

Original Research

Leveraging TRNSYS simulations of a single family house in Spain for renewable energy integration

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Supplementary Materials

Single family house dimensions as designed in SketchUp.

Table S1 SketchUp design dimensions.

Single family house		1st zone	2nd zone	3rd zone
Orientation	Type			
N	wall with windows	67.82	67.20	67.20
N	windows	25.59	7.76	12.31
E	wall with windows	121.31	100.68	100.68
E	windows	46.05	25.86	25.86
S	wall with windows	67.72	67.20	67.20
S	windows	19.25	7.76	7.76
W	wall with windows	118.31	118.91	118.91
W	windows	39.35	39.94	29.41
Zone area (m ²)		451.83	446.87	467.80
Zone volume (m ³)		1926	1963	1933

U-value and convection coefficients.

Table S2 Wall thickness and U-value of all wall types of the buildings.

	Thickness (m)	U-Value (W·m ⁻² ·K ⁻¹)
Single family house		
Ground floor (radiant)	0.395	0.255
Internal walls	0.080	0.519
Internal ceiling (radiant)	0.658	0.214
External wall 1	0.330	0.177
External wall 2	0.370	0.149
External roof 1	0.707	0.155
External roof 2	0.842	0.153
Door	0.000	1.887
Window 1	-	0.520
Window 2	-	0.110
Multi-apartment building		
Ground floor	0.282	0.293
Adjacent ceiling	0.586	0.101
External wall	0.352	0.136
External roof	0.292	0.106
Window	-	0.800

Comparison between TRNSYS type 103b one photovoltaic panel and manufacturer measurements.

Table S3 One photovoltaic panel in laboratory conditions, TRNSYS results vs manufacturer specifications.

	NOCT		STC	
	TRNSYS	Manufacturer	TRNSYS	Manufacturer
Voltage @ MPP (V)	32.60	32.84	34.80	35.25
Current @ MPP (A)	8.06	8.07	10.10	9.93
Power @ MPP (W)	263	265	350	350
Open circuit voltage (V)	39.50	39.31	42.00	42.02
Short circuit current (A)	8.55	8.49	10.60	10.62
Cell temperature (°C)	39.7	45 ± 2	25.2	25