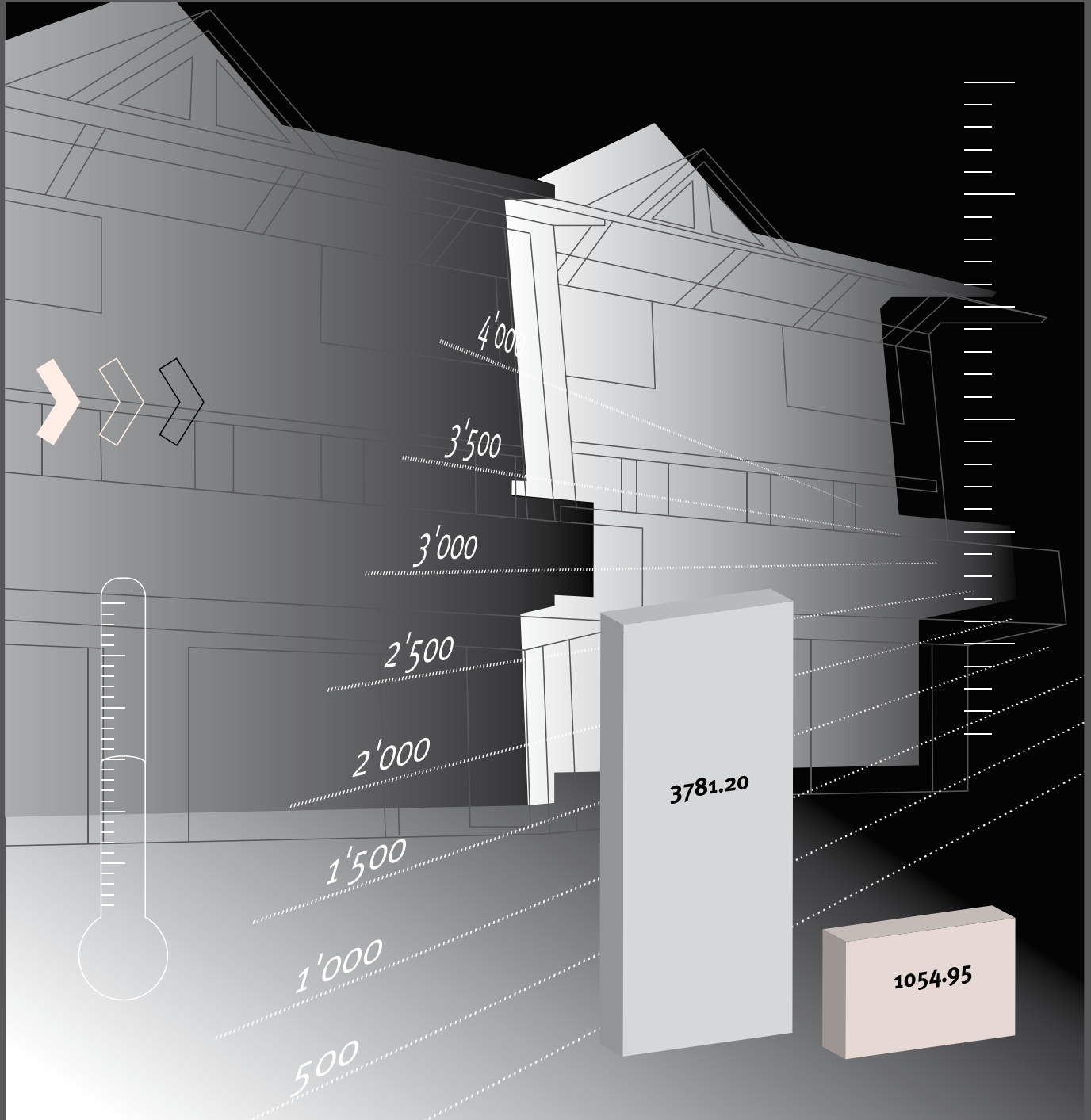


infraSWISS®

SWISSMADE



Evaluation of energy consumption winter 07/08

INITIAL POSITION

Initial Position

A semi-detached family house in Wolhusen was available for the analysis phase, where one side was fitted out. One side of the building was heated with oil, the other with the latest generation of infraSWISS heating. During installation of the infraSWISS heating system, CKW Connex equipped all the infraSWISS heating appliances with separate electric meters. The fabric of the building was identical on both sides of the house and had not been changed since it was built.

The fabric of the building did not meet today's standards by far. Thanks to precise consumption data being available for both halves of the house over several years, not only was the current consumption known, but also the average over the period. The heating performance of the half of the house that had been equipped with infraSWISS remained the same, as these tenants had already been living there for some years. The hot water in both housing units was heated separately using electricity. The following is a comparison of both halves of the house as regards energy consumption.

Description of property

Location	Burghalde 35 and 37, 6110 Wolhusen	Inside wall	Paneling, 24 mm battens, Flamex, 100 mm insulation
Year of construction	1987 semi-detached family house	Outside roof	Clay tiles, 24 mm battens, 50 mm counter battens, 4 mm Pafarok, 160 mm timber construction
Basement	Concreted, basement ceiling with 40 mm insulation	Inside roof	Paneling, 24 mm battens, Flamex, 100 mm insulation
Outside wall	Scored, rendered, 40 mm Perfekt-aplatte, 19 mm chip board, 120 mm timber construction	Window	Glass, insulation U-value 1.8

Burghalde 35

Oil fired burner	Minox IV Modul Therm Type 3.0 – 5–7 kgh Efficiency approx. 95% according to manufacturer Oil fired burner renewed 04.11.1994
Tank	6000 liters of water tank (without domestic hot water tank)
Control	Heating control with external sensors Ground floor with under floor heating system Upper floor and attic with radiators fitted with Danfos valves

Burghalde 37

Electrical infrared heating	infraSWISS low energy design heating appliance – 11 units, total power input 5.8 kW
Control	Siemens Synco-living control with individual room sensors



ENERGY CONSUMPTION

Period of measurement: 1.10.2007 to 30.4.2008 (7 months)
 Number of days measured: 213

Burghalde 35

Energy consumption – oil
 (excluding the current consumption of the oil burner)

Liter: 2'760
 kWh per liter fuel oil: 9.9
 Total heat output kWh: 27'324

Liter oil	Factor *	Total kWh
2'760	9.9	27'324

* 1 liter of fuel oil produces 9.9 kWh of energy

Burghalde 37

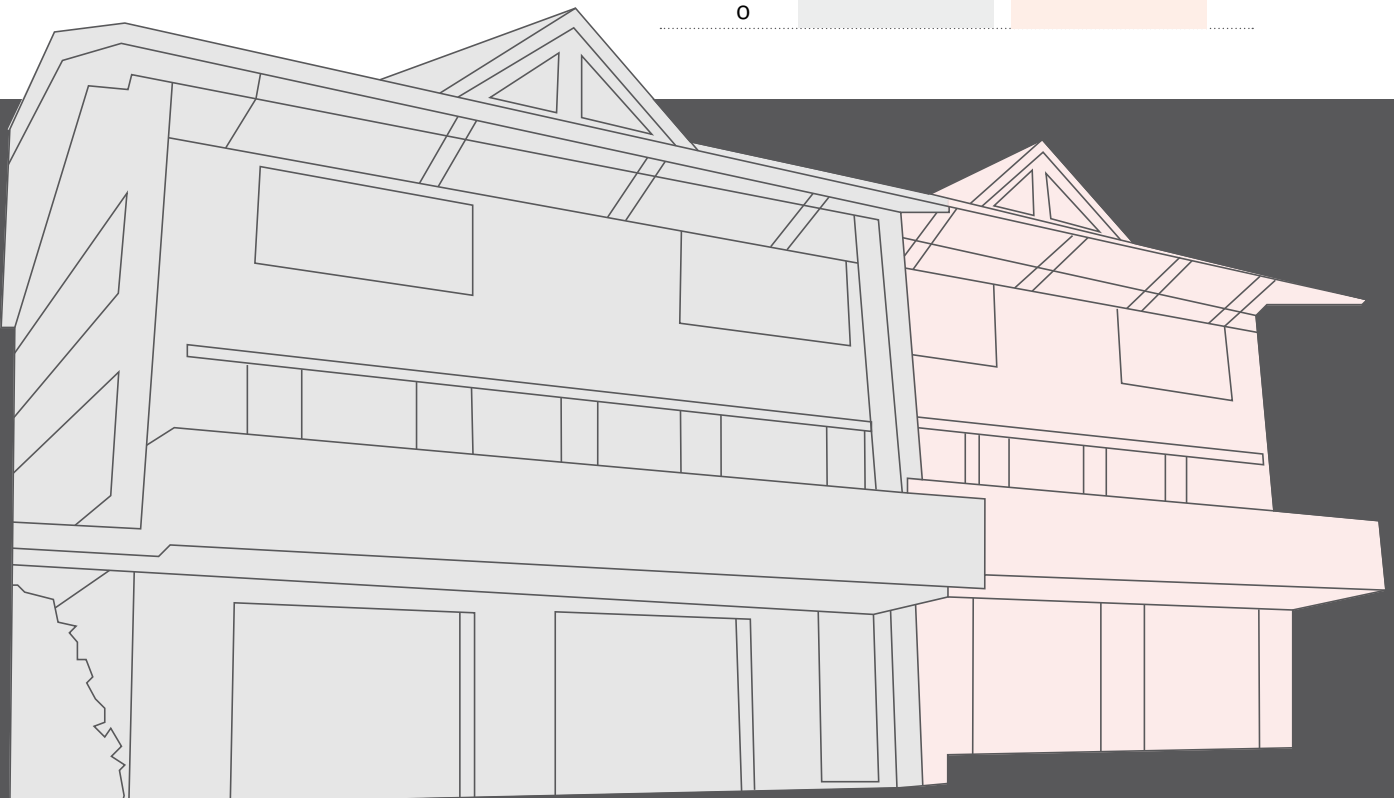
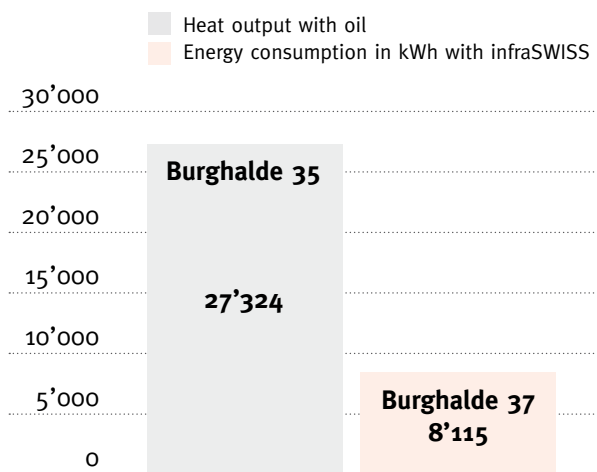
Energy consumption infraSWISS

Installed heat output: 5.8 kW
 Hours of heating: 1'399.14 h

NT low tariff (%): 2'346 (28.9)
 HT high tariff (%): 5'769 (71.1)
 Total heat output kWh: 8'115
 Average running time of heating: 6.57 h/day

Effective power supply kWh

8'115



Conclusion

The period of measurement for both parts of the house was absolutely identical. Despite the fabric of the building having a relatively poor energy index, heat produced the modern way by infraSWISS needs very little energy.

The oil heating used 2760 liters of fuel oil, equivalent to 27324 kWh. In the same period of measurement, infraSWISS heating needed 8115 kWh. The evaluation of the effective consumption numbers proves that the latest generation of infraSWISS gives a performance figure of 3.37, in a direct comparison.

Heat output in kWh with oil	27'324	Factor
Heat output in kWh with infraSWISS	8'115	3.37

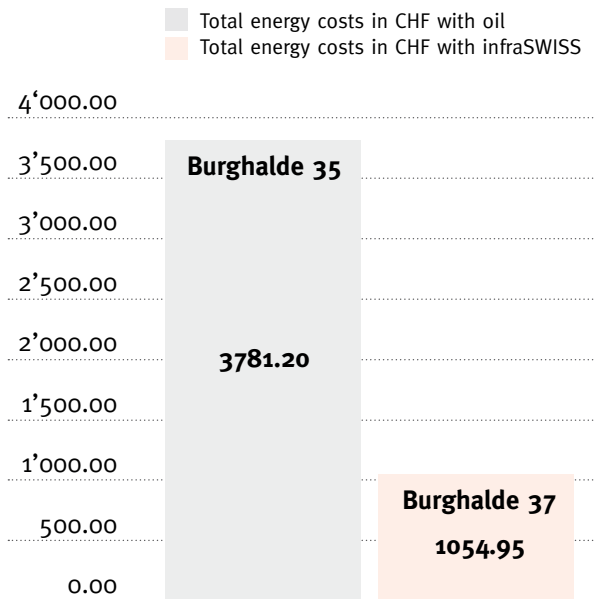
The energy used by infraSWISS heating is 3.37 times less than with oil, and more effective by this factor. In a separate evaluation of the oil consumption in the years 2004, 2005 and 2006, when both parts of the house were still operating with oil heating, one half of the house required on average 2395 liters. The average value of these 3 years still results in a performance figure of 2.92 with infraSWISS for the heating. The calculation looks like this:

Heat output in kWh with oil	23'718	Factor
Heat output in kWh with infraSWISS	8'115	2.92

In a comparison with other heating systems, infraSWISS is, for example, similar to the performance figures of a heat pump (air/water). If grey energy (production/installation) and the fact that infraSWISS equipment needs no maintenance are taken into account, infraSWISS can be seen to be one of the most efficient and most economical heating systems.



HARD FACTS



Result

Electricity would have to cost more than three times as much as it does today for similar results to be obtained with oil. In addition, neither the maintenance costs of oil heating were considered, nor the shorter operational life.

Comfort

The tenants stated that the response time of the heating was much better. At the same time they noticed a significant improvement in air quality.



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