



## 1. What's the magic behind heat pumps?

Everything starts with the sunrise. The sun heats our atmosphere and the outer layer of the earth's crust. In a year the energy sent to the earth by the sun is 50 times the energy consumed on our planet. it should be more. For this reason, the sun is an unlimited and inexhaustible source of energy. On sunny days you feel the thermal energy of the sun in your body. Actually, including cold winter days and nights There is always enough thermal energy in the air, especially. This situation is only for Florida or the south. Not for Spain, such as Sweden or Norway, where there are thousands of homes already using heat pumps. It also applies to countries.



## 2. Why Do Heat Pumps Cause Lower CO2 Emissions?

The amount of emissions taken by heat pumps is much higher compared to conventional heating systems. is low. CO2 emissions are also low as heat pumps consume very little energy, limited only by the electricity required by the compressor.





### 3. How Do Heat Pumps Work?

Despite all these advantages, heat pumps remain a mystery to many people. From a cold source The concept of "heat" transfer to a cold indoor environment may not make sense to everyone at first sight. However, the heat pumps don't have a magic. For a heat pump only outdoor air, two heat exchangers (one to absorb heat, the other to absorb heat relatively low amount of electricity to transfer the system to space) and to keep the system running energy is required.

The heat pump provides energy from the environment. The heat pump receives energy at a certain temperature, this temperature raises it and then transfers it to a fluid. In the heat pump system, this fluid is low temperature it is the water that circulates in radiators, underfloor heating systems or fan coil units.

### 4. What Is Refrigerant And What Is It For?

Refrigerant is a special liquid that evaporates at a temperature lower than the outside temperature. The refrigerant meets the outside air in copper pipes and absorbs the thermal energy from the air. This is the first heat exchange in the system. At this stage, the fluid evaporates with the heat energy absorbed from the outside air.

When you wet your finger and blow air into the wet spot, the wet surface of your finger you can feel it cooling.

### 5. Compressor - The heart of the heat pump

The refrigerant passes through the evaporator and takes the heat from the air, then goes into the gas phase. This After step the compressor is activated. When you compress a gas, the heat energy in the gas phase is together it becomes concentrated and eventually the temperature rises. When inflating the wheel of your bike, the wheel you feel the air inside is getting warmer.

The temperature in the heat pump's compressor is much higher compared to the initial temperature of the source (outdoor air).

increases substantially. The compressed gas enters the condenser, a surface colder than the gas itself.

When it enters, the second heat exchange occurs in the heated environment. Finally the gas will condense and heat your home The heat is released.

The condensation process is the transformation of the gas back into a liquid state. Refrigerant through an expansion valve passes, reaches its initial pressure and the whole process starts over.



## ADVANTAGES

### **Lower energy consumption, pleasant warmth in your home**

The heat pump is 5 times more efficient than a conventional heating system based on fossil fuels or electricity works. Using the heat in the outside air, it consumes less energy and allows you to experience comfort without interruption you continue. In addition, since the maintenance requirement is very low, the operating cost is minimal is level.

With the inverter compressor technology, your energy savings will be much higher.

### **Very low assembly cost**

The heat pump takes heat from the air. There is no need to dig or drill any place. Both outside Both the unit and the indoor unit have a compact design. Outdoor unit outside the building, on the roof It can be placed anywhere. Chimney in the room where the indoor unit is located, since it operates without smoke and or constant ventilation is not required.

### **Flexible application option**

The heat pump can be used for both new and restoration applications and is suitable for standard radiators, It can be connected to floor heating systems or fan coil units. To an existing heating system you do not need to replace this system completely.

### **Seamless comfort for your family**

In addition to meeting your heating needs, the heat pump provides your home with domestic hot water. Also, It creates comfortable environments for you and your family by cooling for hot summer days.

### **It is completely safe**

The heat pump does not use diesel, gas or other dangerous substances, so risks are also avoided. In addition, no gas connection or fuel tank is required. there is no. There is no risk of poisoning, odor or contamination due to tank leakage.



## AIR - WATER SOURCE HEAT PUMP

Economic - Ecological - Comfortable



- They are extremely compact and easy-to-use systems that use hidden energy besides the energy existing in the air.
- The air source heat pump can also be used in pool water heating. Heat Pumps Scandinavian It was designed in accordance with northern climate conditions. High even in the coldest weather conditions provides performance and energy efficiency.
- It can be integrated into an existing heating system. No burning, explosion, no risk of poisoning It is the most reliable system in the world.
- 83% according to diesel,  
80% according to LPG,  
70% according to Lng,  
58% compared to natural gas,  
65% compared to coal,... is much more economical.



**CANOVATE®**  
ENERJİ SİSTEMLERİ

## BRIEF INFORMATION ABOUT HEAT PUMP

Heat Pumps are included in the Renewable Energy classification under the title of Geothermal Energy. For more than 70 years, in many parts of the world, especially in Northern European Countries is used.

Heat Pumps basically do not generate energy, they work on the principle of carrying the available energy. Soil, Water and By changing the heat in the air to form a very little electrical energy, a compressor compressing through it converts into hot water. Domestic hot water through automation systems, It achieves heating and cooling. It does not use any other fuel, 4 units of energy with 1 unit of electrical energy obtains.

It is available in 5 units. For 10kwa energy generation the required expenditure is 2-2.5 kwa. By grouping multiple heat pumps with the cascade system, tens of thousands of square meters from a building of 80-100 m2 system can be installed up to buildings. Used urbanly with the central system in Northern Europe There are also examples.

The area of use is heating & cooling, more precisely, air conditioning and needing hot tap water. buildings of all kinds. Since it does not use any other fuel, it is very small except for a small boiler room system. areas, fire, chimney, fire, smoke, environmental pollution etc. It does not cause such results.

It is completely renewable, clean energy.

## HEATING WITH ONE DEVICE - HOT WATER AND COOLING

With CANOVATE HEAT PUMPS, you can use the energy stored in the outside air to heat your home and you can cool it. It is also possible to produce hot water by adding a boiler to the system.

The device is made from an outdoor weatherproof, quiet and light outdoor unit and a space-saving indoor unit.

It consists of a unit. It is economical and quiet thanks to its DC-Inverter compressor. DC-Inverter compressor operates proportionally according to the power requirement and keeps the desired temperature constant. ThisIn this way, frequent activation and deactivation of the device is prevented and an economical operation is achieved.

Indoor unit Smart the control panel is not only for economical operation but also for high comfort. is a requirement.

Thanks to the control panel, a very easy-to-use menu and a graphically supported control panel are integrated into the device. has been. The importance of alternative energy sources due to environmental awareness and limited energy resources more and more.

Very little electrical energy of energy stored in soil, water or air by heat pumps With its help, it is used for heating purposes.



**CANOVATE®**  
ENERJİ SİSTEMLERİ

**HEAT PUMP Systems have been used in the world for about 50 years, America and because of energy saving in Europe, supported by the state, It is a system that has over millions of uses.**

**In Turkey began to use recently.**

**Sweden, Norway, Denmark, Netherlands, Austria, Germany, Canada, It is widely used in cold climates such as America.**

**In 2009, 50000 devices were installed in Germany.**

**60000 heat pump transformations are planned for 2010.**

**In Germany, 20 € state support is provided for each m2.**

**There is no incentive for Turkey and KDV rate is still 18%. In other words, almost one fifth of the devices you buy goes to the state as a tax.**

**France does not tax homes and businesses with heat pumps for 10 years.**

**The system is spreading rapidly with incentives in many European countries.**

**The use of natural gas is decreasing day by day in the Netherlands.**

**Many settlements in Sweden do not even have natural gas lines.**

**Almost all of the country is heated by heat pump devices.**



## Our Natural Heat Source



## Main Board in Energy

Energy is not created, it can only be converted from one form to another.

In the system where the energy changes form, the amount of energy consumed and produced is always equal.

Heat cannot be converted from a cold form to a hot form without consuming energy in any process.

Heat flow is always unidirectional. relatively, it flows from hot environment to cold environment.

Heat pumps in general terms; it aims to transport heat instead of producing it.

How does a heat pump work?

For this process, three units of free energy obtained from the soil by using one unit of electrical energy are presented to the building as four units.

## How does a heat pump work?

