

## ~ "Heating demand of the energy certificate halved" ~

Measured values of a single-family house in Litzelsdorf, which was built in 2020 as a wooden post-and-beam construction.

### Power Consumption Comfort Carbon Underfloor Heating

Measurement period: 01.07.2020 to 30.06.2021

Number of household residents: 2

Floor area: 109.10 m<sup>2</sup>

		Costs:
Total electricity consumption:	6,872 kWh	1,402 €
Household electricity:	2,500 kWh	510 €
Hot water, 100l/d, 50°C, E-boiler:	1,700 kWh	347 €

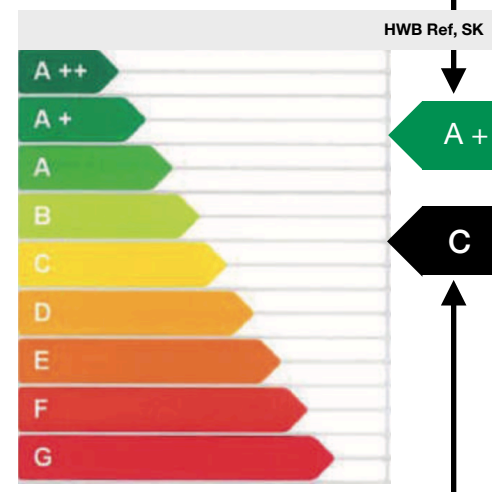
Measured consumption per square metre of floor space per year: 24.49 kWh/m<sup>2</sup>a

Consumption according to energy certificate: 51.08 kWh/m<sup>2</sup>a

Requirement for reference heating demand

**HWBref: 51.08 kWh/m<sup>2</sup>a**

Efficiency Class Illustration of the Energy Performance Certificate



### Testimony of the Residents:

*"It has never been so pleasantly warm our whole lives."*



"...the coldest and, above all, longest winter in years..."  
**Comparison Air-Water Heat Pump vs. Heat Parquet**

### Summer Consumption Heat Parquet

#### Description:

This is a single-family house which was built in 2018. The walls consist of 24 cm thick filled bricks and it is heated with thermal parquet. The floor coverings are parquet and tiles.

#### Electricity consumption:

All heating circuits run through one meter, so the total consumption is easy to read:

Measuring period:

End of October 2020 until end of June 2021:

Heating Consumption: 9,538 kWh

Heated Living Area: 214 m<sup>2</sup>

Consumption per m<sup>2</sup> p.a.: 44 kWh/m<sup>2</sup> p.a.

KfW Efficiency House 55



### Electricity Consumption Heat Pump

#### Description:

The reference single-family house is also located in Grabenstätt and was built in 2016. This house was built in a flocked timber frame construction. Heating and hot water are provided by an air-water heat pump.

#### Electricity consumption in the same period:

12,473 kWh deducted:

Household electricity: 2,100 kWh (LED, A++)

Hot water: 1,000 kWh

Sauna: 750 kWh

Heating Consumption: 8,623 kWh

Heated Living Area: 175 m<sup>2</sup>

Consumption per m<sup>2</sup> p.a.: 49 kWh/m<sup>2</sup> p.a.

KfW Efficiency House 39



#### Warmth Parquet Experience:

"A super luxurious heating system, that is very easy to use.

What I like most is the quick heat-up time of about an hour and the minimal loss of space as I don't need a boiler room. Absolutely recommendable."



#### Conclusion:

Both properties are new constructions built shortly one after the other in the same town. Despite the more efficient construction method, the house with a heat pump has an approx. 10% higher consumption. In addition, maintenance etc. is required for a heat pump, but this is not the case for the heat parquet.

This is a 90m<sup>2</sup> apartment in Neusiedl am See (built in 1955) that was renovated in 2019. It is located on the 1st floor and was moved into in July 2019. The exterior walls are 25 cm Zeigel with 10cm EPS-F insulation and triple glazing on the windows. Furthermore, there is a photovoltaic community system on the roof with 4.2 kWp (share per flat 13%) as well as an electricity storage (8 kWp - share per flat 13%).

**Electricity Consumption in the Billing Period**

Measurement period from  
17.07.2020 to 16.07.2021:  
Number of occupants: 1  
Temperature at least 24°C  
Floor area: 90 m<sup>2</sup>

Total electricity consumption: 5,059 kWh  
Household electricity: 1,800 kWh

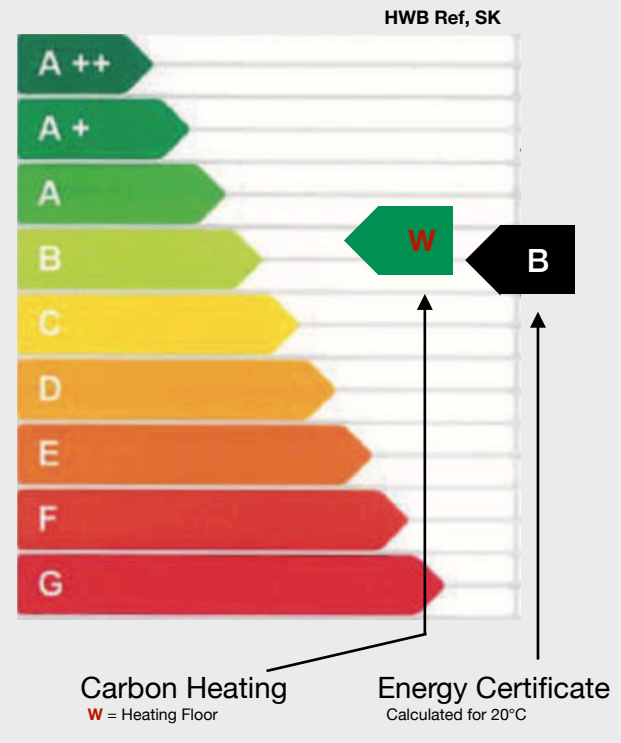
**Power Consumption Carbon Heating: 3,259 kWh**

Measured Consumption per square metre  
of floor space p.a:

**36.21 kWh/m<sup>2</sup>a**



Heating requirement according to the  
Energy Certificate:



Performed by:



"Low heating costs and super easy to  
use - very satisfied".



## New Construction: O.K. Energy House

This is a single-family house in Litzelsdorf that was built in 2018. It is heated with comfort underfloor heating. The floor coverings are parquet and tiles.

### Electricity Consumption

Grid supply:	9,058 kWh
Own consumption from PV system:	<u>2,240 kWh</u>
	11,298 kWh
Minus:	
Household electricity (estimated):	- 2,500 kWh
Hot water (E-boiler):	- 2,555 kWh
Central Ventilation System:	- 365 kWh

Total electricity consumption of the heating system:  
5,878 kWh/a for 178 m<sup>2</sup> of heated living space

**33 kWh/m<sup>2</sup>a**

### Photovoltaic Installation

Total Return:	5,500 kWh/a
Own Consumption:	2,240 kWh
Grid Feed-in:	3,260 kWh



### Costs

Heating costs without PV system at an electricity price of 0.18 €/kWh:

$$5,878 \text{ kWh} \times 0.18 \text{ €/kWh} = 1,058.04 \text{ €}$$

Heating costs with PV system:

Costs from grid purchase:

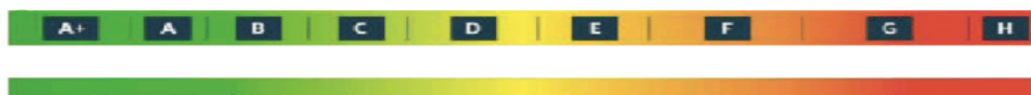
$$(5,878 \text{ kWh} - 2,240 \text{ kWh}) \times 0.18 \text{ €/kWh} = 654.84 \text{ €}$$

Deduction of feed-in tariff of 0.06 €/kWh:

$$(3,260 \text{ kWh} \times 0.06 \text{ €/kWh}) = 459.24 \text{ €}$$



HP



Efficiency House 40

New Multi-Family House

New Single-Family House

Single-family house energetically well modernised

Average residential building stock

Multi-family house not substantially energetically modernised

Single-family house not substantially energetically modernised



This is a single-family house which was built in 2018. The walls consist of 24 cm thick filled bricks and it is heated with thermal parquet. The floor coverings are parquet and tiles.

**Electricity Consumption**

Values from 25.10.2019 to 03.04.2020:

Electricity consumption of heating and hot water: 4,058 kWh  
 Total electricity consumption: 5,059 kWh  
 Household electricity: 1,800 kWh

Minus :  
 Hot water (heat pump): - 1,000 kWh  
 Electricity consumption heating: 3,058 kWh

Increase by 23 % for the months April to October\*:  
 3,761 kWh

Electricity consumption per square metre and year for 214 m<sup>2</sup> of heated living space:

17.58 kWh/m<sup>2</sup>a

Continuously heated living space: 136 m<sup>2</sup>

Electricity consumption per square metre and year with 136 m<sup>2</sup> of heated living space:

27.65 kWh/m<sup>2</sup>a



"A super luxurious heating system that is very easy to operate. What I like most is the quick heat-up time of about one hour and the small amount of space required, as I don't need a boiler room. Absolutely recommendable."



- Efficiency House 40
- New Multi-Family House
- New Single-Family House
- Single-family house energetically well modernised
- Average residential building stock
- Multi-family house not substantially energetically modernised
- Single-family house not substantially energetically modernised

\*Figures will be further adjusted.

## Comparison of Thermal Parquet with district heating - In the same building

This is a single-family house in St. Michael in Burgenland, which was built around 1900. The walls consist of 40 cm thick bricks without full thermal insulation. There is no cellar, the windows are double glazed and overall the house is poorly insulated. Thermal parquet flooring was used on the ground floor. The remaining floors are heated with district heating.

### District Heating

Time Period:	01.07.2019 until 30.06.2020	
Heated Area:	134,48 m <sup>2</sup>	
Price per kWh District Heating:	0.0957 € (Gross incl. Basic Fee)	
Total Consumption:	23,960 kWh	
Minus Hot Water:	(-2,160 kWh)	21,800 kWh
Consumption per m <sup>2</sup> in one year:	<u>162.11 kWh/m<sup>2</sup>a</u>	
Heating Costs per m <sup>2</sup> :	15.51 €	

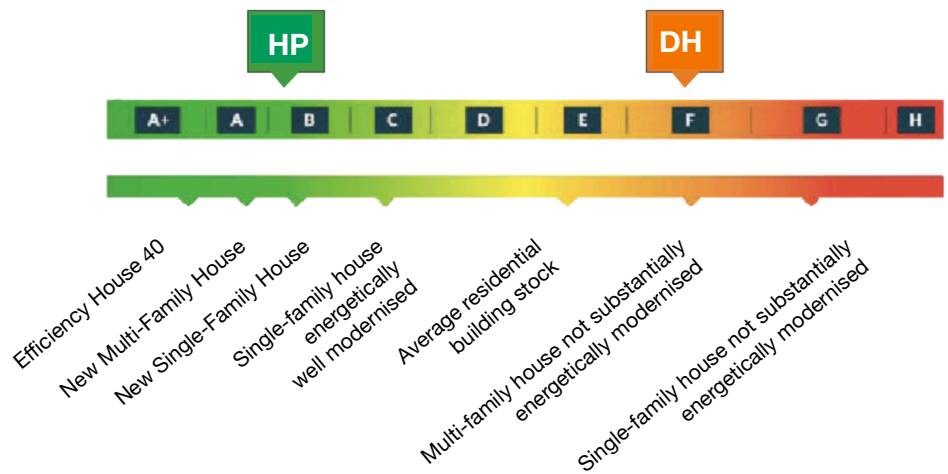
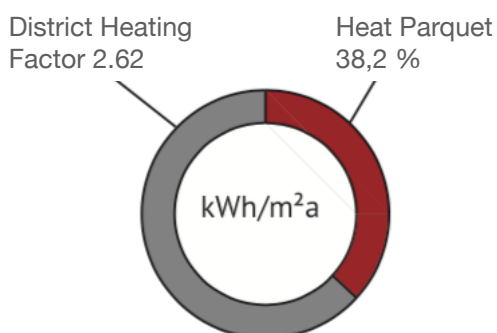


### Heat Parquet

Time Period:	01.07.2019 until 30.06.2020	
Heated Area:	53,15 m <sup>2</sup>	
Price per kWh Electricity:	0,195 €	
Total Consumption:	5,847 kWh	
Minus Hot Water:	(-2,555 kWh)	3,392 kWh
Consumption per m <sup>2</sup> in one year:	<u>61.93 kWh/m<sup>2</sup>a</u>	
Heating Costs per m <sup>2</sup> :	12.08 €	



### Comparison of consumption in kWh per m<sup>2</sup> and year:



IReWA Comfort underfloor heating under tiles was used for this building project near Konstanz. The new building has a well-insulated exposed roof truss with a ceiling height of up to 4.5 m and non-insulated walls with 220 m<sup>2</sup> of heated living area. Hot water is provided by a domestic water heat pump. Wall construction: 36.5 cm vertically perforated brick without full thermal insulation.

### Quick and Clean Installation

The underfloor heating was installed in only **5** days.  
 There were **2** craftsmen on the job.  
 The installation was dust-free and clean.

#### Conventional water-based heating system:

Installation times between **8** and **10** days with 2 craftsmen.

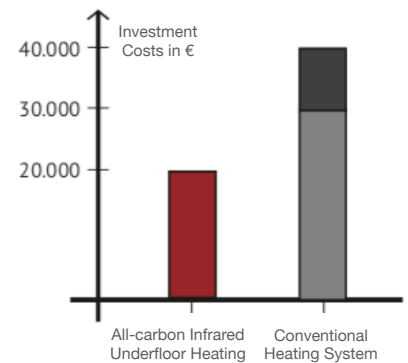
40 - 50 % Time Saving



### Investment Costs

Investment Costs IReWA Comfort Floor Heating:	20,000 €
Various Offers (Air-water heat pump, gas heating, oil heating, pellet heating):	30,000 € - 40,000 €
Without full Thermal Insulation: Savings of approx:	15,000 €

**Total Investment Savings: 25,000 - 35,000 €**



### Consumption Values

Billing Period: 06.10.2018 to 07.10.2019

Total Electricity Consumption:	14,895 kWh
Minus*:	
Domestic Electricity:	- 4,000 kWh
Domestic Hot Water Heat Pump:	- 1,000 kWh
9 kW Sauna:	- 1,000 kWh
<b>Heating Electricity:</b>	<b>8,895 kWh</b>

**Heating Electricity Consumption per m<sup>2</sup> of Living Area p.a.: 40.43 kWh/m<sup>2</sup>a**

