

# Replace Your Heating System Calculator

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21.06.2022

"CLEAN ENERGY FOR PEOPLE" Online Conference



[replace-project.eu](https://replace-project.eu)

[energieinstitut.at/tools/Replace](https://energieinstitut.at/tools/Replace)

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*Disclaimer: The views expressed in this presentation are the sole responsibility of the author and do not necessarily reflect the views of the REPLACE consortium*



This project has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 847087.



# The Replace Your Heating System Calculator

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# The Replace Your Heating System Calculator



## Purpose

- To enable informed decision making regarding the choice of heating system
- To support easy, do-it-yourself and independent energy advice (free of charge)
- To be used in the residential heating sector (consumers, investors, owners), private and public advisors of residents



# The Replace Your Heating System Calculator

## Scope



- **Replacement** – of an **existing, old heating system** (boiler or ovens) using **oil, gas, electricity, coal, log-wood**  
– by **new, clean and climate-friendly** solutions.
- Adapted to **8 European regions** (AT, BiH, DE, BG, ES, HR, MK, SL) and **works in 8 languages** (incl. EN for every region)
- Features **technical and economic default values** for residential buildings **up to 1 000 m<sup>2</sup> or 200 MWh/a**.


▼	Please choose ...
	Oil boiler
	Gas boiler
	Air heat pump
	Groundwater heat pump
	Geothermal heat pump
	Collector heat pump
	Log wood boiler
	Pellets boiler
	District or local heating grid
	Woodchips boiler
	Liquefied gas boiler
	Infrared or direct electric heating



# The Replace Your Heating System Calculator

## Inputs

- ⇒ altitude
- ⇒ actual energy consumption
- ⇒ heated floor area of the building
- ⇒ number of occupants
- ⇒ age of current heating system
- ⇒ type of heat distribution
- ⇒ synergy with sanitary hot water
- ⇒ climatic parameters (HDD,  $T_{\min}$ )

 **Further adjustments**

- ⇒ investment
- ⇒ subsidies
- ⇒ fuel prices
- ⇒ service costs

⇒ possibility of a connection to a DHN

⇒ availability of a solid biomass fuel storage



# The Replace Your Heating System Calculator **Demonstration**

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[www.energieinstitut.at/tools/Replace](http://www.energieinstitut.at/tools/Replace)



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Slide #6



# The Replace Your Heating System Calculator

## "Expert mode"

Further adjustments possible

Heating system	Yearly costs
Log wood boiler	1.900€
District or local heating grid	2.800€
Pellets boiler	2.900€

<b>Investment costs</b> (Subsid. included)	<b>Annual cost savings</b>
9700 Euro	1400 Euro
<b>Annual CO<sub>2</sub> reduction</b>	<b>Comfort improvement</b>
7,3 tons	

**Necessary storage space:**  
Necessary space for pellets (when stored in a pellets bunker) = 5,8 m<sup>3</sup>, gross  
Necessary filling volume for pellets (when stored in a fabric tank system) = 3,5 tons, gross

**Further adjustments**

- PDF [Technologie-Datenblatt.pdf](#)
- PDF [Verfügbare Anreize für meine Region.pdf](#)
- PDF [Nützliche Kontakte.pdf](#)
- PDF [Best-Practice-Beispiel Ölkesslersatz durch Pelletskessel.pdf](#)
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**Fact-Box Pellets boiler**

The pellet heating system combines the advantages of wood heating with the convenience of an automatic system, with the comfort of an automatic system. Space for a pellet store is available instead of the oil tanks. Pellets are a standardised fuel that can ideally be stored as a year's supply.

Advantages: low fuel costs; renewable energy source; fits any building;  
Disadvantages: higher investment costs; higher maintenance costs;

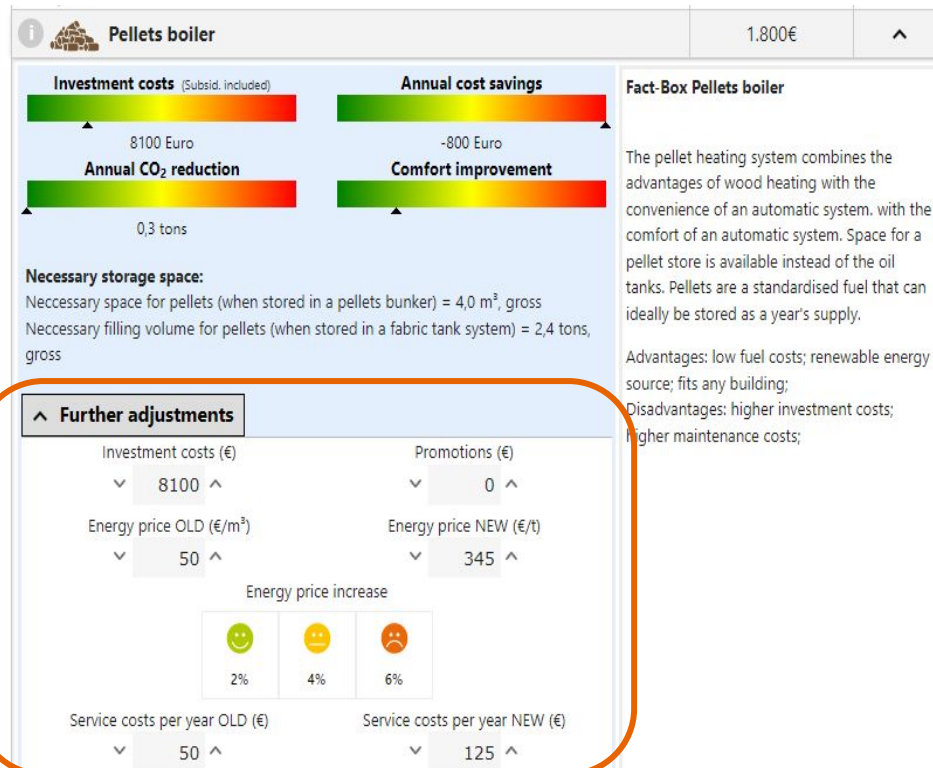


# The Replace Your Heating System Calculator

## "Expert mode"

Possible manual update of:

- investment,
- subsidies,
- fuel prices,
- service costs



**Pellets boiler** 1.800€

**Investment costs** (Subsid. included): 8100 Euro

**Annual cost savings**: -800 Euro

**Annual CO<sub>2</sub> reduction**: 0,3 tons

**Comfort improvement**

**Necessary storage space:**  
Necessary space for pellets (when stored in a pellets bunker) = 4,0 m<sup>3</sup>, gross  
Necessary filling volume for pellets (when stored in a fabric tank system) = 2,4 tons, gross

**Fact-Box Pellets boiler**  
The pellet heating system combines the advantages of wood heating with the convenience of an automatic system. Space for a pellet store is available instead of the oil tanks. Pellets are a standardised fuel that can ideally be stored as a year's supply.  
Advantages: low fuel costs; renewable energy source; fits any building;  
Disadvantages: higher investment costs; higher maintenance costs;

**Further adjustments**

Investment costs (€)	Promotions (€)
8100	0
Energy price OLD (€/m <sup>3</sup> )	Energy price NEW (€/t)
50	345
Energy price increase	
2% 4% 6%	
Service costs per year OLD (€)	Service costs per year NEW (€)
50	125





# The Replace Your Heating System Calculator Results



Heating capacity (main heating system) 7.5 kW

**Heating system** **Yearly costs**

Log wood boiler	700€
Air heat pump	900€

**Investment costs** (Subsid. included): 10600 Euro  
**Annual CO<sub>2</sub> reduction**: 0,7 tons

**Annual cost savings**: 1300 Euro  
**Comfort improvement**

**Fact-Box Air heat pump**

It is inexpensive to purchase because it does not require any investment in boreholes or groundwater wells. It works optimally with underfloor or wall heating and a low flow temperature. When it needs the most heat on cold days, it is most inefficient.

Advantages: low investment costs; small space requirement; can cool in summer;  
 Disadvantages: lower efficiency; noise emissions; not for unrenovated buildings;

**Further adjustments**

[PDF: Электрически термомомпи.pdf](#)

[PDF: Электрически термомомпи.pdf](#)

3 Result

All climate-friendly heating systems recommended for your house are listed below. Click on a system to get additional configuration options. Update ranking

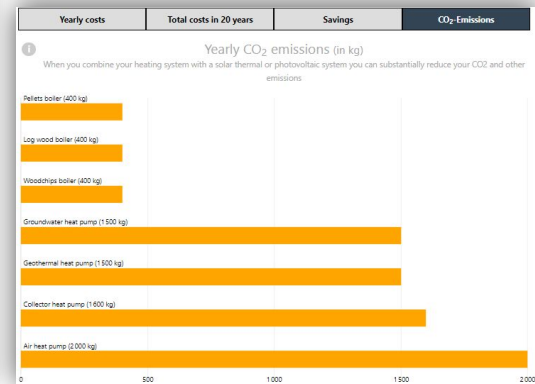
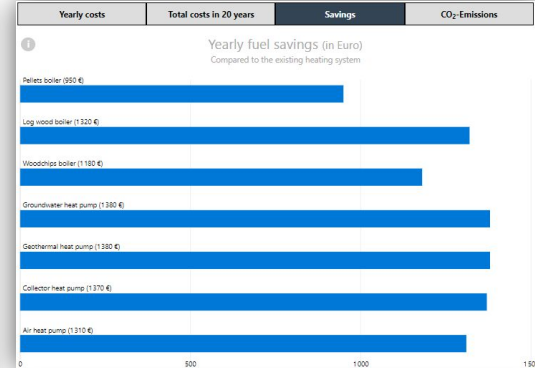
Heating system	Yearly costs
Log wood boiler	700€
Air heat pump	900€
District or local heating grid	1.000€
Pellets boiler	1.300€
Groundwater heat pump	1.300€
Woodchips boiler	1.400€
Collector heat pump	1.500€
Geothermal heat pump	1.500€

CO<sub>2</sub> price: 0 €/tons

Yearly costs	Total costs in 20 years	Savings	CO <sub>2</sub> Emissions
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**Yearly costs (in Euro)**  
Promotions included

System	Invest.	Maintenance	Fuel	CO <sub>2</sub> costs
Pellets boiler (387 € = 100 € + 787 €)	100	100	187	100
Log wood boiler (338 € = 64 € + 348 €)	64	100	174	100
Woodchips boiler (871 € = 230 € + 593 €)	230	100	541	100
Groundwater heat pump (988 € = 102 € + 252 €)	102	100	786	100
Geothermal heat pump (1173 € = 77 € + 252 €)	77	100	996	100
Collector heat pump (1140 € = 77 € + 258 €)	77	100	963	100
Air heat pump (530 € = 64 € + 336 €)	64	100	366	100



# The Replace Your Heating System Calculator

## **Conclusions 1/2** (Bulgarian context, June 2022)



- ✓ The calculator gives **meaningful results** and is **easy to use** for comparing multiple scenarios.
- ✓ The “tricky” step is the **investment estimation** ⇨ recommended to be based on offers and/or done with a consultant.
- ✓ Not suited to buildings with multiple fuels (e.g., co-firing wood & coal)
- ✓ The “Comfort” evaluation is qualitative – not included in the ranking.



# The Replace Your Heating System Calculator

## **Conclusions 2/2** (Bulgarian context, June 2022)



- ✓ The **Bulgarian pilot region** results are affected by **some specifics**:
  - No subsidies/promotions in most municipalities
  - Non-market (relatively low) prices of electricity for households
  - No cost for emissions (for households)
  - Relatively low prices of log wood
- ✓ Typically, **LOG-WOOD** is ranked as the most feasible (financially) alternative, followed by **AIR-TO-WATER HEAT PUMP**



# Contact

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This project receives funding from the European Union's Horizon2020 research and innovation programme under grant agreement No. 847087.

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## Further info:

[www.replace-project.eu](http://www.replace-project.eu)

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