect your billing and is simply the result of the built-in scheduling.

(M) Mode (EDIT) Button – Activates the editing menu for changing the operating information of the heater.

Up and Down Arrow Buttons – Increase or decrease room temperature set point. Also used to scroll up or down when viewing or changing the heater's operating functions.

The room temperature set point is adjusted by pressing the up arrow to increase, or the down arrow to decrease, the set point. When the heater senses a heat call, the variable speed blower is energized and circulates room air through the brick core. This air heated and discharged into the room to maintain the desired temperature. To keep the room temperature constant, the blower automatically adjusts to the appropriate speed and may continue to operate after the set point has been reached.

With automatic charge control, the brick core charge level is regulated automatically in relation to outdoor temperature and the heating requirements. The outdoor sensor or PLC system monitors outdoor temperature and provides this information to the heater. The heater responds by storing heat in the brick core accordingly. No user interface is required to adjust the brick core charge level.

ROOM UNIT

The Room Unit (2100 Series) is ideal for any room in your home. It can be used as a supplement to another heating system or a direct replacement of electric baseboards or wood stoves.

COMFORT PLUS FORCED AIR FURNACE

The Comfort Plus Forced Air Furnace (4100 Series) can heat your entire home through a central duct system. The system can be interfaced with a heat pump for even greater efficiency.

COMFORT PLUS HYDRONIC FURNACE

The Comfort Plus Hydronic Furnace (5100 Series) will heat your entire home through in-floor, hydronic baseboard and/or forced air. The furnace can be equipped with a heat pump system for even greater efficiency.

Getting the most out of your ETS Heating

Your ETS system will automatically control most functions including charge time and amount of charge. To further reduce operating costs of your ETS system, you can control the room temperature setpoint. The setpoint can be decreased on the unit by pressing the down arrow. This can be done any time the room does not need to be heated to higher temperatures, like at night or when you leave the house for longer periods of time.

Ensuring that the heat produced by the ETS unit is moved around the space is important as well. A ceiling fan operating in up-draft mode can help to circulate air around a space ensuring more even heating and higher efficiency. Conversely, rooms that are not being used, and do not need to be heated to the same temperature as the rest of the space, can be isolated by closing the door, limiting the amount of heat that goes into that room.

If your system includes a PLC Connect you can also use the Steffes online web app to schedule temperature setbacks for different days and times, further reducing heating costs. This same app allows you to turn the temperature down remotely if you are away from home.

Our Energy Management Advisors are available to discuss additional ways that you can reduce your energy costs and can be reached by calling LPEA at (970) 247-5786.

Basic Checks and Troubleshooting

If your ETS heating system is not working correctly, there are several steps that can be taken to correct the issue. Beyond these steps, it is advised that users contact a licensed electrician. A list of electricians with experience working on Steffes systems can be found on the LPEA website. First, verify that both your ETS units and PLC Transceiver (typically found near the LPEA meter) are powered on. These components are often on separate circuits, so ensure that both circuits are powered.

Sometimes turning the ETS heating units and PLC Transceiver off, then back on again to reboot, can help to fix an issue.

If the ETS heater unit displays anything other than 'P' or 'C' and the current temperature, the display is likely showing an error code. An electrician, Steffes technician, or LPEA Energy Management Advisor may be able to use these codes to determine what the issue is and suggest a solution.

A list of electricians experienced with Steffes systems can be found on the LPEA website.

Steffes tech support can help to troubleshoot problems over the phone. Contact info for Steffes can be found at www.steffes.com/contact-us/

An LPEA Energy Management Advisor can also help. Call LPEA at (970) 247-5786 to get in contact with our team.

How to Add a PLC Connect to Your Home Wi-Fi

Step 1: Create an account on Steffes Connect
1. Open a web browser on a smartphone, tablet, or computer, and navigate to the Steffes Connect website at www.steffesconnect.com.
2. Click on Create Account.

3. Input name, email address, and desired password. Review the Terms of Service and check box. Click Register.
4. Follow the instructions on the verification email sent to the email you used to register your new account within 24 hours to activate the new Steffes Connect account.

Step 2: Register your device on the web app
1. Input device location (home, cabin, garage...), address, and Power Provider. Once the Power Provider is selected, a rate schedule is available. Select the rate schedule and click Submit.
   ○ LPEA Members can pick from Group A, B, or C; the scheduling is similar across all groups.
2. On the Link Device page, input room name, MAC address, and verification code (found inside the PLC or on the included postcard). The verification code is case sensitive. Click Submit.

   NOTE: If an error message is displayed stating that the device is registered to another user please contact LPEA at (970) 247-5786.

Step 3: Connect your device to a wifi network
Wireless internet (Wi-Fi) or an Ethernet cable can be used for network connection. If using an Ethernet connection, a cable must be installed between the transceiver and the router. No addition set-up is required. If using Wi-Fi, complete Network Connection steps as follows:

1. Access available Wi-Fi connections on a smartphone, tablet, or computer. This can often be found in the lower right corner on a Windows computer or through your Network and Connections settings. "Steffes XCVR" with a MAC address should appear under available networks. This may take up to 5 minutes to appear. Click on the Steffes XCVR Wi-Fi network to temporarily connect to the PLC Connect.
2. Enter the verification code located on the postcard included with the transceiver or

located inside the PLC. The device should automatically direct you to enter the verification code. If not automatically redirected, open a web browser and navigate to setup.steffes.com.
3. When prompted, select your personal internet network. Enter your network password, if protected. Make sure "Auto Reconnect" is selected when using wireless connection. Click Save.
4. The status page will appear. Click Connect Device on the bottom right of the screen
5. Reconnect your computer, tablet, or phone to your home Wi-Fi network.
6. Open a web browser on a smartphone, tablet, or computer, and navigate back to steffesconnect.com.
7. The transceiver should show up on the home page with a check mark inside a green circle. This shows the transceiver is connected to the internet.

Default Email Notifications
NOTE: The Steffes Connect web app defaults to sending email alerts for temperature thresholds. To turn off all alerts, select your device and click on the blue pencil icon in the top right corner of the page. Under the 'Notifications Settings' section, turn "Custom" to ON. Deselect all boxes to turn off those notifications.

For more information contact LPEA at (970) 247-5786 or visit our website at lpea.coop.