What is the Coefficient of Performance (CoP)?

The Coefficient of Performance (CoP) is a metric used to evaluate the efficiency of a heat pump or refrigeration system. It is defined as the ratio of useful heating or cooling energy delivered by the system to the electrical energy consumed to achieve that output. A higher CoP indicates greater efficiency.

In the UK house building, residential retrofit, home renovation, and extension sectors, CoP is a critical measure for assessing the performance of heat pumps, which are increasingly used to meet energy efficiency and carbon reduction targets. It is particularly relevant in the context of Building Regulations Part L (Conservation of Fuel and Power) and the UK government's push towards low-carbon heating solutions.

Practical Example:
A heat pump with a CoP of 3.5 delivers 3.5 units of heat energy for every 1 unit of electricity consumed. For instance, if a heat pump uses 2 kWh of electricity to produce 7 kWh of heat, its CoP is 3.5. This makes it a highly efficient heating solution compared to traditional gas boilers.

Synonyms:

- Efficiency Ratio
- Energy Performance Ratio

Related Terms:

1. **Seasonal Coefficient of Performance (SCOP):** Measures the average efficiency of a heat pump over an entire heating season, accounting for varying temperatures.
2. **Energy Efficiency Ratio (EER):** Used specifically for cooling systems, it measures the cooling output divided by the electrical input.
3. **Building Regulations Part L:** UK regulations that set standards for energy efficiency in buildings, including the use of heat pumps.
4. **Heat Pump:** A device that transfers heat from a lower temperature source to a higher temperature space, often used for heating or cooling buildings.
5. **Renewable Heat Incentive (RHI):** A UK government scheme that provides financial incentives for the installation of renewable heating technologies, including heat pumps.
6. **Approved Document L1B:** Provides guidance on meeting energy efficiency requirements for existing dwellings, including the use of heat pumps.
7. **Carbon Emissions:** The release of carbon dioxide into the atmosphere, which heat pumps help reduce by replacing fossil fuel-based heating systems.