



## Modern house with minimal energy consumption



Oil heaters and radiators are gone - now the Skåren family in Rakkestad gets all its heat from the floor, where the water-borne heat circulates with a base temperature of around 30 degrees. It gives plenty of appropriate heat in all rooms through the winter.

### Old system is gone

The farmhouse of Else and Kjetil Skåren in Rakkestad was built in 1980, according to best principles back then. Which means that there is ten centimetres of insulation in the walls, two-layer windows - and a large oil heater in the basement. Now that is thrown out - in favour of a Thermia ground source heat pump. Before the family took over the home from Kjetil Skåren's parents just over a year ago, a thought process began. *"Oil heating with radiators is yesterday's technology. Dad gave me a clear message when he handed me the keys: It must end."*

### Preparation was most important

The married couple had several questions for both local professionals and Thermia. Finally, the family decided on the combination of geothermal heating and low temperature pipes in the floor. The entire area of the house now has such heating. It is supplied by a rock heat pump in what has now become an overly large heating room. The model is Thermia Diplomat Duo Optimum with separate water heater. The equipment provides both underfloor heating and hot tap water. *"We are happy with both the equipment, products and technical help on phone from Thermia. We also received good advice on magnetite filters and about well depths,"* Skåren says.



Kjetil Skåren and installer in heating room

### Bonus for the small and big

The floorboards for the water-borne heat requires only 23 millimetres extra height below the parquet floor. There is plenty of space here. The conditions of the youngest kid Kristian, who is two and a half years old, clearly explain the change: He can now play by himself, if necessary, just in diapers, on the floor in every room. It's not possible to freeze here. The water below circulates with a temperature on around 30 degrees.

### Simple and clear

Now they can easily monitor and control the room temperature while on work, via an app on the mobile. On the PC they can even

have a more thoroughly read on the energy consumption. If they choose to go to the cabin, they can lower the temperature while they are gone. Then they change it back to normal temperature before they travel home.

### Now the fireplace is just for the cosiness

Kjetil Skåren look at the beautiful fireplace at the kitchen and say: "In addition to the oil heating they usually have had to use more than ten pallets of wood every winter. I believe that from now on we are going to use much less wood. Now we only fire it up for the cosiness. We already have the indoor climate we need. Of course, we believe and

hope that we will have much lower energy costs than before - but the answer to how much we save we'll not get until 2018 is over. The savings themselves is not the most important factor. The relief in everyday life is most important."

### Full overview

Only a few radiators are left on the second floor. The rest of the heat in the house comes from the water that circulates under the new, bright parquet. A shallow and clear cabinet in the basement door hides the piping for the floor heating. In the heating room, the pipes that comes in and goes out have their own thermometer, marked with a marker. In reality, all energy usage is measured and logged continuously and accurately. You just have to open the computer and check.

### Fact Box

**Detached house:**

Wooden house built in 1980

**Living space:** 200 m<sup>2</sup>, plus basement

**Location:** Rakkestad, Norway

**Occupants:**

2 adults and 1 child

**Heat source:**

Geothermal heat

**Heat pump:**

Thermia Diplomat Optimum Duo

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