Seminar Paper on

EU Energy Performance of Buildings Directive - Evaluation of National Implementations in CZ and AT and their effectiveness

Author(s):

David Drechsler (CTU in Prague)

Florian Ostler (BOKU University)

Outline

1. Introduction

After the European elections in 2019, the European Commission (EC) introduced their plans for a European Green Deal with the overarching goal to be the first climate neutral continent until 2050. A step into the direction of climate neutrality was first legally anchored in 2021, where the milestone of reaching a greenhouse gas (GHG) emission reduction of 55% compared to the levels of 1990 until 2030 was set in the EU-climate act. To reach this goal, the EU has announced their "renovation wave strategy" with the aim to "[…] *double renovation rates in the next ten years and [to] make sure renovations lead to higher energy and resource efficiency"* (European Commission, 2025). To make sure this strategy is enforced, the European energy and climate policy framework was reviewed and the requirements for national targets and instruments were tightened. (Gebäudeforum.de, 2025a)

Central legislative endeavors for the decarbonization of buildings are namely the Renewable Energy Directive (RED), the Energy Efficiency Directive (EED), the European Union Emissions Trading System (ETS), the Eco Design-Guideline and finally, the Energy Performance of Buildings Directive (EBPD). (Gebäudeforum.de, 2025a) This paper will especially focus on the last directive, looking at the key points established through this framework and how it is nationally implemented on national level in Austria (AT) and Czech Republic (CZ).

The EPBD is a key piece of legislation in the European Union's efforts to improve energy efficiency and reduce carbon emissions from the building sector, which accounts for nearly 40% of total energy consumption and 36% of the total GHG emissions in the EU.

Evaluating how member states implement this directive, such as the CZ and AT, is crucial for understanding the effectiveness of national strategies and identifying best practices or implementation gaps. Comparing these two neighboring countries provides valuable insights into how different regulatory, economic, and technical approaches influence the success of energy efficiency measures in buildings — a sector critical to achieving the EU's climate and energy goals.

This seminar paper first looked at the question of how the EPBD is structured and with which measures the energy performance of buildings will be made more efficient in the EU. Following that, the implementations of the EPBD were looked at on a national level. Here, we accessed the "zákona č. 406/2000 Sb., o hospodaření energií" in CZ and for AT, we especially looked at the "OIB-Richtlinie 6". This was accompanied by a closer look at the objectives anchored in the legislatives of the respective countries.

Following this, a technical-economic model was developed to be able to economically compare the effectiveness of the energy savings legislature in buildings for both countries.

Concluding from the previous findings, the last objective was to compare both countries to all other EU-27 members to firstly find out how effective the national implementations of the EPBD perform both in CZ and AT and how energy efficiency will develop in the future.

The results of this seminar paper are based on extensive literature research. Most literature was found through web search with key words such as "Energy Performance of Buildings Directive, European energy legislation, etc." with subsequent snowball research. Complementing the web search, the official websites of the European Commission were searched for official statistics and legal texts in the energy efficiency context. To validate the statements made on the official websites, monitoring reports by third-party regulating authorities were also added to the literature list. Additionally, to the conventional way of researching, artificial intelligence (mainly ChatGPT) was used in the process to ensure all relevant literature has been included and are the most recent versions.

To gain an overview of the objectives and ambitions of the EPBD, the research began by accessing the underlying legal texts, which were freely available for download on the European Commission's website.

The OIB-Richtlinie 6, Austria's implementation of the EPBD, could also be found on Austria's institute for construction technique official website. Within the Richtlinie, especially the technical aspects

For the elaboration of this material in CZ, the basis was mainly Act No. 406/2000 Coll., the Energy Management Act, which defines the state and territorial energy concept of the Czech Republic, buildings and their energy management, including mechanisms for reducing the energy consumption of buildings. The Act also deals with the ecodesign of energy-consuming products.

The technical-economic model developed in this paper serves as visualization of energy savings legislature and pricing measurements for increasing energy efficiency of buildings in both countries. The building chosen was a family house with identical dimensions, construction materials and other technical equipment. However, the inputs will differ in both countries, such as price of insulation material, new renewable energy source or financial support from subsidy programs of each country.

Input data for the model were researched through the internet from various sources, governmental and enterprise data, which are cited at the end of this paper.

2. EU Energy Performance of Buildings Directive

2.1 General Aims of the EBPD

The EPBD establishes a framework that is aiming at improving the energy performance of buildings – residential and non-residential alike – across the EU, which include both new and existing buildings undergoing extensive renovation. Within the EPBD, requirements for energy efficiency standards, energy performance certifications and for the inspection of heating and air-conditioning systems are set out.

Since its first publishing in 2002, the EPBD was recast three times, with the latest version released in May 2024. The first version of the EPBD (Directive 2002/91/EC) was introduced as the initial framework for energy performance standards in buildings. Included here were requirements for energy certification as well as regular inspections of boilers and air-conditioning systems. With the recast of 2010 (Directive 2010/31/EU), provisions were strengthened, and the concept of nearly-zero-energy buildings (nZEBs) were introduced, which meant that all new buildings as of 2020 must have a high energy performance and very low energy needs, with the energy coming from onsite renewable energy sources (European Commission, 2025b). The revised version of 2018 (Directive 2018/844/EU) promotes smart technology, builds automation and long-term strategies, aligning with the EU's "Clean Energy for All Europeans"-package. (European Commission, 2025a)

The amendment of the EPBD in 2024 (Directive (EU) 2024/1275) and the EED (Directive (EU) 2023/1791) will result in new requirements for the building sector. Both directives are part of the EU Commission's "Fit for 55" package and are intended to help achieve CO2 reductions by 2030. On the one hand, reference is made to specific requirements for structural characteristics and specifications in the building sector. On the other hand, new measuring instruments and orientation values are also to be introduced to make building energy efficiency more visible and measurable. (European Commission, 2025a)

The clear objective is to improve energy efficiency and achieve an emission-free building stock by 2050. The EU Buildings Directive in particular addresses key aspects of the buildings sector, including improving overall energy efficiency, creating infrastructure for sustainable mobility and building-integrated energy generation and introducing central points of contact for information and advice.

The Energy Performance of Buildings Directive (EPBD) is divided into five chapters, each detailing essential measures to improve building energy efficiency in the EU.

Articles 1 to 2a set the foundation. Article 1 outlines the directive's goal: enhancing energy performance in buildings to support EU climate targets. Article 2 provides key definitions, such as what qualifies as an energy performance certificate (EPC) or a nearly zero-energy building (nZEB). Article 2a requires Member States to submit long-term renovation strategies (LTRS) to achieve a decarbonized building stock by 2050, with intermediate targets for 2030 and 2040. (European Commission, 2024)

Articles 3 to 8a focus on technical implementation. Article 3 mandates that each country must define a method to calculate building energy performance based on EU norms. Article 4 obliges them to set minimum energy performance standards, while Article 5 introduces cost-optimality—ensuring energy savings are financially justified. Article 6 addresses new buildings, requiring them to meet minimum standards and, from 2028 (public) or 2030 (all), be zero-emission. Article 7 ensures that renovations also raise performance to appropriate levels. Article 8 regulates technical building systems (like heating, lighting, or ventilation) to ensure they're efficient when installed or upgraded. Article 8a introduces the Smart Readiness Indicator (SRI), which evaluates a building's capacity to adapt its energy use using smart technologies (e.g., automatic lighting or heating control). (European Commission, 2024)

Articles 9 to 18 relate to certification and inspections. Article 9 enforces the construction of nZEBs, while Article 9a introduces the new category of zero-emission buildings. Article 10 encourages financial incentives to support renovations. Articles 11 to 13 regulate EPCs: Article 11 defines their content, Article 12 details issuance rules, and Article 13 mandates their display in public or frequently visited buildings. Articles 14 to 16 require regular inspections of heating and cooling systems. Articles 17 and 18 ensure EPCs and inspections are conducted by independent experts and are checked for quality through national control systems. (European Commission, 2024)

Articles 19 to 21 deal with review and public awareness. Article 19 requires periodic reviews of the directive by the EU Commission. Article 19a promotes optional tools like renovation passports or voluntary smart-readiness ratings. Articles 20 and 21 focus on information and consultation—ensuring that citizens and stakeholders are well-informed and involved. (European Commission, 2024)

Articles 22 to 25 contain legal finalities. Article 22 sets transposition deadlines for Member States. Article 23 repeals the earlier 2002 version of the EPBD. Article 24 defines when the directive enters into force, and Article 25 specifies that it applies to all EU countries. (European Commission, 2024)

EU directives as such are legislative acts that set out a goal that all EU countries must achieve. The implementation of those into national law, however, is up to each country, as long as the goals are achieved. In general, the implementation period is 24 months after the directive comes into force. In some cases, separately mentioned exceptions are possible (European Union, 2025). The following sub-chapters will compare the implementations of both AT and CZ to the EPBD to investigate how their versions differentiate to the directive.

2.2 The “OIB-Richtlinie 6” in AT

The OIB-Richtlinie 6 (English: OIB-Guideline 6) is one of in total 6 guidelines developed by the Austrian Institute for Construction Technology (Österreichisches Institut für Bautechnik = OIB). They serve the purpose of harmonizing construction law throughout all nine provinces of Austria, as building regulations in Austria are a matter for those. (OIB, 2025a)

Guidelines 1-5 focus on mechanical stability, fire protection, hygiene health and environmental protection, sound insulation and safety of use and accessibility. Guideline 6 on the other hand concentrates on Energy saving and thermal insulation, for which it mainly derives its measures from the EBPD as well as the EED. A seventh OIB-Guideline about the sustainable use of natural resources is currently under review. (OIB, 2025b)

Austria implements the technical aspects of the EPBD primarily through OIB-Richtlinie 6, a national guideline issued by the Austrian Institute of Construction Engineering (OIB). This guideline plays a central role in regulating energy efficiency standards for buildings across Austrian federal states. The latest version of the OIB-Richtlinien was published in May 2023, before the newest amendment of the EPBD.

OIB-Richtlinie 6 includes several key elements required by the EPBD. It establishes a harmonized methodology for calculating the energy performance of buildings, based on European standards (EN ISO), and defines minimum energy performance requirements depending on the building’s use and climate zone. The guideline also serves as the technical foundation for issuing Energy Performance Certificates (EPCs), which are mandatory in the sale, lease, and construction of buildings. Additionally, it incorporates criteria for nearly zero-energy buildings (nZEBs) in line with the 2010 recast of the EPBD, applying to both residential and non-residential new constructions. (Meszaros, 2023)

However, OIB-Richtlinie 6 is strictly a technical document and does not address many of the broader governance and policy elements introduced in later versions of the EPBD. Specifically, it does not include requirements for long-term renovation strategies (LTRS) as required by Article 2a of the EPBD. Furthermore, it omits the Smart Readiness Indicator (SRI), which assesses a building’s capacity for digital control and interaction with energy grids. The guideline also lacks provisions for the calculation of Global Warming Potential (GWP) of buildings, a new requirement under the 2024 EPBD revision applicable to new buildings from 2030 onward. Moreover, renovation passports, another recent EPBD innovation to guide long-term building upgrades, are not addressed in OIB 6. Regular system inspections (e.g., heating, cooling) are handled by other legal instruments outside the scope of this guideline.

Thus, while Austria has a technically robust and compliant framework through OIB-Richtlinie 6, it will require further legislative and administrative measures to fully integrate the strategic and environmental assessment elements of the EPBD.

2.3 The “zákona č. 406/2000 Sb., o hospodaření energií” in CZ

The Czech Republic transposes the EPBD primarily through Act No. 406/2000 Coll. on Energy Management, a comprehensive law governing energy efficiency and performance in the building and industrial sectors. The Act has undergone multiple revisions, with the most recent being Act No. 469/2023 Sb., effective from January 1, 2024, which further aligns Czech legislation with EU climate and energy targets. As for Austria’s OIB guideline 6, the recast version of the law was published before the latest amendment of the EPBD. (CESKO ,2024)

The Act includes most of the core technical provisions of the EPBD. It mandates the preparation and presentation of Energy Performance Certificates (EPCs) during the sale, rental, or construction of buildings, and lays out national calculation methodologies for determining energy performance in line with European standards. It enforces minimum energy performance requirements for both new constructions and major renovations. Importantly, the Act defines and mandates the construction of nearly zero-energy buildings (nZEBs) required for public buildings since 2018 and for all new buildings since 2020. Furthermore, it stipulates regular inspections for heating and air-conditioning systems and mandates energy audits for large enterprises, thereby aligning with several key EPBD articles. (CESKO ,2024)

Despite this alignment, the Czech Act does not yet reflect several newer requirements introduced in recent EPBD amendments. Notably, it does not include the Smart Readiness Indicator (SRI), nor does it establish a legal framework for building renovation passports, which are encouraged by the EPBD to facilitate step-by-step improvements in building performance. While the Czech government has submitted a long-term renovation strategy (LTRS) to the EU as required, this is not embedded directly within the legislative framework of Act 406/2000. In addition, the Act currently does not require the calculation of Global Warming Potential (GWP) for new buildings, a critical life-cycle emissions metric that becomes mandatory under the EPBD from 2030. The law’s mechanisms for monitoring compliance and tracking the effectiveness of implementation are also less extensive than those envisioned in the latest EPBD revision.

In summary, the Czech Act No. 406/2000 Coll. ensures compliance with the technical and operational aspects of the EPBD but will require significant updates—particularly in relation to digital readiness, life-cycle carbon evaluation, and strategic renovation planning—to meet the full scope of the directive's 2024 iteration.

3. Model of Energy Savings

In the techno-economic model, we focused on one of the possibilities of saving energy in the family house, and that is saving energy for heating. We focused on insulating the external walls, the roof and replacing windows. As a result of this chapters, differences between Austria and Czech republic will be presented. Model houses are located near the main cities, i.e. near Prague and Vienna.

3.1 Technical part

As a building for comparison we have chosen a family house, which corresponds to the following values:

Dimensions of the house		
Height (roof)	2.9	m
Height (walls)	3	m
Length	12	m
Width	10	m
Built-up area	120	m2
Roof angle	30	°
Area of roof	155.6	m2
Area of walls	160.9	m2
Area of windows	16.1	m2
Number of windows	10	-

These figures reflect a typical single-story house with four rooms and a kitchen. Following this data, typical thermal technical parameters for each individual material were determined by searching world wide web, using ChatGPT or information gathered in subjects at university courses and serve as reference values. The observed properties of the materials (their thickness and thermal properties) are given in the tables in the annex.

For calculation of heat demand we used formulas below:

1. **Thermal Transmittance of a Structure**

$$U = \frac{1}{R} = \frac{1}{\sum R_i}$$

- $R_i = d_i / \lambda_i$ ... thermal resistance of a layer
- d_i ... thickness of the layer [m]
- λ_i ... thermal conductivity [W/(m·K)]
- R ... total thermal resistance of the structure [m²·K/W]

2. Thermal Resistance Including Surface Resistances

$$R = R_{si} + \sum \frac{d_i}{\lambda_i} + R_{se}$$

3. Specific Heat Loss by Transmission

$$H_T = \sum (U_i \cdot A_i)$$

- H_T ... specific heat loss [W/K]
- U_i ... thermal transmittance of individual elements
- A_i ... surface area of those elements

4. Specific Heat Loss by Ventilation

$$H_V = 0{,}34 \cdot n \cdot V$$

- H_V ... specific heat loss through ventilation [W/K]
- n ... air exchange rate [1/h]
- V ... volume of the heated space [m³]

5. Total Heat Loss of the Building

$$H = H_T + H_V$$

- H ... total specific heat loss [W/K]

6. Heating degree days

$$HDD = \Sigma max\left(0, T_{ref} - T_{es}\right)$$

$$from\ i = 1\ to\ n$$

- T_{ref} ... reference temperature (e.g., 13 °C), condition, when heating season starts
- T_{es}... average outdoor temperature on day *i* [°C]
- n ... number of months in the heating period (year)

In Czech Republic, the heating season starts on 1 September and ends on 31 May. The heating starts if the average daily temperature falls below 13 °C on two consecutive days and the weather forecast does not expect the temperature to rise above this level on the following day.

In Austria there is no uniform national legislation. Generally, heating is started when outside temperatures fall below a certain threshold, usually around 12-13°C, and the weather forecast does not indicate a significant warming.

7. Annual Heat Demand for Heating

$$Q = \text{H} \cdot \text{HDD} \cdot 24 \cdot 3600 \div 10^6$$

- Q ... annual heat demand [MJ/year]
- HDD ... heating degree days [K·day]
- Conversion to kWh (1 MJ = 0.2778 kWh)

The detailed results of the calculations are calculated using excel separately in the tables in the annex. The results of the heat demand for heating the house is in the following table:

Heat demand of the house before insulations		
Annual Heating Energy Demand CZ	21 867	kWh/year
Annual Heating Energy Demand AU	18 518	kWh/year
Heat demand of the house after insulations		
Annual Heating Energy Demand CZ	7 456	kWh/year
Annual Heating Energy Demand AU	6 314	kWh/year

With the proposed solution we have reduced the need for heating by 66 percent. Energy savings for heating after house insulation are 14,4 MWh/year in the Czech Republic and 12 MWh/year in Austria. The result differs due to the different number of heating degree days in both countries. Due to global warming and the reduction of the possible number of days of the heating period, we have deescalated the amount of energy saved for heating the family home.

For the calculations of real energy consumption we considered the following efficiencies:

Efficiencies	-
Efficiency of heat distriution systém	97%
Efficiency of heat pump	400%
Efficiency of gas boiler	95%
Efficiency of wood pellet boiler	90%

3.2 Economical part

Input values in the economical part of the model were searched through many websites and will be cited below in footnote.

The considered period for the evaluation of economic efficiency was chosen to be 20 years. However, our measures have a lifetime of more than 40 years, but for the evaluation of the efficiency of the investment this period is not meaningful.

As of 4 May 2025, the yield on the 20-year German government bond (Bund) is approximately 2.94%. This yield reflects the stability and low risk associated with German government bonds, which are considered a benchmark in the euro area. We have therefore chosen a discount rate of 3% for the project evaluation.

As of 4 May 2025, the CZK/EUR exchange rate is 25 and we consider this conversion in some calculations.

Electricity prices were considered from historical data for 2024[1]. In Austria, the subsidy was at EUR 0.06/kWh of electricity, but we did not take it into account in our calculations because it is not certain whether it will be further subsidised in the coming years.

Natural gas prices were considered from historical data for 2024[2].

Wooden pellets price were considered from historical data for 2024. In the model we considered the calorific value of wood pellets 17 MJ/t[3].

We escalated the prices of all forms of energy in the model by 2%.

Price of useful heat	CZ	AT	Units
Gas boiler	117.71	149.65	EUR/MWh
Wooden pellet boiler	81.89	68.18	EUR/MWh
Heat pump	91.31	97.20	EUR/MWh

Estimates of the duration of work on each part of the house were estimated by the ChatGPT artificial intelligence system, including a survey of the average hourly rate of an insulation and window replacement worker in buildings in both countries. Furthermore, this AI was used to find the average price of all materials in both countries.

The total investment differs in the two countries mainly due to the cost of labour. We have considered a default supplier margin of 50%, and we have further subjected this parameter to sensitivity analysis.

1 https://ec.europa.eu/eurostat/databrowser/view/nrg_pc_202/default/table?lang=en
2 https://aegis.acer.europa.eu/chest/dataitems/608/view?utm_source=chatgpt.com
3 https://www.globalwood.org/news/2024/news_20240626a.htm?utm_source=chatgpt.com

Price of work	CZ	AT	
Average hourly rate	8.53	19.68	EUR
Working hours	160	160	EUR
Duration of work on roof	100	100	hours
Duration of work on walls	200	200	hours
Duration of work on 1 window	5	5	hours
Duration of work on all windows	50	50	hours
Total work	355	355	hours
Total	3030	6986	EUR

Price of material	CZ	AT	
Price of EPS+accessory per m2	25.00	25.00	EUR
Price of walls insulation	4 021.69	4 021.69	EUR
Price of roof insulation	3 889.75	3 889.75	EUR
Price of 1 window	361.45	361.45	EUR
Number of windows	10	10	-
Price of fasade plaster	10.04	12.00	EUR/m2
Price of fasade plaster	1 615.14	1 930.41	
Total	13 141	13 456	EUR

Margin of supplier	50%	50%	-
Total investment	**24 256**	**30 663**	**EUR**

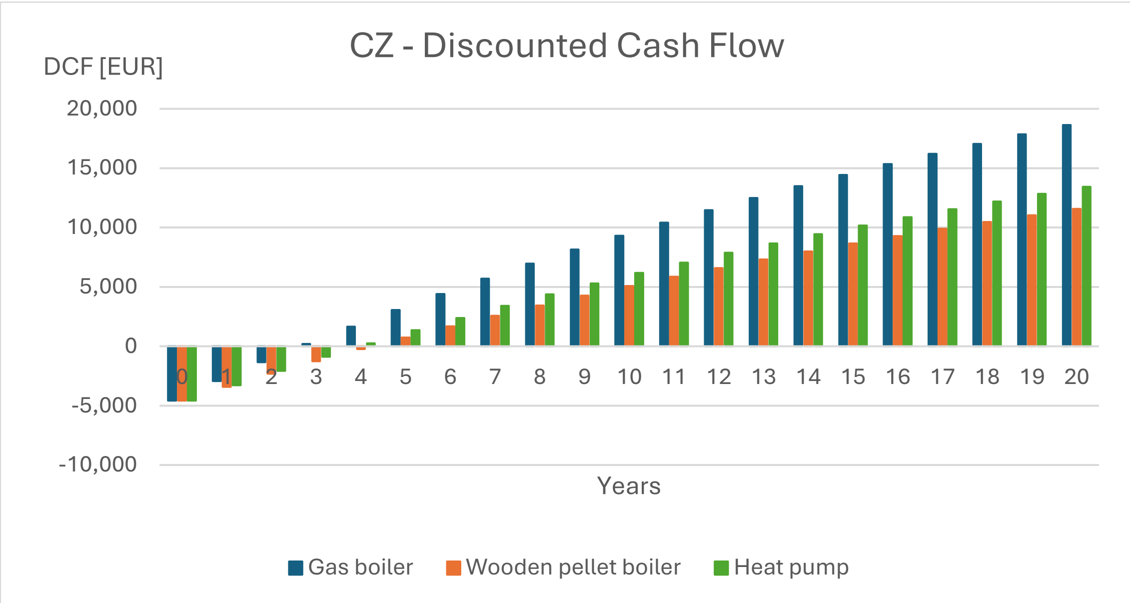
The subsidy programmes in the Czech Republic and Austria differ mainly in terms of calculation. In the Czech Republic the subsidy is allocated per square metre, but in Austria the subsidy is calculated as a percentage of eligible costs. Another difference is that in the Czech Republic there is a single subsidy programme for family houses called New Green Savings. In Austria, subsidies are drawn separately at state and federal level. This is done through the state programme Sanierungsbonus für Private 2024, which has been discontinued and a new subsidy programme will be proposed this year. We are counting on this program and also the federal program from Vienna, where our model is located[4].

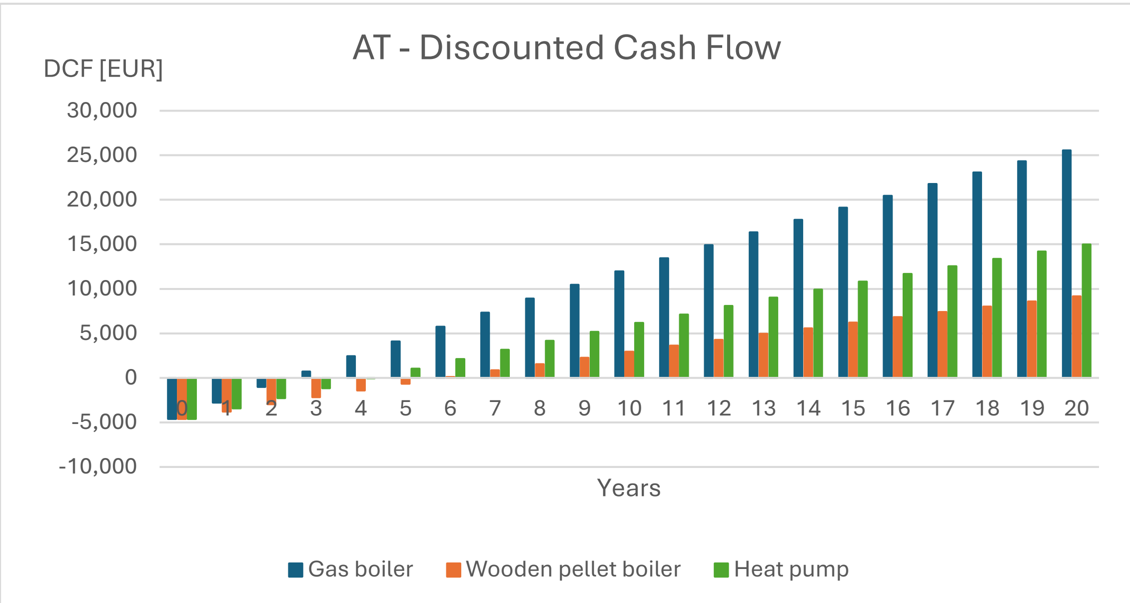
Subsidies Czech Republic	Amount	Units	MAX
Insulation of walls	52.21	EUR/m2	
New windows	197	EUR/m2	
Insulation of roof	52.21	EUR/m2	
Total	19 688	EUR	40 161

[4] https://sanierungsbonus.at/#ablauf

Subsidies Austria	Amount	% of invest.	MAX
State subsidy	15 332	50%	27 000
Federal subsidy (Wien)	10 732	35%	12 000
Total	26 064	EUR	

The differences between the two variants will be presented here. First, we will compare the investment payback periods:

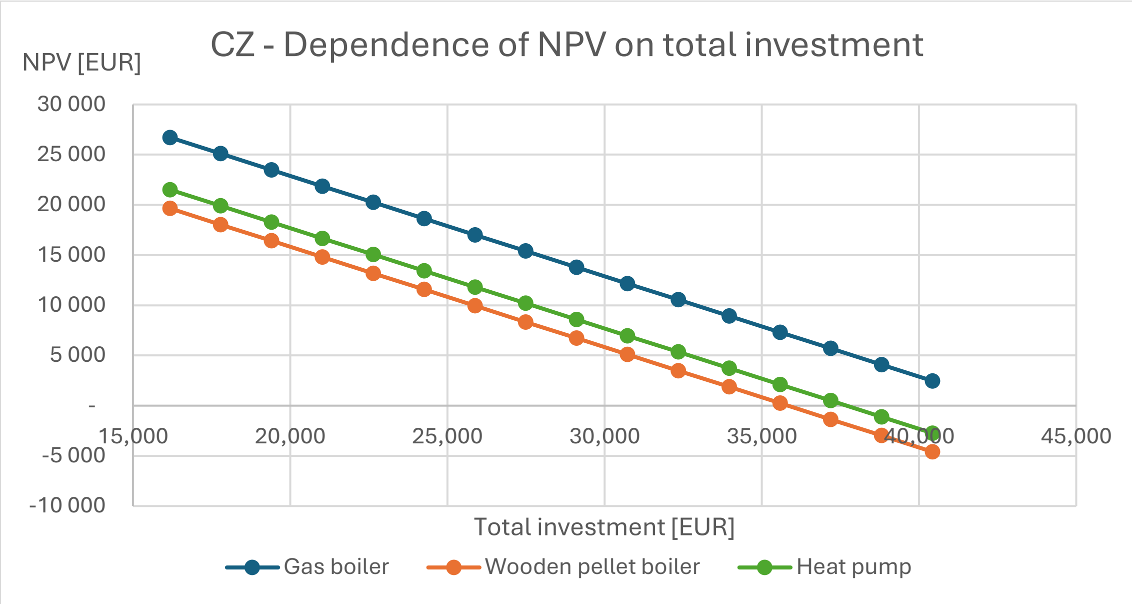


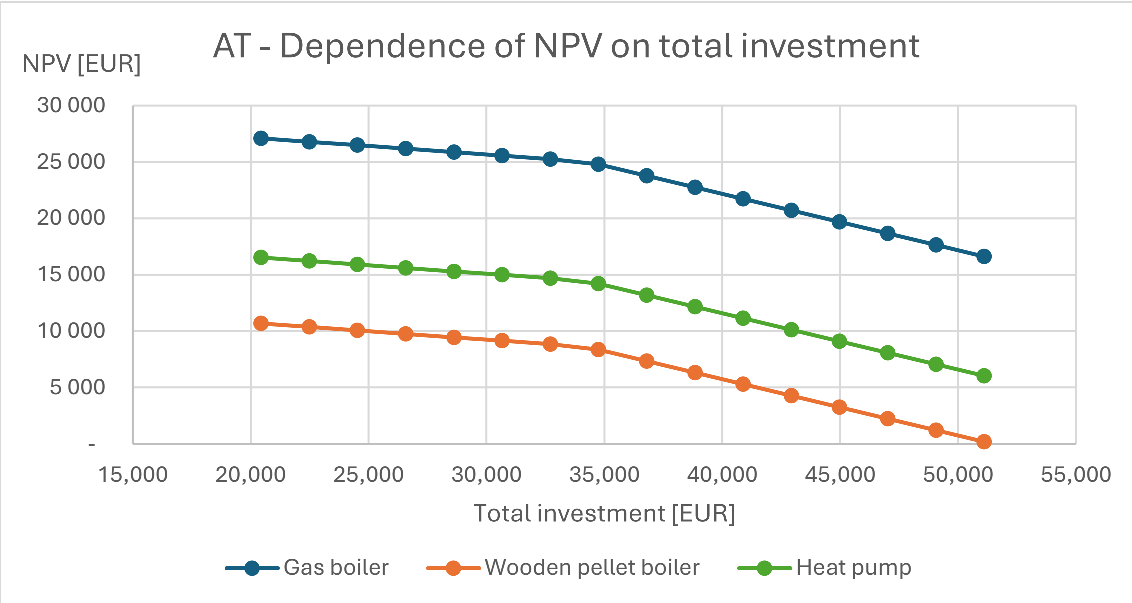


The graph of discounted cash flows over the period under review differs in the two countries. The payback period is given by the year when the discounted cash flow is greater than zero. In the case of the gas boiler, the payback period in the Czech Republic and Austria is three years.

Even though the price of gas in Austria is higher than in the Czech Republic, the payback period is approximately the same. This is mainly due to the lower primary energy demand per year.In the case of a wooden pellet boiler the payback period is 5 years in the Czech Republic and 6 years in Austria and for a heat pump the payback period is 4 years in the Czech Republic and 5 years in Austria. These differences are influenced by different energy prices and energy savings due to fewer heating degree days and therefore lower heat demand and thus lower energy savings.

For the gas boiler, we see that in year 20 the discounted cashflow (i.e. NPV) is higher in Austria than in the Czech Republic. This is mainly due to more expensive gas, where insulation increases the value of energy savings.





A sensitivity analysis of the dependence of the net present value on the initial investment shows a decreasing trend, i.e. the total benefit decreases with increasing investment. In the Czech

Republic, this trend is linear. In Austria, however, the trend changes and the net present value starts to decrease more. This is due to the subsidy policy of the Republic of Austria, where the subsidy is calculated as a percentage of the investment with a limitation on the amount. If the size of the investment is greater than EUR 35 000, the subsidy from the Land of Vienna is capped at EUR 12 000 and the subsidy does not increase further[5].

In the graph, it can be seen that the higher the present value, the greater the financial savings. The option with a gas boiler is the most beneficial because the price of gas is greater than other forms of energy.

In the Czech Republic, the savings are greater mainly due to the greater number of days when the house is heated, i.e. a greater number of heating degree days.

The following table compares the variants:

NPV	CZ	AT
Gas boiler	18 634	25 563
Wooden pellet boiler	11 573	9 142
Heat pump	13 431	14 992

The higher the NPV (net present value), the higher the benefit of the savings and the more appropriate it is to insulate the building. The differences between countries are mainly due to labour costs, climate and energy carrier prices.

3.5 Comparison of Austrian and Czech subsidy policy against the other nations of European Union

The European Union motivates Member States to reduce the energy performance of buildings through subsidies financed mainly by the Modernisation Fund, the Cohesion Fund and the REPowerEU initiative. However, the approach to the implementation of these funds varies considerably between countries.

The main instrument of support in Czech republic is the New Green Savings Programme (NGS), financed mainly from the Modernisation Fund. It provides subsidies for insulation of facades, roofs, floors and replacement of windows. The level of support is normally around 70%, but can be up to 100% in the case of the NZÚ Light programme (for the elderly and low-income households). However, the Czech Republic only gives one-off investments compared to other countries that offer tax breaks.

The Austrian subsidy system is based on the Sanierungsförderung programme, which combines direct subsidies (30-50% of costs) and tax breaks. Subsidies vary from one federal state to another. It is distinguished by its link to environmental standards such as klimaaktiv, the Austrian government's climate and energy programme, which serves as a quality label, advisory framework and assessment tool for sustainable construction, renovation and energy technologies.

[5] https://sanierungsbonus.at/#ablauf

The German subsidy system operates under the umbrella of BEG - Bundesförderung für effiziente Gebäude, which is administered by institutions such as KfW Bank and BAFA. It provides direct subsidies (20-40 %) and soft loans, based on energy standards achieved.

Poland operates the Czyste Powietrze (Clean Air) programme, which focuses on the replacement of non-environmental heat sources, insulation, and replacement of windows and doors.The programme provides a combination of subsidies and interest-free loans.The subsidy can be up to 90% for the lowest income groups, subject to household income limits. At the same time, Poland has introduced tax breaks.

4. Conclusion

The Energy Performance of Buildings Directive (EPBD) provides a comprehensive and ambitious framework aimed at decarbonizing the EU building stock by 2050. Both Austria and the Czech Republic have made significant progress in transposing the directive's core technical requirements into national law—Austria primarily through the OIB-Richtlinie 6 and the Czech Republic via Act No. 406/2000 Coll. on Energy Management. These national implementations reflect a strong alignment with earlier versions of the EPBD, particularly in areas such as energy performance calculation methods, minimum standards, EPC issuance, and the promotion of nearly zero-energy buildings.

However, both frameworks show gaps in addressing the newest aspects introduced in the 2024 revision of the EPBD. Notably, neither legal framework yet incorporates the Smart Readiness Indicator (SRI), building renovation passports, or the mandatory calculation of Global Warming Potential (GWP) for new buildings from 2030 onward. Additionally, long-term renovation strategies, though formally submitted, are not fully embedded in national legislative structures.

These shortcomings are largely due to the timing of national updates preceding the most recent EPBD amendment. To ensure full compliance and to contribute effectively to the EU's climate targets, both Austria and the Czech Republic will need to initiate further legislative updates that integrate these strategic, digital, and environmental performance components.

The aim of technical-economical model was to find out the differences between the insulation processes of a family house in the Czech Republic and Austria. In both cases the investment in insulation is worthwhile because the net present value of the options with gas boiler, wood pellet boiler and heat pump is positive. The biggest influences on the results are the price of the energy carrier, the cost of the work, the amount of the subsidy and the length of the heating period. Despite different calculations, the subsidy covered 80-85% of the investment costs in both countries. Other measures to increase the energy efficiency and environmental performance of buildings, such as replacing the heat source or installing a photovoltaic plant, can be further investigated.

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Annex

RP_Model_Drechsler_Ostler.xlsx

RP_Drechsler_Ostler_Calulation of heating degree days.pdf

RP_Drechsler_Ostler_Calulation of heat demand.pdf