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DEVI 
by Danfoss

The Ultimate Homeowner's Guide to Electric Underfloor Heating

How to choose the most comfortable, efficient and
future-ready heating system for your home

DEVI GUIDE



Why This Guide Matters

Cold floors are one of the most common comfort problems in modern homes.

Most homeowners only realise the limitations of traditional heating systems after the first winter in their new or renovated home. Cold tiles. Uneven room temperatures. Radiators taking up valuable wall space. These are not minor inconveniences – they are design failures that affect daily life.

Electric underfloor heating solves these problems by turning the entire floor into a gentle, uniform heat source. Rather than blasting warm air from a single point on the wall, the heat rises naturally and evenly from below, creating a noticeably different quality of warmth throughout the room.

This guide will help you make an informed decision about whether electric floor heating is right for your home, your budget, and your renovation plans.



How it works

Understand the technology behind electric floor heating

Where it helps most

Discover the rooms where it makes the biggest difference

What it costs

Real figures for installation and running costs

How to choose

Avoid common mistakes and select the right system

Why Traditional Heating Often Fails Homeowners

Most homes today still rely on heating systems designed **over 70 years ago**. Radiators were a genuine technological step forward when they were introduced, but they were never designed with modern open-plan living, minimalist interiors, or energy efficiency in mind. They heat the air near the walls, that warm air rises to the ceiling, and the floor – the surface you actually live on – remains cold.

This fundamental flaw in how radiators distribute heat creates real, everyday discomfort. The warmth never quite reaches the places where people sit, stand, or play. You turn up the thermostat, the ceiling gets warmer, the energy bill rises, and the floor stays cold. It is a cycle that many homeowners accept as simply inevitable – but it is not.



1 – Uneven Temperature Distribution

Warm air accumulates near the ceiling instead of at floor level, where people actually live. The gap between floor and ceiling temperature can be several degrees, yet energy is being consumed throughout.

2 – Cold Floors

Tiles, stone, and laminate surfaces remain cold during winter regardless of how hard the radiator works. The thermal mass of these materials draws heat away from bare feet instantly.

3 – Limited Interior Design

Radiators restrict furniture placement, dictate room layouts, and are notoriously difficult to incorporate into modern, minimal interiors. They are a compromise many homeowners wish they did not have to make.

Modern heating solutions focus on **radiant heat**, which warms the room from the floor upwards. Electric underfloor heating uses **heating cables or mats installed beneath the floor surface and controlled by thermostats**, creating uniform warmth across the entire room without a single visible component.

What Electric Underfloor Heating Actually Feels Like

The Experience

Imagine stepping out of the shower onto a comfortably warm floor. Or walking barefoot across your living room on a cold winter morning without feeling the chill rise through your feet. This is not a luxury – it is simply what good heating feels like when it is designed around how people actually use their homes.

Electric floor heating creates a **gentle radiant warmth** that spreads evenly across the room. Unlike radiators that heat the air unevenly, the floor itself becomes the heat emitter. The result is a stable, consistent temperature that feels natural rather than forced.

What Homeowners Notice Immediately



Warm floors underfoot

Every surface from tiles to laminate feels comfortable, even in midwinter.



Stable room temperature

No hot spots near the radiator and cold corners across the room.



Less air movement and dust

Radiant heat does not rely on circulating air, which benefits those with allergies.



Completely silent operation

No clicking, gurgling, or hissing – the system is entirely invisible and inaudible.



Where Electric Floor Heating Makes the Biggest Difference

Electric floor heating can be installed in nearly every room in a home, and it is compatible with most modern floor coverings including **tiles, laminate, engineered wood, vinyl, and carpet**. However, some spaces benefit more dramatically than others — and understanding this helps you prioritise where to invest first.



Bathrooms

The single most popular application for underfloor heating. Warm tiles after a shower transform the experience completely. As a bonus, heated floors dry faster and reduce ambient humidity, which helps prevent mould and damp.



Living Rooms

Provides uniform comfort across large spaces without any visible heating devices. Furniture can be placed freely, and the entire floor becomes a gentle radiator. Particularly effective in open-plan layouts where traditional radiators struggle to heat evenly.



Children's Rooms

Children spend far more time at floor level than adults. Warm floors make playtime more comfortable, and there are no hot radiator surfaces to worry about. The stable, low-level warmth is also ideal for younger children and babies.



Hallways & Entrances

Often the coldest areas in a home, especially in older properties. A heated hallway creates a genuinely welcoming atmosphere in winter and dries wet floors and boots far more quickly after coming in from outside.

DEVI Comfort Heating: The Supplementary System

Understanding the two main system types is essential before making any purchasing decisions. The first – and most widely installed – is **comfort heating**. This type of system is designed to provide warm, pleasant floor surfaces rather than to heat the entire room to a target temperature on its own.

Comfort heating works alongside an existing central heating system, such as radiators or a heat pump. The underfloor heating takes care of the thermal quality of the floor surface itself, while the primary system manages the overall room temperature. This combination is extremely popular in bathrooms, kitchens, and hallways, where cold floors are the main complaint but whole-room heating is already provided elsewhere in the property.



Typical Applications

- Bathrooms and wet rooms
- Kitchens and utility rooms
- Hallways and entrances
- Any room with an existing heating source

Typical Specification

Comfort heating systems typically operate at around **100 W/m²** of installed power. This is sufficient to bring floor surfaces to a comfortable temperature and maintain them there without any significant impact on the overall room heat.

Installation is quick and non-invasive in most cases, making comfort heating a particularly attractive option for bathroom renovations where disruption needs to be kept to a minimum.

DEVI Total Electric Heating: The Primary System



The second system type – **total electric heating** – is used as the primary heat source for the room. Rather than supplementing an existing system, it replaces it entirely. This approach is increasingly popular in modern energy-efficient homes, apartments, and properties where wet underfloor heating is impractical or cost-prohibitive to install.

Total electric heating requires careful calculation of the room's heat loss before specifying the system. The heating output must be sufficient to overcome the heat escaping through walls, windows, and the floor itself in the coldest outdoor conditions. This is why insulation quality plays such a critical role – a well-insulated room requires significantly less installed power to maintain comfort, which directly reduces running costs.

Living Rooms

Open-plan spaces benefit enormously from the even heat distribution of a total electric system.

Bedrooms

Gentle, consistent warmth without any noise or air movement – ideal for a comfortable night's sleep.

Apartments

No boiler, no pump, no pipework – electric heating simplifies installation considerably in flats.

Energy-Efficient Homes

Well-insulated new builds with low heat loss are ideal candidates for total electric heating as the sole heat source.

ⓘ Typical heating output for total electric systems: 100–200 W/m², depending on the calculated heat loss of the room. A professional heat loss calculation is strongly recommended before specifying any total heating system.

Renovation vs New Construction

DEVI underfloor electric heating systems are particularly well suited to renovation projects – and this is one of the most significant reasons for their growing popularity. Unlike wet underfloor heating, which typically requires significant floor build-up and a complete screed installation, electric systems can be integrated into a renovation with minimal disruption and a very low increase in floor height.

Renovation Projects

DEVI heating mats can be installed directly beneath tile adhesive, adding only a few millimetres to the overall floor height. This makes them ideal for bathroom upgrades, kitchen refurbishments, and hallway renovations where matching door clearances and existing floor levels is essential.

- Minimal floor height increase
- Fast, straightforward installation
- Ideal for bathroom and kitchen upgrades
- Compatible with existing floor construction

New Construction Projects

In new build projects, DEVI heating cables can be embedded directly within the screed layer during construction. This allows for a higher installed power capacity, more uniform heat distribution across the slab, and the potential to use the system as the primary heating source for the entire property.

- Higher heating capacity possible
- Uniform heat distribution through the slab
- Suitable as a primary heating system
- Integrates seamlessly with the build programme

How Much Does Electric Floor Heating Cost to Run?

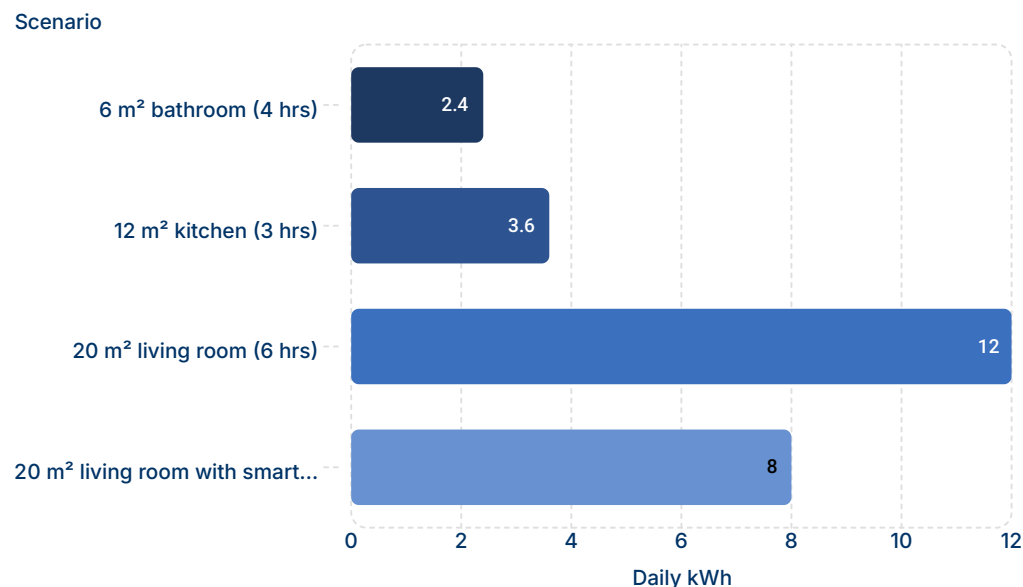
Running costs are one of the first questions homeowners ask – and with good reason. The answer depends on the size of the heated area, the installed power, how many hours per day the system operates, and crucially, how intelligent the thermostat is. Modern smart thermostats have transformed the economics of electric heating by ensuring the system only runs when it genuinely needs to.

A Worked Example

Consider a typical family bathroom of **6 m²** fitted with a comfort heating mat at **100 W/m²**. The total installed power is **600 W** – less than a standard kettle. If the system runs for **4 hours per day**, the daily energy consumption is just **2.4 kWh**.

In practice, actual energy use is often lower than this theoretical maximum. A thermostat with a floor sensor will switch the heating off once the floor reaches its target temperature, and adaptive heating functions will learn the room's thermal behaviour over time, pre-heating only as much as necessary.

i **Smart thermostats can reduce energy consumption by 20–40%** compared to systems running on a simple on/off timer, through scheduling, adaptive start, and occupancy detection.



Indicative daily energy consumption across typical room sizes and usage patterns. Smart thermostat savings illustrated for the living room scenario.

5 Mistakes Homeowners Should Avoid

Many of the heating problems homeowners experience after installation are entirely avoidable. They nearly always stem from decisions made during the planning phase – before a single cable has been laid. Understanding these common errors in advance is the most effective way to ensure your system performs exactly as expected from day one.

1

Installing Without Insulation

Without adequate floor insulation beneath the heating element, a significant proportion of generated heat escapes downwards rather than warming the room above. Insulation boards are an essential part of any efficient installation, particularly on ground floors and over unheated spaces.

2

Specifying Incorrect Heating Power

Too little installed power means the system will struggle to reach or maintain the target temperature in cold weather. The correct output should be calculated based on the room's actual heat loss, not simply estimated. A professional calculation takes only minutes and can save years of disappointment.

3

Omitting a Floor Sensor

Floor temperature sensors protect floor coverings from overheating and allow the thermostat to control output precisely. Without one, the system relies solely on air temperature – which responds more slowly and less accurately to actual floor conditions.

4

Poor Thermostat Placement

A thermostat positioned near a window, in a draught, or in direct sunlight will give inaccurate readings and cause the system to behave erratically. Thermostats should be mounted at a standard height on an internal wall, away from any external influence on the sensor.

5

Choosing the Wrong System Type

Selecting a comfort heating system in a room that requires total heating – or vice versa – is a fundamental error that cannot easily be corrected after installation. Matching the system type to the room's actual heat demand is the single most important planning decision you will make.

What Makes DEVI Electric Heating Reliable

Electric heating systems have a fundamentally different reliability profile from wet central heating systems. There are **no moving parts** – no pumps, no valves, no expansion vessels, no circulating water. Every component that can wear out, corrode, leak, or fail over time in a traditional wet system simply does not exist in an electric one.

This simplicity translates directly into long-term reliability. Modern heating cables are manufactured to withstand continuous thermal cycling – expanding and contracting with every heating cycle – over a service life measured not in years but in decades. The cables themselves are embedded within the floor structure and, once installed correctly, require no maintenance whatsoever.

Homeowners who invest in electric underfloor heating are not just buying a product – they are installing an infrastructure that is expected to outlast multiple bathroom renovations, several rounds of redecorating, and quite possibly the next generation of occupants in the property.

20

Year Warranty

Typical manufacturer warranty on quality heating cables

50+

Year Lifespan

Expected cable lifetime when correctly installed



Smart Thermostats DEVIreg™ and Energy Efficiency

The thermostat is arguably the most important component in any electric heating system – not because it generates heat, but because it controls precisely when and how much heat is generated. A high-quality smart thermostat can transform a good heating system into an excellent one, delivering measurably better comfort alongside meaningfully lower running costs.

Modern DEVIreg™ thermostats are sophisticated devices that go far beyond the simple on/off timers of previous generations. They learn the thermal behaviour of individual rooms over time, adjusting their start times automatically to ensure the floor reaches the target temperature at exactly the right moment – without wasting energy heating an empty room earlier than necessary.



Programmable Schedules

Set heating times for each day of the week, matching your routine precisely. The system heats when you need it and switches off automatically when you do not.



Dual Sensors

Floor and room temperature sensors work together to maintain both surface comfort and ambient warmth, protecting floor coverings from overheating.



Adaptive Start

The thermostat learns how long the floor takes to reach the target temperature and starts heating automatically in advance, so it is always ready when you need it.



Remote Control

Adjust settings, check energy use, and override schedules from anywhere via a smartphone app – ideal for irregular routines or holiday returns.

Why Homeowners Choose DEVI



DEVI is one of Europe's leading manufacturers of electric heating systems, with decades of experience across residential, commercial, and infrastructure heating applications.

The brand's reputation is built on a consistent commitment to engineering quality, product reliability, and intelligent thermal design – values that matter enormously when you are selecting a system intended to last for the lifetime of your home.

DEVI systems are specified and installed by professionals across the world, from individual bathroom renovations in private homes to large-scale infrastructure projects including football stadiums, airport aprons, and bridge decks. This breadth of application is a testament to the fundamental reliability of the underlying technology.

Engineering Quality

High-quality heating cables manufactured to exacting standards, with consistent performance across the full service life of the product.

Smart Technology

A comprehensive range of thermostats from simple programmable models to fully connected smart devices with smartphone control and energy monitoring.

Long Warranties

Market-leading warranty periods that reflect genuine confidence in product longevity. DEVI backs its products with warranties of up to 20 years.

Global Proven Performance

Installed in homes, apartments, stadiums, and infrastructure projects across the globe – a truly proven system at every scale.

Your Next Step

Is DEVI Electric Floor Heating Right for Your Home?

Electric floor heating is not the right solution for every situation – but for a very wide range of modern homes and renovation projects, it is the most comfortable, most reliable, and most future-ready heating choice available. The key is matching the right system type to the right application, specifying it correctly, and installing it with care.



Renovating a bathroom or kitchen

A heating mat installed beneath tiles is one of the fastest, least disruptive, and most rewarding home improvements you can make.



Building a new energy-efficient home

In a well-insulated new build, electric underfloor heating can serve as the sole heat source – eliminating boilers, radiators, and pipework entirely.



Seeking an invisible heating solution

If you want complete freedom over your interior design without a single visible heating element, electric underfloor heating is the only logical choice.



Improving comfort without major construction

For targeted improvements – a cold bathroom, a draughty hallway – a comfort heating system can be installed in a single day with minimal disruption.

If you are planning a renovation or building a new home, speak with a professional to determine the best solution for your project.

Visit [devi.co.nz](https://www.devi.co.nz) to learn more or find a local DEVI branch near you.

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