

CSP AND DESALINATION

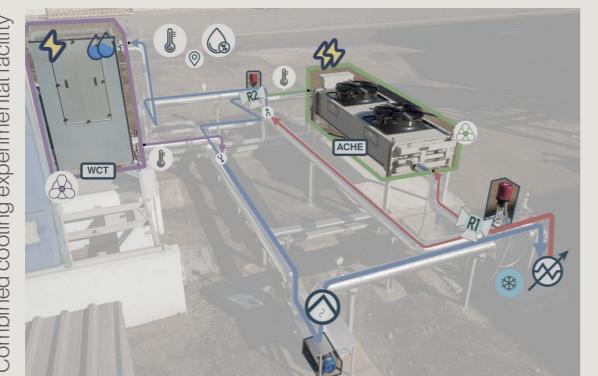
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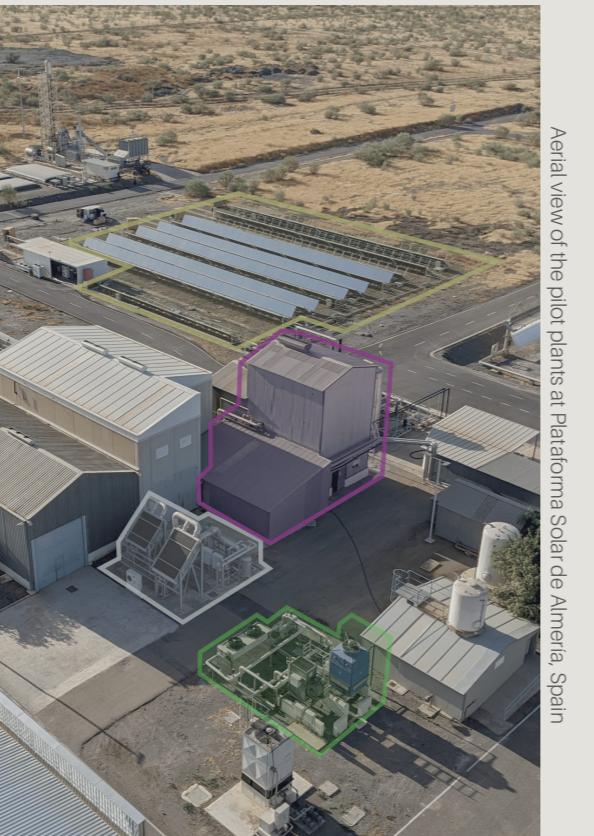
Two linked resources Water and Energy

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KEY COMPONENTS OF THIS RESEARCH WORK

Objective: Automation seeks to develop autonomous systems by integrating modelling, control, and optimization, enabling efficient resource use, adaptability to changing conditions, and reliable operation with minimal human intervention. This work optimizes the operation of two solar thermal systems by solving economic optimization problems that minimize operational costs and, by its integration to the analyzed processes, allows them to achieve near-optimal autonomous performance.



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A hierarchical optimization strategy is developed to coordinate the activation, deactivation, and regulation of each subsystem in the SolarMED process, leveraging solar availability and the flexibility of thermal energy storage. In a week-long simulation, the proposed strategy outperforms a heuristic baseline by 32%.

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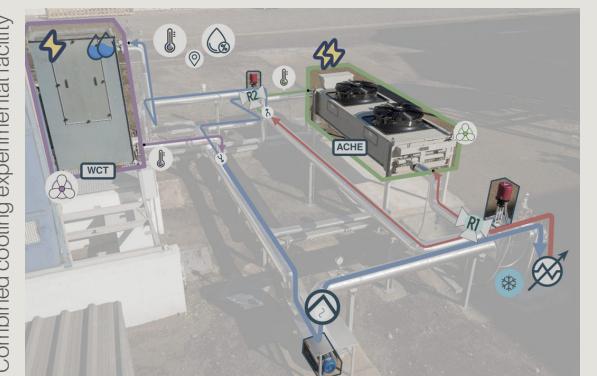
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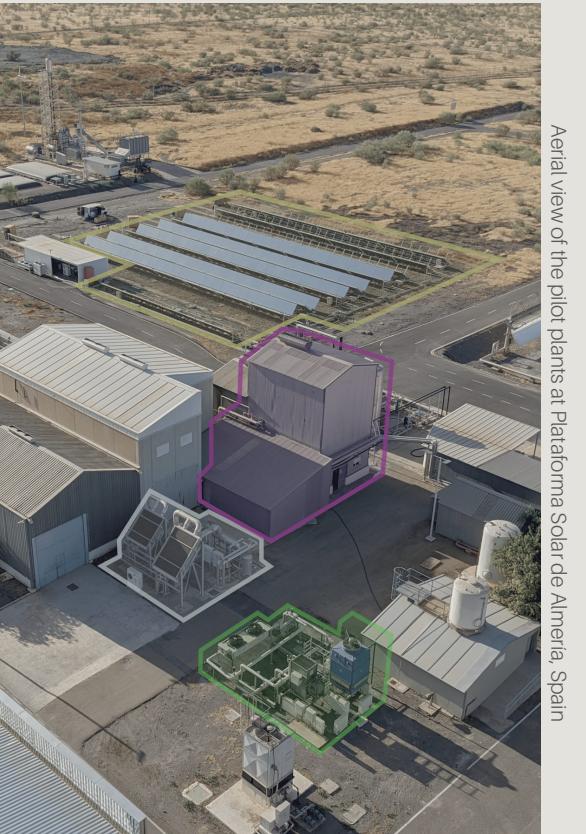
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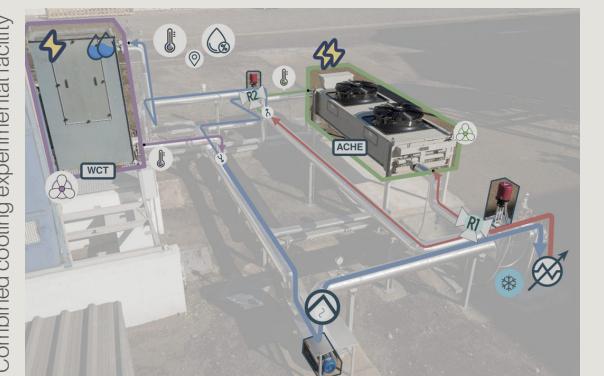
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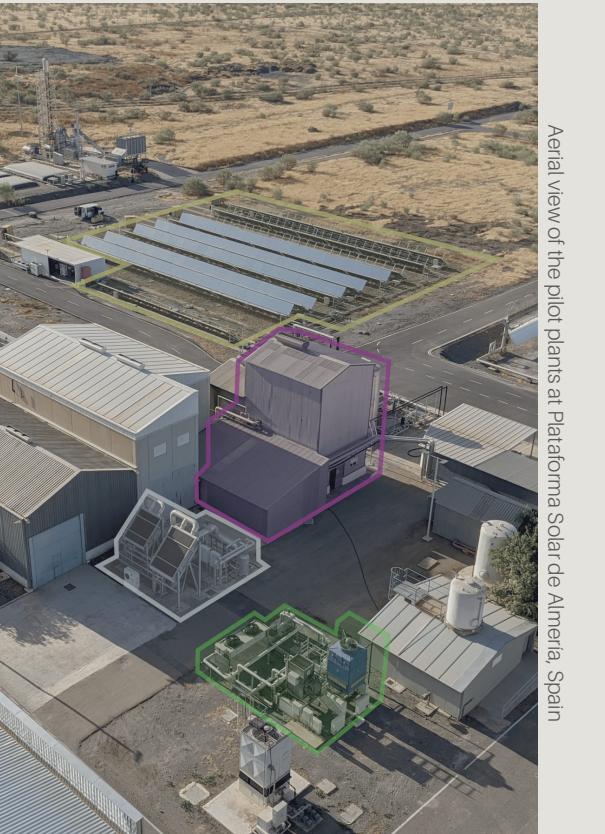
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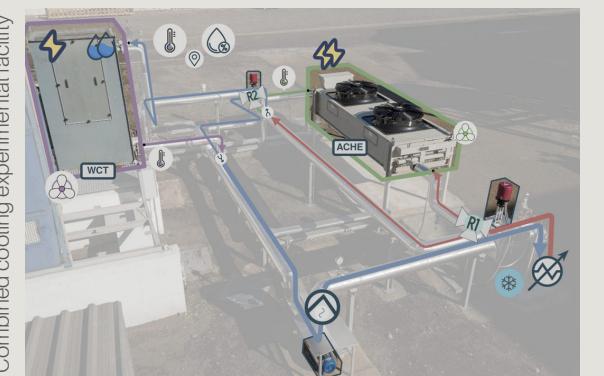
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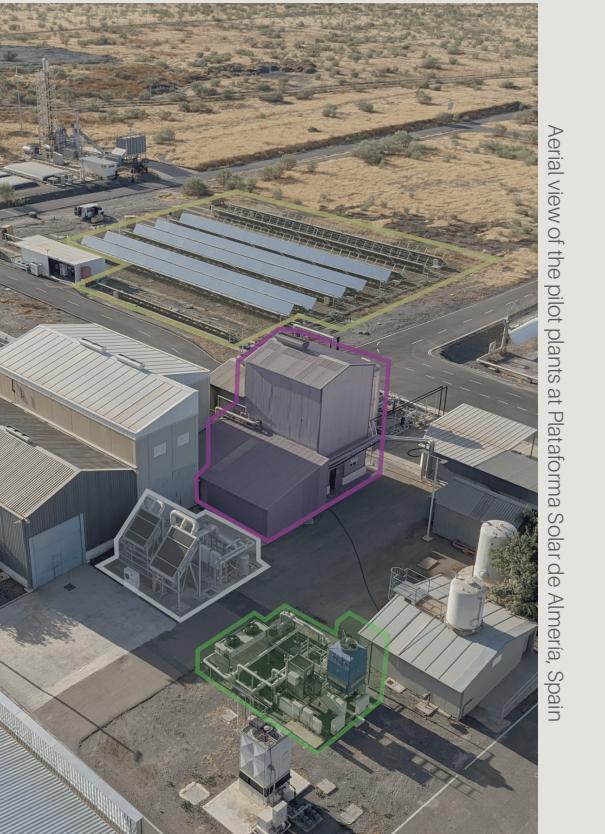
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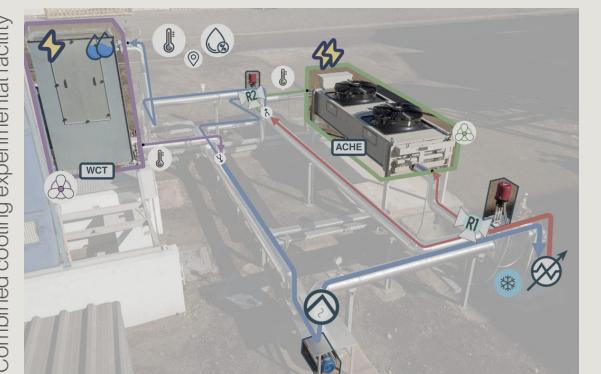
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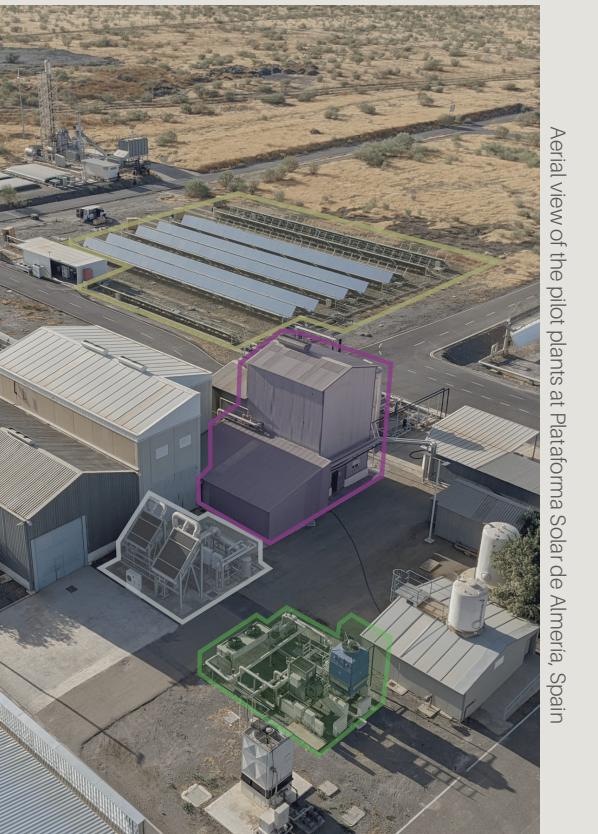
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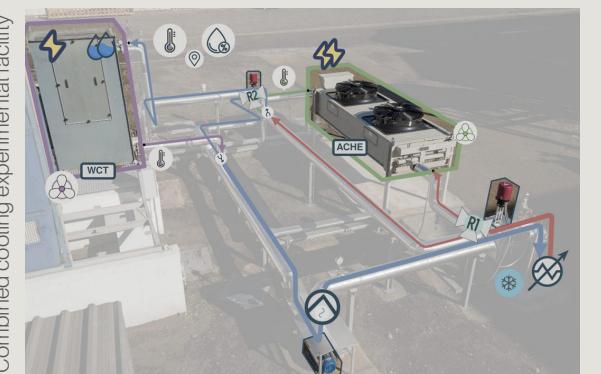
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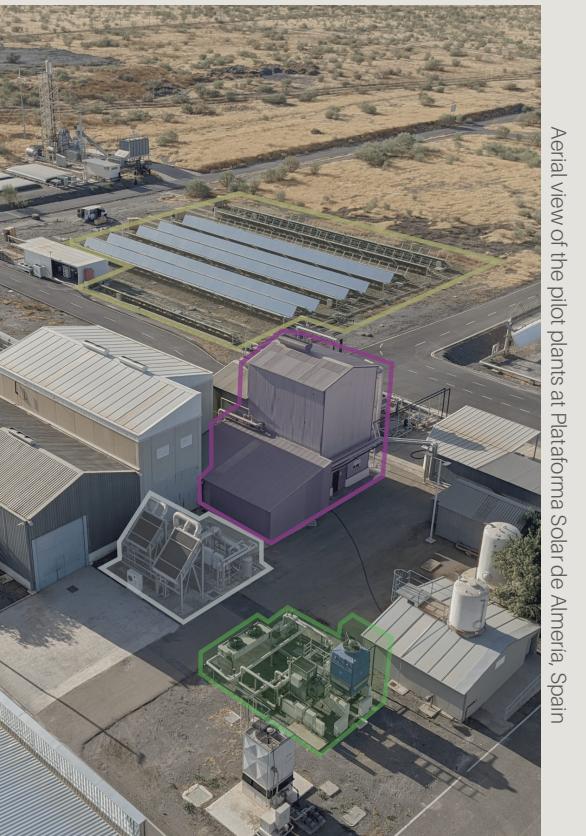
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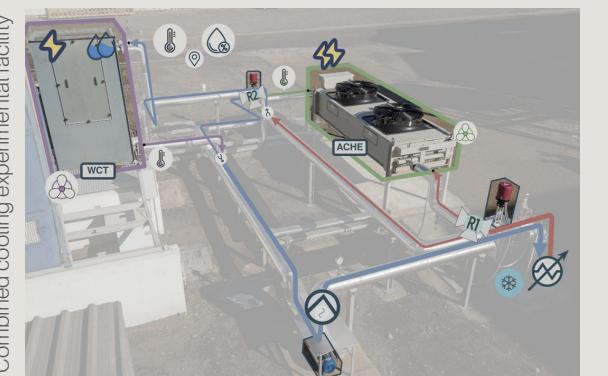
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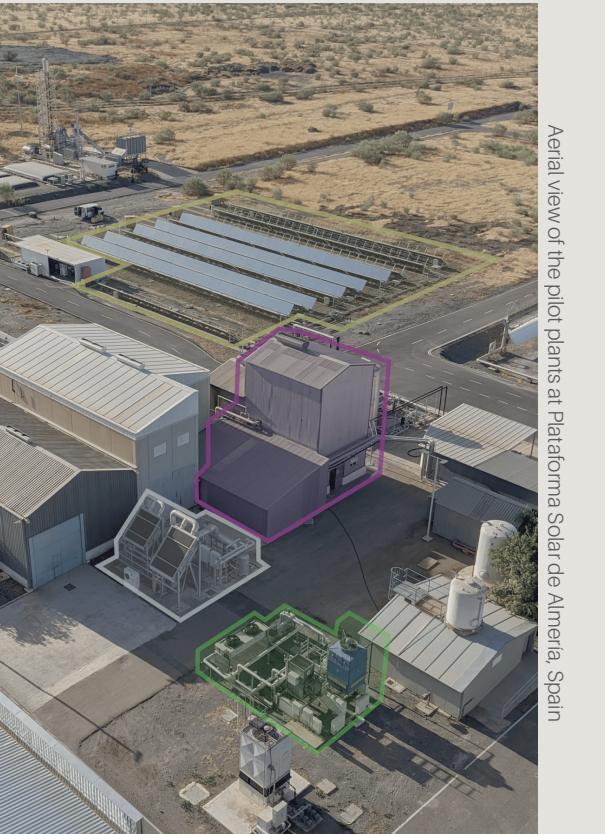
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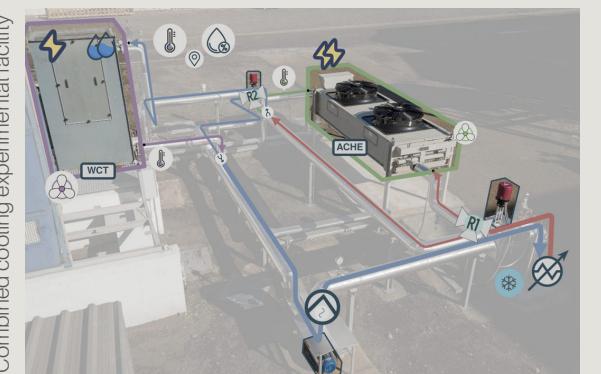
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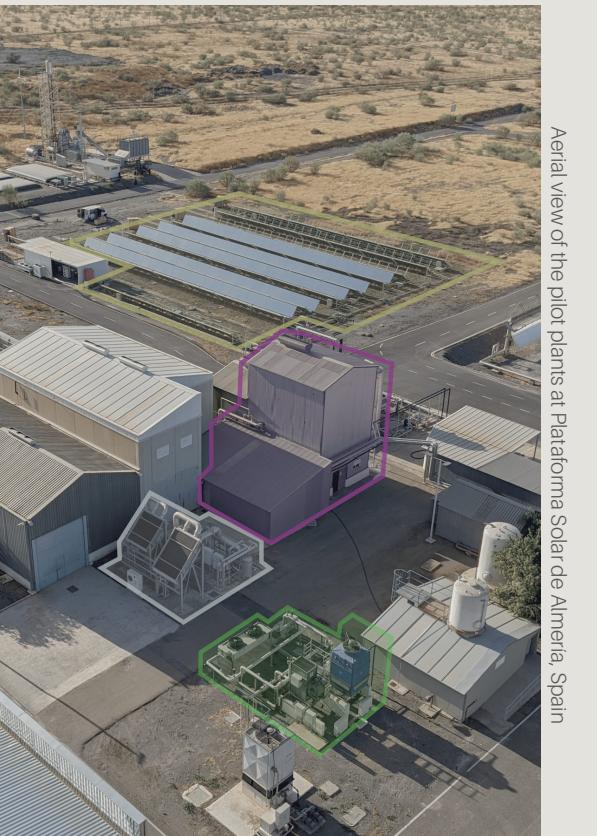
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