

Monthly Heating and Cooling Degree Days

Heating Degree Day (HDD) is a weather-based technical index designed to estimate the heating energy requirement of buildings. HDD is derived from meteorological measurements of air temperature.

The calculation of HDD relies on the base temperature, defined as the lowest daily mean air temperature not leading to indoor heating. The value of the base temperature depends in principle on several factors associated with the building and the surrounding environment. By using a general climatological approach, the base temperature is set to a constant value of 15°C in the HDD calculation:

$$\text{If } T_{mean}^i \leq 15^{\circ}\text{C then } HDD = \sum_i (18 - T_{mean}^i) \text{ else } HDD = 0$$

where T_{mean}^i is the daily mean air temperature of the i^{th} day.

Cooling Degree Day (CDD) is a climatological index describing the amount of energy required for indoor cooling (air-conditioning). The base temperature for CDD is set to 24°C. CDD is derived by using the following equation:

$$\text{If } T_{mean}^i \geq 24^{\circ}\text{C then } CDD = \sum_i (T_{mean}^i - 21) \text{ else } CDD = 0$$

where T_{mean}^i is the daily mean air temperature of the i^{th} day.

The **long-term average (LTA) of the HDD** data, as published in the AGRI4CAST portal, is calculated from the long-term average daily air temperature:

$$\text{If } T_{LTA}^i \leq 15^{\circ}\text{C then } HDD = \sum_i (18 - T_{LTA}^i) \text{ else } HDD = 0$$

where T_{LTA}^i is the long-term average daily mean air temperature of the i^{th} day.

The **long-term average (LTA) of the CDD** data is correspondingly calculated from the long-term average daily air temperature:

$$\text{If } T_{LTA}^i \geq 24^{\circ}\text{C then } CDD = \sum_i (T_{LTA}^i - 21) \text{ else } CDD = 0$$

where T_{LTA}^i is the long-term average daily mean air temperature of the i^{th} day.

The **monthly** HDD and CDD data provided in the AGRI4CAST portal are monthly sums of the daily calculated HDD and CDD values.