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Storing energy for cooling demand management in tropical climates: a technoeconomic comparison between different energy storage technologies

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## ACCEPTED MANUSCRIPT

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5 6	Gabriele Comodi <sup>1,*</sup> , F	rancesco Carducci <sup>1</sup> , Jia Yin Sze <sup>2</sup> , Nagarajan Balamurugan <sup>2</sup> , Alessandro Romagnoli <sup>2,*</sup>	
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16	Nomenclature		
17	CAPEX	Capital cost (\$)	
18	C <sub>cycle</sub>	Cost per cycle (\$/cycle)	
19	CE <sub>2charge</sub>	Cooling energy to be charged ( <i>kWh</i> )	
20		Cooling energy demand ( <i>kWh</i> )	
21	C <sub>eu</sub>	Cost per energy unit (\$/kWh)	
22	C <sub>lp</sub>	specific heat in liquid phase (kJ/kg K)	
23	COP	Coefficient of Performance	
24	$C_p$	specific heat of the storage medium ( <i>kJ/kg K</i> )	
25	C <sub>pu</sub>	Cost per power unit ( <i>\$/kW</i> )	
26	C <sub>sp</sub>	specific heat in solid phase ( <i>kJ/kg K</i> )	
27	Cycles	Lifespan in cycles	
28	Econ_savings	Economic savings (\$)	
29	El <sub>daily</sub>	Daily electricity consumption ( <i>kWh</i> )	
30 21	EN <sub>char</sub>	Energy spend to charge the storage ( <i>kWh</i> )	
31	EN <sub>dis</sub>	Useful energy discharged ( <i>kWh</i> )	
32 22	L	latent heat of fusion ( <i>kJ/kg)</i> mass of the storage medium ( <i>kg</i> )	
33 34	m NODY	number of operative days per year	
35 35	OPT	off peak tariff (\$)	
36	PBP	Payback period	
37	P <sub>req</sub>	Power requirement ( <i>kW</i> )	
38	PT	Peak Tariff (\$)	
39	Q	total amount of energy accumulated during charging/discharging operation (kJ)	
40	SE <sub>capacity</sub>	Storage energy capacity ( <i>kWh</i> )	
41	$T_1$	initial temperature (°C)	
42	$T_2$	final temperature (°C)	
43	T <sub>m</sub>	melting temperature (°C)	
44	V	volume of the storage medium's container $(m^3)$	
45	W <sub>c</sub>	Electrical power required during the liquefaction process by a LAES ( <i>kW</i> )	
46	W <sub>cold</sub>	Cooling power obtained during the discharge process by a LAES ( <i>kW</i> )	
47	W <sub>e</sub>	Electrical power obtained during the discharge process by a LAES ( <i>kW</i> )	
48	ΔΤ	temperature variation of the storage medium (K)	
49	ρ	density of the storage medium $(kg/m^3)$	
50	$\eta_{sto}$	Energy storage efficiency	
51	$\eta_{total}$	LAES total efficiency	

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