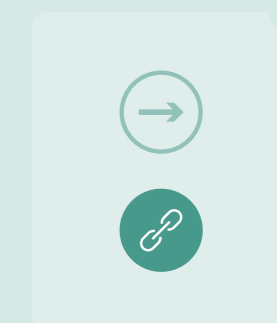
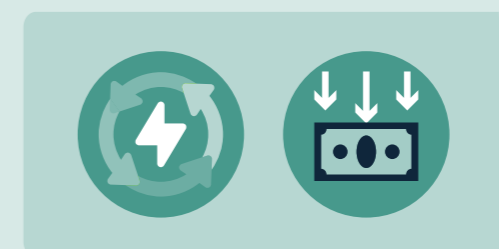
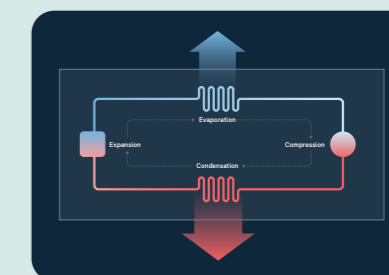
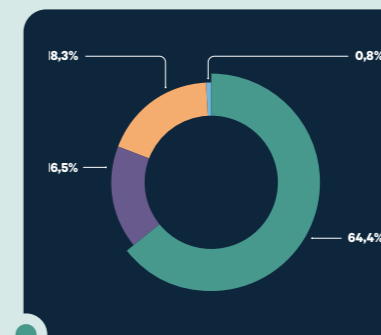




Home Heating Technology *Guide*

A comprehensive
overview of home heating
technology solutions

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Introduction

In Moldova, the residential sector accounts for more than 40% of the country's total energy consumption. To meet their heating needs, most households rely on bioenergy-fuelled stoves or natural gas boilers, particularly in regions without access to district heating infrastructure. Only seven Moldovan cities, including Chişinău, have access to district heating systems.

Despite their widespread usage, solid fuel stoves and gas boilers often fall short in terms of energy efficiency and sustainability compared with other options available on the market.

More efficient and sustainable alternatives – such as heat pumps powered by low-emissions electricity – therefore deserve a closer look.

This guide offers a comparison of home heating options, supporting consumers in Moldova as they make decisions based on their personal energy needs and circumstances. Contractors can offer more customised advice and cost estimates.



40%

The building sector accounts for more than 40% of the country's total energy consumption

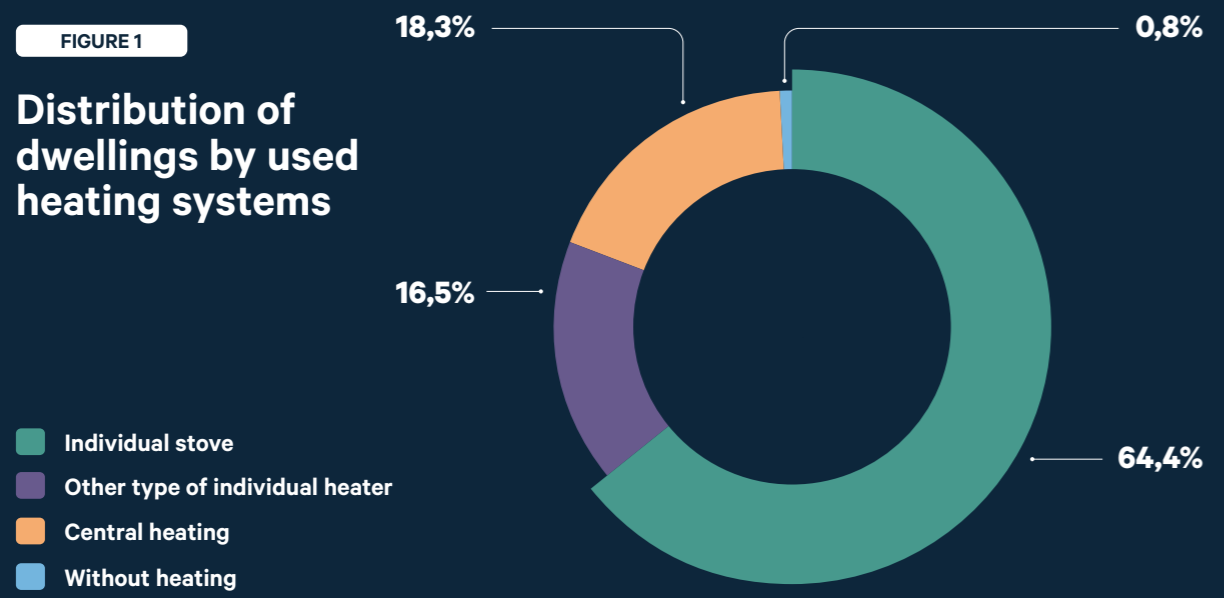


Certain heat pumps models can both heat homes and cool them



FIGURE 1

Distribution of dwellings by used heating systems

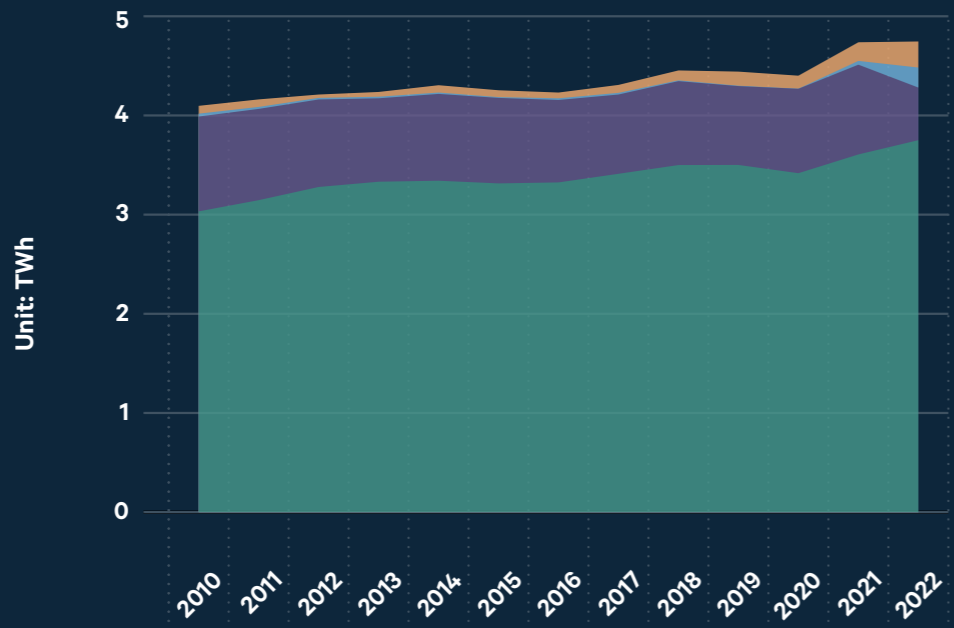


- Individual stove
- Other type of individual heater
- Central heating
- Without heating

FIGURE 2

Moldova's electricity production and supply 2010-2023

- Renewables
solar, wind, hydro and biogases
- Oil
- Natural gas
- Imports
includes procurement from MGRES



Sources: IEA World Energy Statistics and Balances (database), 2022 and NBS, 2022.

NOTE Excluding data on districts from the left side of the river Dniester and municipality Bender.



MDL 700

the average Moldovan spent more than MDL 700 per month on utility bills in 2022



15%

approximately 15% of average monthly income



25%

Only 25% of walls, floors and ceilings in Moldovan homes are insulated

Key context for Moldova

Traditional heating methods such as natural gas boilers and solid fuel stoves remain prevalent in Moldova. District heating systems, fuelled by natural gas, biomass or coal, serve urban areas and provide centralised heating to multiple households. Increasingly, renewable energy sources like biomass boilers and solar thermal systems are gaining traction, offering cleaner and more sustainable alternatives.

The energy consumption of existing buildings in Moldova is high, as the majority of them are old and do not match current energy efficiency standards. The average Moldovan urban household spent MDL 1 588 (EUR 82) per month on utility

bills in 2022, or approximately 15% of their average monthly income.

According to the latest household energy consumption survey conducted by the Moldovan National Bureau of Statistics in 2022, only around 25% of the walls, floors and ceilings of homes and apartments in Moldova are insulated. Proper insulation can reduce heat loss from buildings, creating a more stable and controlled indoor environment, while limiting energy bills. Well-insulated homes also provide ideal settings for heat pumps, since they can operate more efficiently as they encounter fewer challenges in maintaining the desired temperature.

What is a heat pump?

A heat pump uses technology similar to what is found in a refrigerator or an air conditioner, but it works in reverse. It extracts heat from a source – the surrounding air, geothermal energy stored in the ground, or even waste heat from a nearby factory. It then amplifies and transfers the heat to where it is needed.

What are the benefits?

In Moldova, where the climate is characterised by cold winters and hot summers, adopting efficient and versatile heating technologies is essential. Heat pumps are particularly well-suited to meet energy needs in the country, since certain models can provide both heating and cooling.

Because most heat is transferred rather than generated, heat pumps are far more efficient than conventional heating technologies. In fact, current models are 3-5 times more energy efficient than gas boilers. They can also be cheaper to run.

There are wider advantages to installing more heat pumps as well. The International Energy Agency estimates that they have the potential to reduce carbon dioxide (CO₂) emissions by at least 500 million tonnes globally in 2030 – making it a key technology as countries work to bolster energy security and make their energy systems more sustainable.

Heat pumps also can be combined with other heating systems, such as those using gas, in hybrid configurations.



Heat pumps could help reduce CO₂ emission by at least 500 million tonnes in 2030 globally



Equal to the annual emissions of all cars in Europe today

1 Absorbing heat from outside

A heat pump collects warmth from the outside, which it uses to turn refrigerant, in its pipes, into vapour.

2 Bringing heat inside

The gathered vapour is compressed to heat it further, and transported into your home, releasing heat.

3 Releasing heat indoors

The super-hot gas passes its heat to the heat transfer medium, warming up the area. During this step, the vapour transforms back into a liquid.

4 Cooling down liquid

This liquid passes through a special valve, rapidly cooling it down to prepare for absorbing the outside heat.

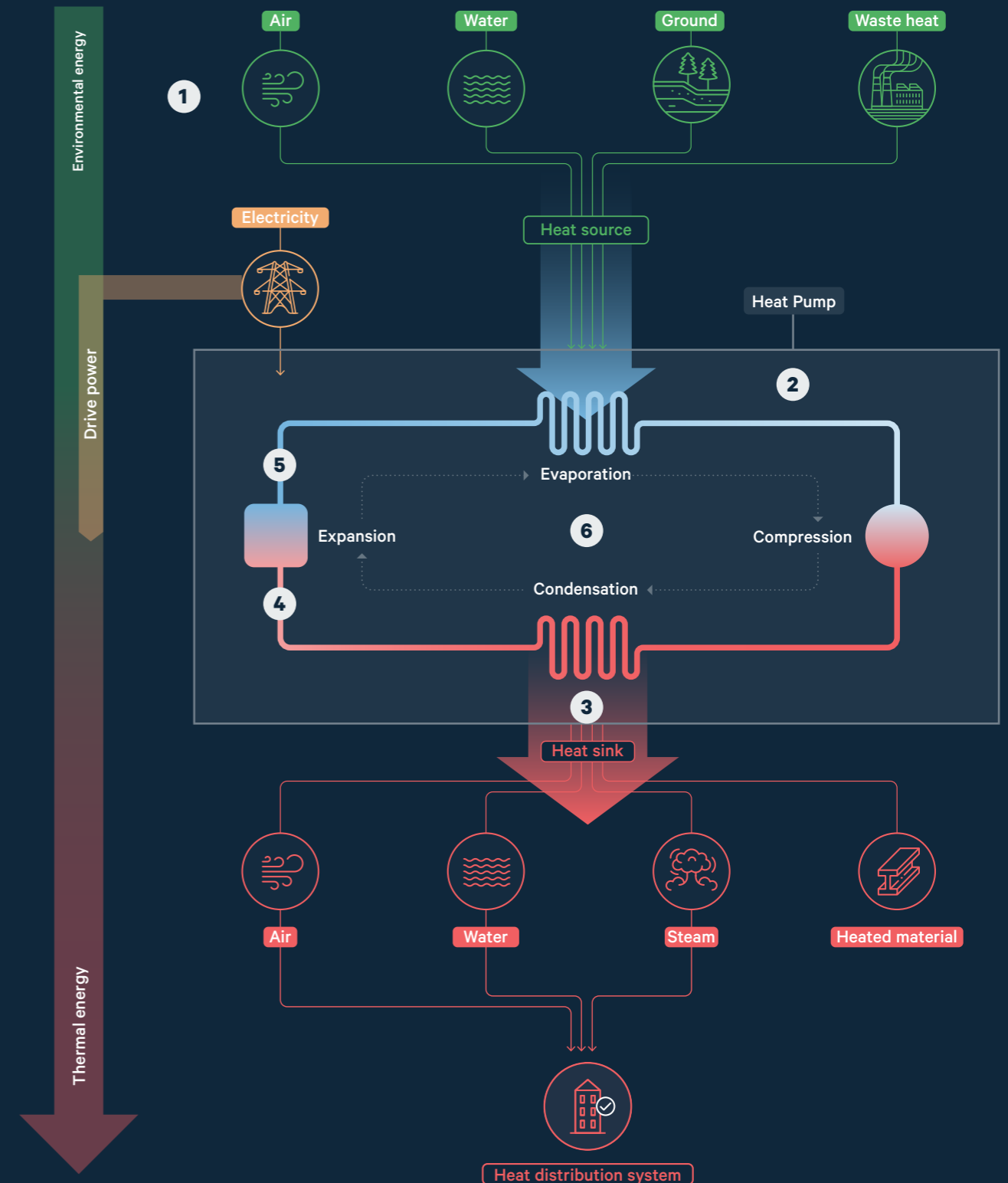
5 Optional cooling

Alternatively, the heat pump can reverse the process. It takes warmth from the inside and releases it outside, similar to opening a window to let out warm air.

6 Continuous cycle

The heat pump maintains a repeating cycle, either bringing warmth in to heat your home or moving warmth out to cool it down.

How does a heat pump work?



What heating options currently exist?

When it comes to home heating, consumers have a diverse array of options, from traditional systems that run on fossil fuels to cutting-edge sustainable solutions. This overview of technologies available globally allows for a closer examination of their individual characteristics and their potential role in achieving secure, sustainable heating for households in Moldova.



Air-to-Water
Heat Pumps

These heat pumps use heat from the air outside to heat water for your radiators or underfloor heating. Since they move heat in and out of buildings instead of generating it, they are 304 times more energy efficient than fuel-based or electric heaters.

Air-to-water heat pumps are usually connected to a tank that provides hot water for heat distribution systems, bathrooms and kitchens. Some models also provide space cooling. They run on electricity, and when installed in well-insulated homes they can achieve significant energy bill savings.

Capacity
Heating, hot water and cooling

Average lifespan
15-18 years

Powered by
Electricity

Heats through
Radiators, underfloor heating

Energy bills
Up to 50% lower than for gas boilers. Savings are approximate and may vary.



Air-to-Air
Heat Pumps

Air-to-air heat pumps use heat from the air outside to heat your home through in-room blowers or vents. As with air-to-water heat pumps, they are also 3-4 times more energy-efficient than fuel-based or electric heating systems.

Air-to-air heat pumps are ideal for homes without radiators or underfloor heating. They can also provide space cooling. Some models can be combined with water tanks to provide hot water for bathrooms and kitchens.

Capacity
Cooling, heating

Average lifespan
12-15 years

Powered by
Electricity

Heats through
Blowers

Energy bills
Up to 50% lower than for gas boilers. Savings are approximate and may vary.



Ground source Heat Pumps

Ground source heat pumps use heat from the ground outside to heat water for your radiators or underfloor heating. They are 4-5 times more energy efficient than fuel-based or electric heating systems.

Ground source heat pumps – as well as water source heat pumps that absorb heat from a nearby river, lake or pond, or from groundwater – are also more energy efficient than air-source heat pumps, as ground and water temperatures stay relatively stable compared with outdoor air temperatures.

Capacity
Heating, hot water

Average lifespan
20-25 years

Powered by
Electricity

Heats through
Radiators, underfloor heating

Energy bills
Up to 50% lower than for gas boilers. Savings are approximate and may vary.



Solar Thermal Heaters

Solar thermal heaters use solar collectors on the roof to produce hot water. While this hot water is mainly used in bathrooms and kitchens, it can also contribute to meeting your space heating needs if combined with other heating systems such as heat pumps.

When utilised in this way, solar thermal heaters can lower the energy costs of the system with which they are combined. They have lifespans of 15-20 years.

Capacity
Heating, hot water

Average lifespan
15-20 years

Powered by
Electricity

Heats through
Radiators, underfloor heating

Energy bills
Solar energy can lower the energy costs of the system it's combined with.



District Heating

Heat networks, available in some areas, are centralised systems that distribute heat to your home through underground pipes. District energy networks transfer heat to radiators or underfloor systems and might also provide hot water for bathrooms and kitchens. Some systems can also cool connected homes.

They run on various energy sources, such as combined heat and power plants or large-scale heat pumps, depending on the network.

Capacity
Heating, hot water and cooling

Average lifespan
20-25 years

Powered by
Various sources

Heats through
Radiators, underfloor heating

Energy bills
Up to 50% lower than for gas boilers. Savings are approximate and may vary.



Biomass Boilers

Biomass boilers burn wood pellets, chips or logs to heat water. This water then provides heat to radiators or underfloor systems. Other biomass heating systems, such as stoves, can heat a single room and can be combined with a boiler for hot water for bathrooms and kitchens.

Biomass heating systems can also be used in combination with solar thermal heaters or heat pumps. When installed in well-insulated homes, they can achieve significant energy bill savings.

Capacity
Heating, hot water

Average lifespan
20-25 years

Powered by
Biomass

Heats through
Radiators, underfloor heating

Energy bills
Up to 50% lower than for gas boilers. Savings are approximate and may vary.



Electric Radiators

Electric radiators are stand-alone units that generate heat by passing an electric current through a resistor. Households using electric radiators for space heating also need a hot water system such as a heat pump or electric water heater.

Energy bills are typically higher than for other technologies, and their lifespans are shorter, at about 10-12 years.

Capacity
Heating

Average lifespan
10-12 years

Powered by
Electricity

Heats through
Radiators

Energy bills
Higher than for other technologies.



Gas Boilers and Furnaces

Gas boilers and furnaces utilise natural gas to heat water for radiators or underfloor systems while distributing warmth via forced-air systems. These systems also cater to daily hot water needs in homes. Notably, nine European countries have initiated or announced bans on exclusive natural gas boiler installations, with similar measures in certain regions of North America and China.

Compared with low-emissions options like heat pumps, gas boilers and furnaces consume more energy. They typically have a lifespan of 15-17 years.

Capacity
Heating, hot water

Average lifespan
15-17 years

Powered by
Gas

Heats through
Radiators, underfloor heating

Energy bills
Higher than for low-emitting systems such as heat pumps.

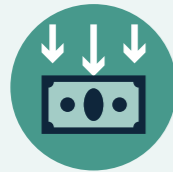
Sources

2024



Energy performance standards for buildings

2024



Residential Energy Efficiency Fund

102 M€

budget of nearly MDL 2 billion (EUR 102 million)

70%

Covers up to 70% of the total costs of implementing energy efficiency measures

Moldova's home heating transition

Not all of these heating technologies are widely used or available in Moldova right now, though the country is currently exploring initiatives and incentives to transition to a more secure and sustainable energy system, including for home heating.

In 2024, the country implemented energy performance standards for buildings, which establish minimum requirements for energy efficiency in newly constructed sites and for major renovation projects. The goal is to reduce energy consumption, lower heating and cooling costs, and improve indoor comfort and air quality, based on international standards – with the new standards specifying parameters for thermal insulation, air tightness, heating and cooling system efficiency and renewable energy integration.

The Residential Energy Efficiency Fund, which was also launched in 2024 with a budget of nearly MDL 2 billion (EUR 102 million), further aims to modernise Moldova's housing sector and reduce gas consumption, while decreasing CO₂ emissions and utility bills for households. The fund aims to cover up to 70% of the total costs of implementing energy efficiency measures.

Other initiatives – such as those focused directly on supporting heat pump uptake – could also boost their usage in Moldova. To succeed, these measures should be well-tailored to the country's needs, be sufficiently funded, and involve consistent engagement with all stakeholders.



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Moldova



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