

# Executive Summary

**Introducing the Heat Pump Readiness Indicator:**  
How to make Energy Performance Certificates fit for heat pumps





**The heat pump readiness indicator is a potential tool to safeguard delivery of a consumer-friendly Renovation Wave. It could empower households to play their part in the energy and climate crisis in an affordable and easy way.**

While the concept of heat pump readiness holds significant potential to advance building decarbonisation policies and bring many benefits to EU citizens, its exact definition and the development of a corresponding indicator that is integrated into EPCs, should be further investigated before moving to practical implementation. This is essential if the EU intends to implement the Energy Efficiency First principle in the buildings sector and optimise the roll out its REPowerEU objectives, aligning short- and long-term energy security and climate targets, and ensuring that EU citizens take hold of all the potential benefits of relevant depth of renovation.

Heat pumps may have a crucial role in the decarbonisation of the building stock in the EU, the uptake of renewable heating and the reduction of our dependency on fossil fuel imports for heating. Heat pumps can support EU decarbonisation efforts to phase out fossil fuels and promote low-temperature district heating systems. To realise their full potential, it is important to understand if residential EU buildings, and in particular their building envelopes, are fit for heat pump installation and deployment. Energy performance certificates (EPCs) have an important role in conveying this information, especially to building owners.

For this purpose, this study:

1. Defines an approach to measure the “heat pump readiness” of buildings, tested on 30 target buildings across the EU
2. Assesses how a break in heating supply may affect indoor temperature and comfort period in target buildings
3. Proposes the heat pump readiness indicator (HPRI) and ways to include it in national EPCs, including a list of policy recommendations.
4. Assumes an air-water heat-pump as the reference heat pump, with a space heating capacity of 15 W per m<sup>2</sup> of the building floor area (defined for an outside temperature of 0°C) and supplying hot water at a temperature of 45°C.

The definition of **heat pump readiness (HPR)** is based on the main characteristics of heat pump technology and how it is used in buildings. The HPRI estimates the extent to which a heat pump can use outside air to cover a building’s heating demand, and how this depends on the building envelope and improvements made to it. Heat pump readiness can be assessed relatively easily once the characteristics of the building envelope, climate and the reference heat pump are known. A reference heat pump is introduced to ensure implementation of feasible heat pump solutions, clear comparison of results, and analysis highly relevant for all stakeholders.

Building insulation and the climate zone have a significant impact on a building's heat pump readiness. The better the insulation and/or warmer the climate, the higher the possible heat pump readiness. Therefore, building renovation that includes the installation of a low temperature heat distribution system can significantly increase heat pump readiness of buildings, but only up to the point when maximum share of heating energy extracted from air is reached. Hence, the importance of adequate insulation.

**The share of a building's heating demand covered by electricity also increases its heat pump readiness. The decarbonisation potential of heat pumps therefore depends heavily on efforts to decarbonise the electricity supply.**

Figure 1: Building heat load coverage by heat pump, electricity and backup systems

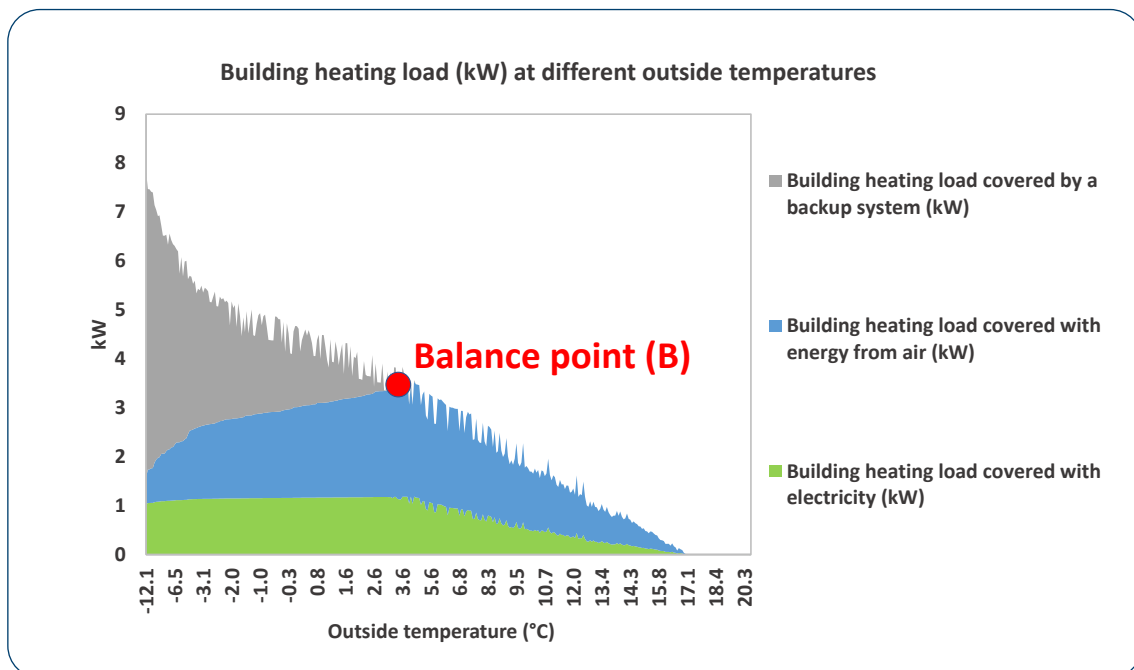
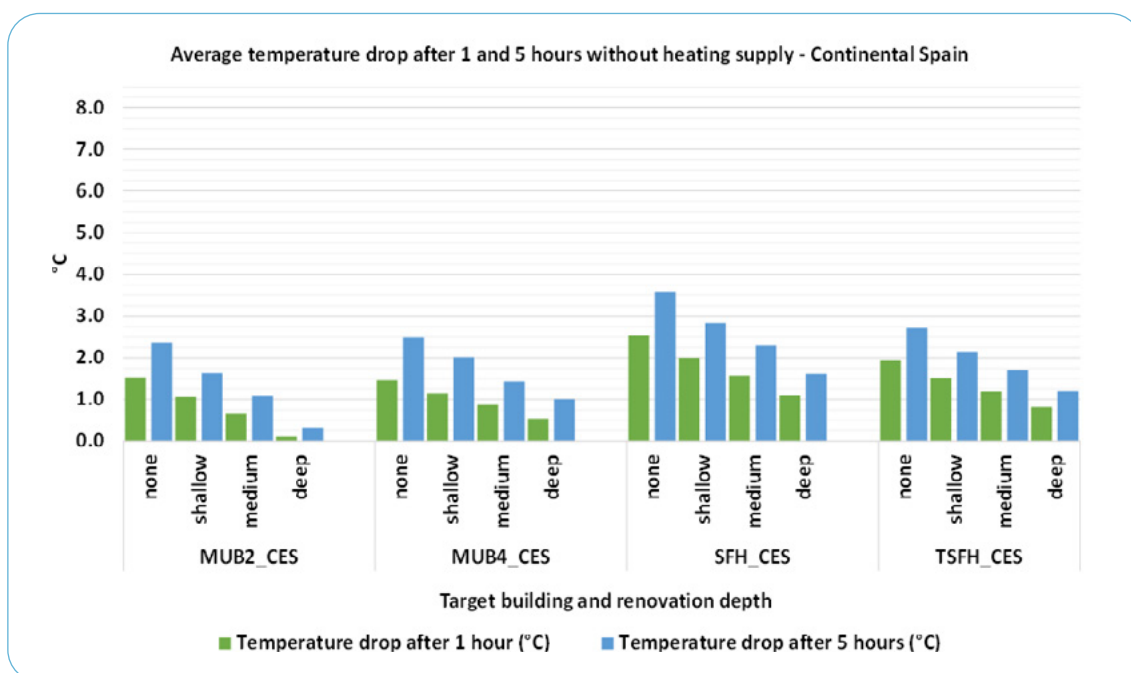


Figure 1 demonstrates that at temperatures below the balance point, the heat pump capacity is not enough to cover the entire building heating load. In this case, a backup heating system such as a gas boiler is needed to cover the difference.

Figure 2: Temperature drops after heating is switched off for non-renovated and renovated buildings (Continental Spain)



Although heat pump readiness may be highly relevant for making decisions on building envelope renovation and heat pump investments, it will have little value unless it is properly communicated. EPCs can be an important tool to pass this information to building owners and other stakeholders.

**Our review of 11 EPC schemes across the EU showed that although many capture significant information on heat pumps, they do not clearly show if the building is heat pump ready.** To help inform homeowners about the benefits of heat pumps, this study proposes to include the heat pump readiness indicator in EPCs. This inclusion would provide a common methodology to assess the capacity of a building to use heat pump technologies and adapt its operation to the needs of the occupants and the grid while improving energy efficiency. Including the HPRI in EPCs would be an effective way to pass on useful information (e.g. financial payback, annual electricity costs, indoor comfort) to consumers.

There are various barriers to developing and deploying the HPRI. This report provides a broad range of policy recommendations to realise its full potential. These include recommendations on assessment and communication, consistency between the HPRI and EPC calculation methodologies, and technical specifications for different building types.



## Key takeaways

- **The heat pump readiness of a building is defined as the share of a building's annual space heating demand that can be covered by energy extracted from outside air using a reference heat pump.**
- **Building renovation can improve the energy efficiency of the building envelope**, and by installing low-temperature heat distribution systems, can help improve the heat pump readiness of target buildings.
- **Deep renovation would in most cases eliminate the need for a backup system**, allowing the reference heat pump to completely cover heating demand.
- **Renovated buildings will have a longer comfort period after the heating cut-off.** Deep renovation can significantly reduce temperature drops when the heating supply is cut off, keeping buildings comfortable for a longer period.
- **National EPCs do not explain heat pump readiness**, although they may capture information on heat pumps.
- **HPRI should be included as a label on a building's EPC**, allowing owners/occupants to easily assess and understand the imminent and future potential of a heat pump, and helping to communicate other potential benefits.
- **The energy that heat pumps can obtain from certain sources, such as outside air, is still not classified as renewable in some national EPC schemes.** To ensure consistency, such energy sources should be classified in the same way across the EU.
- **Introducing the HPRI to EPC schemes should not require additional data collection efforts.** Existing EPC schemes contain most of the data required for assessing a building's heat pump readiness.
- **Installation of heat pumps triggered by the HPRI will increase buildings' demand response and comfort, and could increase the renewable capacity of the energy grid.**
- **An HPRI assessment will enhance the quality of EPCs.** Adding a HPRI will make EPCs more accurate through reliable data.
- Despite the barriers to adding the HPRI to EPC schemes, **EPCs are important tools to evaluate and easily communicate** a building's heat pump readiness.
- Depending on the climate zone and the building type, **a medium range retrofit may be sufficient** to allow the reference heat pump to completely cover heating demand and reduce temperature drops sufficiently to keep buildings comfortable enough.



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