

Why

Hydroponics requires large quantities of water. There are increasing numbers of dry spells, and the intensification of the horticultural sector is also leading to a growing demand for high-quality irrigation water. We are investigating whether condensate from a combined heat and power (CHP) plant can be used as a supplementary water source alongside rainwater in hydroponics.

What

Condensate from the CHP plant may contain (heavy) metals and mineral oil. To ensure the water source can be used safely, the condensate can be treated using the treatment unit from Lubron Water Technologies.

How

Construction

The condensate from the CHP unit is first drawn in from the grease trap and passes through a candle filter to remove larger particles. The water then passes through an activated carbon filter, which absorbs the mineral oils. Finally, the water passes through a resin filter to remove (heavy) metals. Once purified, the water can be used for irrigation in crop production.

Cost

Target price

The cost of installation is around € 20,000–€ 22,000 for a unit that purifies 2.5 m³/hour. In addition, operational costs must also be taken into account, which mainly consist of electricity (approximately € 150 per year) and maintenance costs (approximately € 1,420 per service, including replacement of all filters). Maintenance of the unit, possibly including filter replacement, may be required once or twice a year, depending on the amount of metals and mineral oil present in the condensate.

Benefits

Economic

CHP condensate can account for around 10% of total irrigation water on an annual basis. It is estimated that 600–750 m³/ha/year could be collected. The amount of condensate produced by the plant depends heavily on the number of operating hours and the capacity of the CHP unit. If water shortages need to be topped up with mains water, the cost of mains water must be taken into account, which amounts to 2.2 EUR/m³ (PIDPA, 2025).

What to look out for

Legislation

It is important that the filters in the treatment plant are checked regularly. The particle filter, the activated carbon filter and the resins can become saturated, which means the water is no longer treated effectively. High levels of metals in untreated condensate can lead to the accumulation of elements such as lead and nickel in the fruit above the MRL (EU Regulation 2023/915).

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