

Experimental Exergy Analysis of an Off-Grid Zero Emissions Building

S. Yang, T. Solano, M. Chagas, J. C. Ordóñez, J. V. C. Vargas, T. Davis, C. Ordóñez





Objectives:

1. Perform experimental exergy analysis of the HVAC system in the Off-Grid Zero Emissions Building to identify components with major irreversibilities under dynamic loads.
2. Solar thermal collector and thermal energy storage unit were examined based on the measured temperatures and mass flow rates on different days (i.e., ambient conditions).

Previous Studies

1. Exergy analysis of solar collectors and optimization.
2. Optimize HVAC systems.
3. Predict thermal responses of a building.



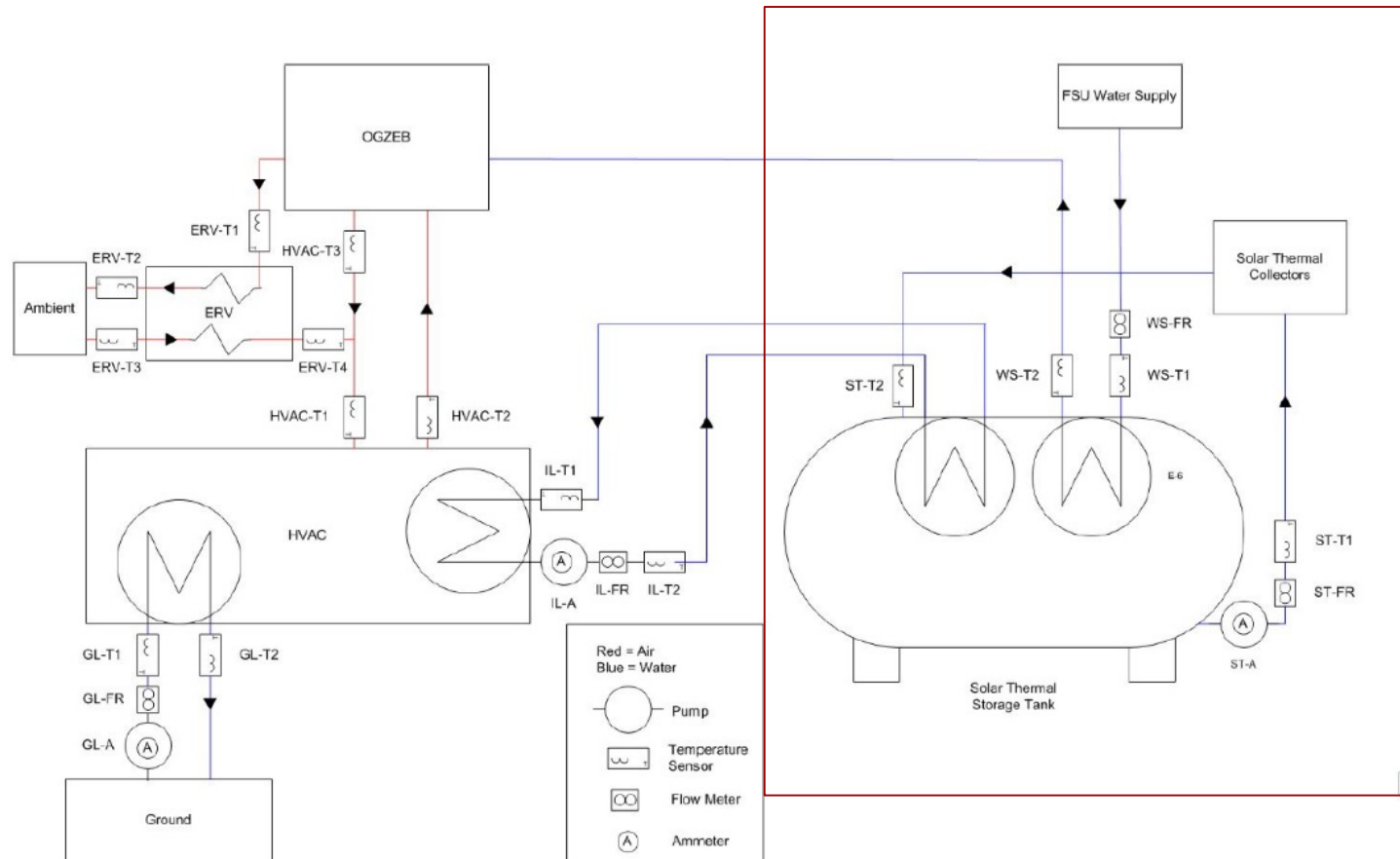
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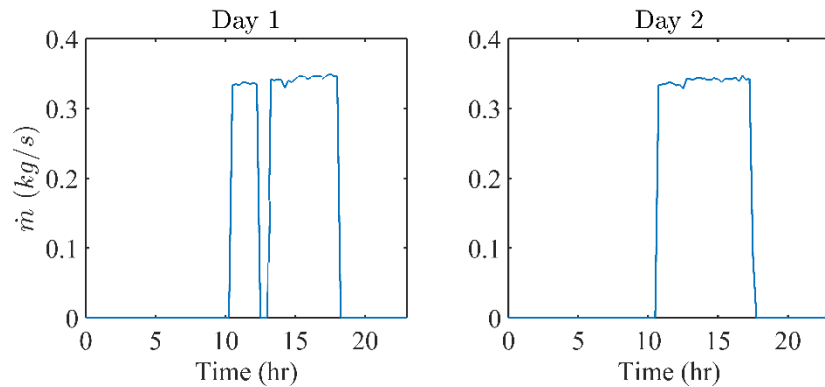


Off-Grid Zero Emissions Building:

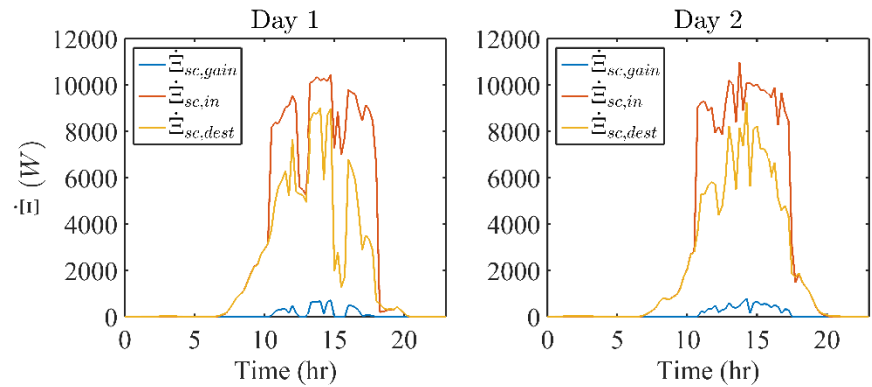


OGZEB HVAC system:

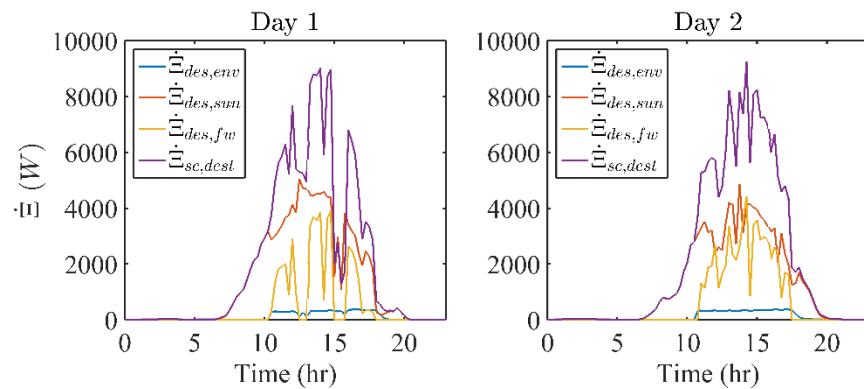




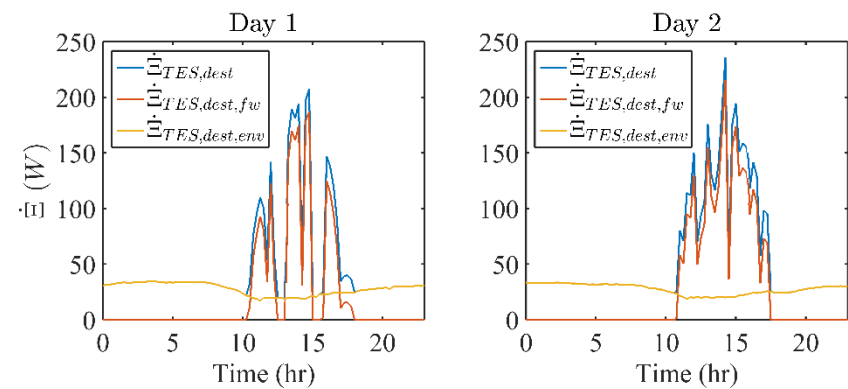
(a) Mass flow rates (demand)



(b) Exergy rates in the collector



(c) Exergy destruction rates
in the collector



(d) Exergy destruction rates
in the TES