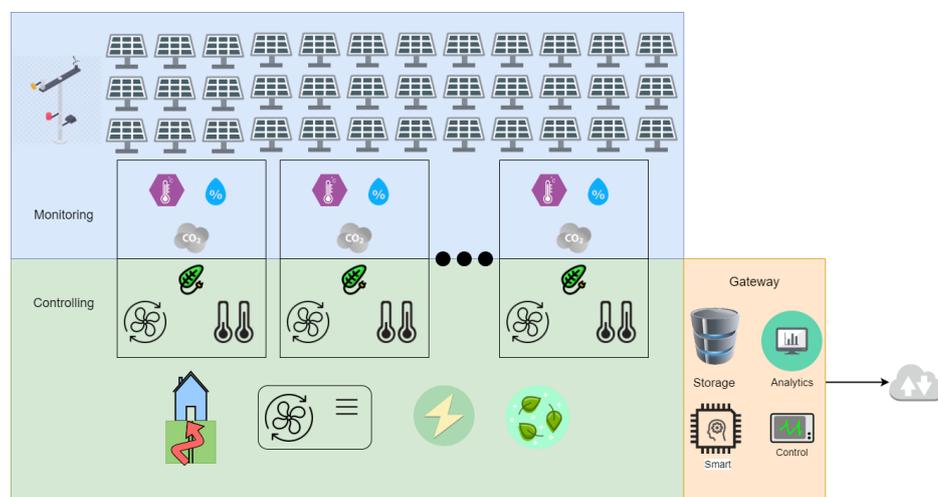




Precise indoor environmental control of agricultural buildings and energy smart control

Agriculture 4.0 is the new approach towards farm management and precision agriculture. The ability to harness the technology advancements from other industries, such as IoT (Internet of Things), computer science etc., allowed agricultural sector to evaluate and adopt them to achieve energy efficiency and optimal indoor conditions for the livestock. Agriculture 4.0 is combining low-cost sensors and actuators, with cloud computing and artificial intelligence (AI) to achieve its goals and help farmers make better decisions, while at the same time reducing their environmental footprint¹.

Utilizing farmer-defined scenarios that consider specific livestock requirements, the areas occupancy and other characteristics, the IoT system is enabling smart control towards heating, cooling and ventilation and optimize the microclimate, in terms of indoor air quality and thermal environment.



To allow the smart control system to take the wheel and operate automatically, the farms utilize smart sensors to monitor the different environmental parameters, such as temperature, relative humidity, wind speed and direction, hazardous gases (CO₂, NH₃, H₂, O₂, VOC), as well

as energy consumption data. Moreover, the system can collect baseline data² to evaluate, assess and compare “Before” and “After” conditions.

Precise indoor environmental and energy smart control are integral parts of the RES4LIVE implementation. The data will be available to the users in real-time, through a cloud platform, which will:

- allow remote monitoring;
- provide useful analytics, and;
- perform actual control of the connected devices.

The above-mentioned features will assist in both everyday operations and long-term farm management.

¹ Almalki, F.A.; Soufiene, B.O.; Alsamhi, S.H.; Sakli, H. A Low-Cost Platform for Environmental Smart Farming Monitoring System Based on IoT and UAVs. *Sustainability* 2021, 13, 5908. <https://doi.org/10.3390/su13115908>

² Baseline data provides the historical point of reference for the next steps of project monitoring and evaluation.

